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24TH ANNUAL NATIONAL CONVENTION OF
ASSOCIATION OF PHARMACEUTICAL TEACHERS OF INDIA



SOUVENIR & SCIENTIFIC ABSTRACT

APTICON 2019

THEME: HOLISTIC CONTRIBUTIONS OF PHARMACY GURUS
FOR FUTURE GLOBAL LEADERS – VISION 2047

OCTOBER 11-13, 2019

Certified as Continuous Education Program by Pharmacy Council of India

SUPPORTED BY



ORGANIZED BY

FACULTY OF PHARMACY,
DIT UNIVERSITY, DEHRADUN,
UTTARAKHAND

IN ASSOCIATION WITH

APTI UTTARAKHAND
STATE BRANCH







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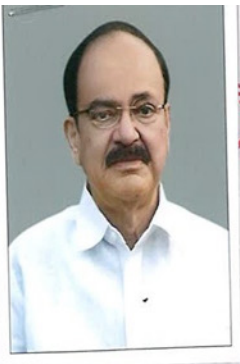
 DITUNIVERSITY.EDU.IN

 +91.79007 88884/5
TOLL FREE 1800 200 4100

 admissions@dituniversity.edu.in

 Mussoorie Diversion Road
Dehra Dun INDIA

BTech BArch BPharm BCA BSc BA BDes Diploma MTech MBA MCA MPharm MSc PhD



रेड्डी, भा.प्रशा.से.
Kumar Reddy, IAS

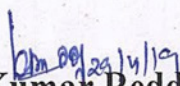


भारत के उप-राष्ट्रपति के निजी सचिव
PRIVATE SECRETARY
TO THE VICE-PRESIDENT OF INDIA
नई दिल्ली / NEW DELHI - 110011
TEL.: 23016344 / 23016422 FAX : 23018124

MESSAGE

The Hon'ble Vice President of India is happy to know that DIT University, Dehradun, is organizing the 24th Annual Convention of Association of Pharmaceutical Teachers of India (APTI) – 2019 on the theme 'Role of Pharmacy Gurus in Bring into Being Global Leaders – Vision 2047' from October 11 – 13, 2019.

The Hon'ble Vice President extends his greetings and congratulations to the students, teachers and staff of DIT University and wishes the event all success.


(D. Prasanth Kumar Reddy)

New Delhi
29th April, 2019.

प्रकाश जावडेकर
Prakash Javadekar



सत्यमेव जयते

मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,
सूचना एवं प्रसारण मंत्रालय
भारत सरकार

Minister

Ministry of Environment, Forest & Climate Change,
Ministry of Information and Broadcasting
Government of India



MESSAGE

It is a matter of pleasure that Faculty of Pharmacy DIT University, Dehradun, Uttarakhand is hosting 24th Annual National Convention of Association of Pharmaceutical Teachers of India (APTICON 2019) on 11th-13th October on very relevant theme "Holistic contribution of Pharmacy Gurus for Future Global Leaders-Vision 2047".

APTICON is a platform where academicians, researchers, students and delegates can exchange their experience, views and research with each other. The profession of Pharmacy is evolving rapidly in this world of globalization and specialization.

It is my pleasure to welcome all the participants and dignitaries in the APTICON-2019 in Dev Bhoomi, Uttarakhand. I am sure that all the delegates will greatly benefited through the deliberations by eminent speakers.

I convey my best wishes for the grand success of this mega event.

Date: 25.09.2019


(Prakash Javadekar)



PHARMACY COUNCIL OF INDIA

(Constituted under the Pharmacy Act, 1948)

Prof. B. Suresh M.Pharm., Ph.D., D.Sc.
President

Combined Councils' Building
Kotla Road, Aiwan-E- Ghalib Marg
P.B. No. 7020, New Delhi-110 002
Phone: 011 23239184, 23231348. Fax: 011 23239184

Pro-Chancellor, JSS University
Sri Shivarathreeshwara Nagar, Mysuru-570 015
Phone: 0821 2548391 Fax: 0821 2548394
sureshbhojraj@gmail.com
sureshjssuni@hotmail.com
www.jssuni.edu.in

July 01, 2019

MESSAGE

It is indeed a matter of pleasure that DIT University, Dehra Dun, Uttarakhand, is organizing the 24th Annual convention of Association of Pharmaceutical Teachers of India, APTI-2019 with the theme "Holistic Contributions of Pharmacy Gurus for Future Global Leaders - Vision 2047" at Dehradun on October 11-13, 2019.

I am sure that the convention will focus on all components of pharmacy education, including innovative teaching and learning strategies, skill development, assessment of educational outcomes, practical tips from seasoned educators and successful approaches to implementation of curriculum revision, as well as topics on attitudes. As pharmacist plays a pivotal role in providing pharmaceutical care services and primary health care, so revival of the pharmacy education in India is the need of the hour which in turn will pave the way for the upgradation of the pharmacy profession in the country.

I am happy that this annual national convention provides an ideal platform for personal and professional grooming, as it brings pharmacy fraternity viz students, researchers, industrial experts and teachers together thus enabling them to discuss, deliberate and invigorate the current issues of education, research and pharmacy profession.

I take this opportunity to convey my best wishes and greetings and wish the convention a grand success.

With best wishes,

Dr. B Suresh
President



PHARMACY COUNCIL OF INDIA

(Constituted Under The Pharmacy Act, 1948)

Dr. Shailendra Saraf

Vice - President
Pharmacy Council of India
Combined Councils' Building
Kotla Road, Alwan-E-Ghalib Marg
New Delhi-110 002
Phone : 011-23231348
Fax : 011-23239184
Website : www.pci.nic.in

No. PRSU/UIOP/2019-20/Q

Professor
University Institute of Pharmacy
Dean, Faculty of Technology (FOS.ME.S)
Pt. Ravishankar Shukla University
Raipur 492010 (C.G.)
Phone/Fax : 0771-2262832
Mobile : 98261-50327
E-mail : drshailendrasaraf@gmail.com

03/09/2019

Message

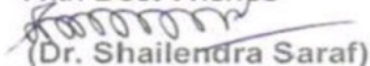
It gives me immense pleasure to note that DIT University Dehradun is hosting 24th Annual Convention of Association of Pharmaceutical Teachers of India APTICON 2019. It is further satisfying to know about the theme - Holistic Contribution of Pharmacy Gurus for future Global Leaders- Vision 2047, a befitting theme and right time to prepare a road map for forthcoming years of this century.

We have experienced very silent dawn of 4th Industrial Revolution, which is an amalgamation of physical sciences, biological sciences and information technology. In this era of 4th industrial revolution the role of all the professionals particularly academicians would be redefined. In order to remain relevant, we the teachers of pharmaceutical sciences have greater responsibility and we are expected to adopt the 4th paradigm shift of teaching and learning that is - Learning, Unlearning and Relearning. I am sure that the participants will churn on all contemporary issues and prepare way forward to harness the great potential to serve humanity and our great nation through contemporary scientific applications.

I congratulate all the stakeholders of DIT University for the accomplishments of 20 years of establishment and my good wishes for future endeavours. I am sure almighty will bless all of us for this festival of Pharmacy being organised during Dussera and Dipawali in the most pious region- Devbhoomi.

My Good wishes for the Grand success of the event.

With Best Wishes



(Dr. Shailendra Saraf)

Professor, University Institute of Pharmacy
Director, IQAC
Pt. Ravishankar Shukla University,
Raipur 492 010 CG

Vice- President
Pharmacy Council of India, New Delhi

डॉ. स. ईश्वरा रेड्डी एम.फार्म, पीएच.डी.
संयुक्त औषधि नियंत्रक (भारत)
केन्द्रीय औषधि मानक नियंत्रण संगठन
स्वास्थ्य सेवा महानिदेशालय
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
भारत सरकार
एफ. डी. ए. भवन, कोटला रोड,
नई दिल्ली-११०००२



सत्यमेव जयते

Dr. S. Eswara Reddy M.Pharm, Ph.D.
Joint Drugs Controller (India)
CENTRAL DRUGS STANDARD CONTROL, ORGANISATION
DIRECTORATE GENERAL OF HEALTH SERVICES
MINISTRY OF HEALTH & FAMILY WELFARE
GOVERNMENT OF INDIA
F.D.A. BHAWAN, KOTLA ROAD,
NEW DELHI-110002

File No: JDC(I)/ER/Misc.-04/2019

Date: 26th Sept. 2019

Message

It is a matter of great pride to know that DIT University, Faculty of Pharmacy is hosting the 24th APTICON 2019 in association with Uttarakhand APTI local branch at its campus at Dehradun, Uttarakhand from 11th to 13th October 2019 with a visionary theme "Holistic Contributions of Pharmacy Gurus for Future Global Leaders – Vision 2047".

This is a need of an hour for the pharmacy profession, as seed to be nourished to bear a sacred fragrance fruit, similarly a budding pharmacist to be nurtured with a talent and professional skills by integrating our ancient system of education so that he will be future professional ambassador for centenary future generations.

The 24th APTICON 2019 will provide an unprecedented opportunity to meet face-to-face with various pharma professionals such as pharmaceutical scientists, academicians, practitioners, pharma-industry professionals and pharmaceutical marketing representatives etc. The said conference will definitely provide useful scientific and technical insight to the delegates of the conference.

I wish the 24th APTICON 2019 a grand success.

Dr. S. Eswara Reddy



सत्यमेव जयते

प्रो. आशुतोष शर्मा

Prof. Ashutosh Sharma



MESSAGE

सचिव
भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
Secretary
Government of India
Ministry of Science and Technology
Department of Science and Technology

25th September, 2019

It is my pleasure to hear that Faculty of Pharmacy of DIT University is organizing 24th Annual National Convention of Association of Pharmaceutical Teachers of India (APTICON 2019) on 11th – 13th October, 2019 in association with APTI Uttarakhand Branch on important theme “Holistic contribution of Pharmacy Gurus for Future Global Leaders-Vision 2047.

APTICON-2019 will provide an platform for the academicians, pharmacists, industrialists and researchers to present their work and exchange their ideas. This conference will have high values on health and awareness agenda at regional, national and global levels for long time. Eminent speakers from around the globe will share their ideas and will help researchers and academicians to overcome barriers in teaching and research.

I congratulate all the men and women who are the part of this conference and send my best wishes for its success.

(Ashutosh Sharma)



UTTARAKHAND STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

उत्तराखण्ड राज्य विज्ञान एवं प्रौद्योगिकी परिषद

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Dr Rajendra Dobhal

FNASc

Director General

Secretary

National Academy of
Sciences India, UK Chapter

Former CMD

National Research

Development Corporation
GoI, New Delhi

VIGYAN DHAM

Vigyan Sadan Block

Dehradun-248 007

Uttarakhand, INDIA

(t) + 91-9412051556/57

(e) dg@ucost.in

drdobhal@gmail.com

डॉ० राजेन्द्र डोभाल

एन.एस.आर.एफ.सी

महानिदेशक

सचिव

राष्ट्रीय विज्ञान अकादमी भारत
उत्तराखण्ड अध्याय

MESSAGE

I am happy to learn that that Faculty of Pharmacy DIT University, Dehradun, Uttarakhand is organizing 24th Annual National Convention of Association of Pharmaceutical Teachers of India (APTICON 2019) on 11th – 13th October, 2019 on the theme, "Holistic Contribution of Pharmacy Gurus for Future Global Leaders-Vision 2047".



Strengthening the current scenario of research on drug development and scientific validation of traditional knowledge system on medicine is inevitable. With increasing threat of global warming on human health, there is an urgent need of coordinated R&D on drug development. I feel that such conferences provide a common platform for crucial discussion among researchers, innovators, academicians of pharma sector.

I extend the warm greetings to the organizers and participants and best wishes for the grand success of APTICON-2019 conference.

With best wishes

(Dr Rajendra Dobhal)
Director General



डॉ. शेखर चि. मांडे

एफएनए, एफएएससी, एफएनएससी

सचिव

वैज्ञानिक और औद्योगिक अनुसंधान विभाग तथा

महानिदेशक

Dr. Shekhar C. Mande

FNA, FASc, FNASc

Secretary

Department of Scientific & Industrial Research and
Director General



भारत सरकार

विज्ञान और प्रौद्योगिकी मंत्रालय

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद

वैज्ञानिक और औद्योगिक अनुसंधान विभाग

Government of India

Ministry of Science and Technology

Council of Scientific & Industrial Research

Department of Scientific & Industrial Research



Message

I am happy to know that 24th Annual National Convention of Association of Pharmaceutical Teachers of India (APTICON 2019) with a theme of "*Holistic contribution of Pharmacy Gurus for Future Global Leaders-Vision 2047*" is going to be held during 11-13 October 2019 at DIT University, Dehradun, Uttarakhand.

The goal of this conference is to bring large number of eminent speakers around the globe to participate in the conference and discuss and share their valuable experiences of research and innovations in the field of pharmacy, drug development and research with teachers, students, researchers from all over the India. The conference will give an opportunity for the participants and students to learn important developments in the field of pharmacy and medicine research through the deliberations of eminent speakers.

I extend my best wishes for the success of APTICON-2019.


[Shekhar C. Mande]

New Delhi
October 01, 2019



Message

Very Warm Greetings to All....

It gives me immense pleasure that Uttarakhand state APTI branch and DIT University, Dehradun are hosting the 24th Annual National Convention of APTI during 11th October to 30th October 2019. The theme of this convention is “Role of Pharmacy Gurus in Bring into Being Global Leaders - Vision 2047”.

In this context, the convention will provide an ideal forum to remember and recall the reminiscences of outstanding pharmacist who are instrumental to layout the foundation of this noble academic body. In fact, the pioneers of APTI had cherished dream to usher APTI to scale new heights. They have also envisioned the promotion and pursuit of excellence and prowess in pharmacy education, research and profession to serve for the cause of community at large. The remarkable contributions, concerted efforts and honest commitments made by the distinguished pharmacy teachers since the inception of APTI till date gives an impetus to aspiring and budding pharmacist in order to develop a road map for the futuristic thinking, to invigorate pharmacy education, research and profession.

In a nutshell, this convention will breed out fruitful discussion, meaningful deliberations, debate and innovative suggestions to explore newer vistas in new age pedagogy, high end research and service to community pharmacy. Last but not the least, dear friends, APTI provides an ideal platform to the pharmacy fraternity to update, upgrade and keep abreast in all possible ways to accomplish its mission.

A handwritten signature in dark ink, consisting of a stylized 'P' followed by several loops and a horizontal line at the end.

Prof. Dr. Pravin D. Chaudhari
President APTI (Central)



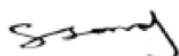
Message

It gives me immense pleasure that Association of Pharmacy Teachers of India is organizing the annual conference on 'Holistic Contributions of Pharmacy Gurus for Future Global Leaders – Vision 2047', 11th-13th October 2019 at Dev-Bhoomi of the country. Now the high time for all pharmacy fraternity to think on this area, analyze, discuss and contribute holistically for development of future pharmacy leaders to cater the need of pharmacists globally. The regulatory body of the country - Pharmacy Council of India, New Delhi has taken the initiative to safeguard pharmacy profession and obligations towards healthcare by releasing the "Pharmacy practice regulation 2015" and its effective implementations. The professional body like APTI of pharmacy profession has to make strategies and planning for continuously educating and skill enhancement of future pharmacists in tune with the mission of prime minister of India for skill development to maintain the leadership.

Looking forward the concrete resolutions will come out from this conference.

I wish organizing secretary, the LOC team, and everyone else connected with APTICON 2019 my best wishes for a successful Conference.

With Warm Regards



Prof. Swarnlata Saraf
Ex-UGC Nominated Member
Pharmacy Council of India, New Delhi



MESSAGE

It's a moment of great pleasure and pride to be a part of 24th Annual National Convention of Association of Pharmaceutical Teachers of India, organized by APTI, Uttarakhand and hosted by DIT University, DEHARADUN. The theme of the Convention **"Holistic Contribution of Pharmacy Gurus for Future Global Leaders – Vision 2047"** is very much sought to be idea, which needs to be implemented for brighter future of the Pharmaceutical sector and of the country.

The great visionary Honourable, **JRD Tata** has rightly said *"No success or achievement in material terms is worthwhile unless it serves the needs or interests of the country and its people and is achieved by fair and honest means"*. In envisioning the future, we need to look at the year 2047—which will be the centenary of Indian independence. As a Pharmacy Teachers we and even our gurus have been imparting pharmacy knowledge and skills into our students at our level best. Over the past few decades Pharmaceutical sector has grown tremendously and is expected to grow more in future. India's Pharmaceutical exports have reached US\$ 19.14 billion in FY19. But unfortunately, US FDA have reported several observations in some of the top Pharma companies during last years. As per IIM studies, the world of the future will belong to innovators and creative conceptualizers rather than narrow specialists working inside their own silos. Our primary concern should emphasize on broadening the identity of the budding Pharmacists. We should make them realize importance of a human being more wholesome. We should aim at students raising as more evolved persons. Thus, we as teachers must start focusing on the core of our humanity as much as the skills. The specific skills required to function in any job can be picked up along the way; the core, on the other hand, relates to the central values of a human being. These values are commitment to truth, sustainability and wholeness. It is this core that we must focus on developing in students. Education must go beyond a transactional system that involves a fixed number of hours' interaction between teacher and student: learning needs to be an ongoing engagement with our whole life, on the lines of the gurukuls of antiquity. Its high time now that for the India to be Future Global Leader, Pharmacy teachers should not only focus on Skill and knowledge but also on the core of our humanity.

We should now understand the importance of coexistence of core human values and moral values like truth, integrity and reality along with the science and technology to evolve as a true responsible Pharmacist, who will be ready to be an inseparable part of India becoming Future Global Leader in 2047. Walking on this path can definitely make entire world to admire our country India. Our mission should be bigger than just disseminating academic or even professional courses. I congratulate APTI and DIT for organizing this 24th APTICON on very much coveted theme. I request all to give their best and play their part in the creation of a new and rising India. I welcome all the Pharmacy teachers, students and delegates around the country to participate and interact in this Annual National Convention of Association of Pharmaceutical Teachers of India and extend my best wishes and greetings to all.

Prof. Milind J. Umekar
Vice President, APTI



Message

It is a moment of Pride for me to write for the Souvenir of 24th APTICON DIT, Dehradun. The Theme is so apt and relates to all our Gurus and their Immense Contributions. This Convention has many Unique Features to name a few: PCI Approved Certification, Highly Esteemed Speakers from round the Globe, Hands on Workshops, E Paper Presentations, Pharma Expo etc.

Dehradun is considered to be the Holy City with so many Dhams and Places of worship. The Delegates can visit many places of their interest. DIT has a wonderful campus and can hold even International Conferences.

The APTI National front has been doing tremendously well for the Teachers welfare. It is standing on all fronts to make and job conditions for Teachers Comfortable. APTI with its awards motivate teachers, the Journals bring insight to their research instinct. Women Forum gives platform to the women to express better.

Let us join hands to unite further and make teachers a still bigger healthy family so that none can harm any of our family members who are contributing extensively as role models for various students. The LOC is leaving no stone unturned and doing a commendable job.

Wishing the entire LOC Good Luck and Best Wishes, APTICON is Shinning. Kudos and Appreciations to the LOC

Thanking you and Regards,



Dr. Raman Dang
Secretary APTI



Message

I am glad to learn that the Faculty of Pharmacy, DIT University is organizing 24th Annual National Convention of Association of Pharmaceutical Teachers of India (APTICON 2019) on 11th – 13th October, 2019 on a highly relevant theme “Holistic contributions of Pharmacy Gurus for Future Global Leaders-Vision 2047”.

APTICON-2019 will provide an excellent platform for the budding pharmacists, teachers, pharmacists, industrialists and researchers from different parts of the country to present their work and exchange their thoughts. I am sure this convention will help the teaching fraternity to overcome the barriers in implementing newer strategies in teaching and research.

I express my best wishes to the organizing committee for the grand success of APTICON – 2019.

Anuj Aggarwal
Chairman, BoG
DIT University, Dehradun



Mussoorie Diversion Road
Dehra Dun - 248 009
Uttarakhand INDIA
Phones +91.135.3000 300, 301
FAX +91.135.3000 309
E-mail: dit@dituniversity.edu.in



Message of Chancellor

It gives me great pleasure to know that the Faculty of Pharmacy of DIT University is hosting a gala pre Silver Jubilee APTICON 2019 Convention, in association with Uttarakhand State APTI Branch. This Conference is a prime platform to explore the futuristic skills of pharmacists; so that they can be a witness to the emergence of next generation professionals. I wish that this gathering will provide a futuristic road map for pharmacy education to enable policy makers set the platform for globalization of pharmaceutical educational standards.

I welcome all dignitaries and delegates to the 24th APTICON. My best wishes for the success of the event.

N. Ravi Shanker.

(N. Ravi Shanker)



Date: 18.09.2019

MESSAGE

It gives me immense pleasure to know that 24th Annual National Convention of Association of Pharmaceutical Teachers of India (APTICON 2019) on 11th – 13th October, 2019 is being organized by Faculty of Pharmacy DIT University, Dehradun, Uttarakhand.

The theme of the Convention “Holistic contribution of Pharmacy Gurus for Future Global Leaders-Vision 2047” is very pertinent. I am looking forward with great hope that this conference will proceed in realizing its noble theme.

APTICON is a platform where academicians, researchers, pharmacists, students and delegates can exchange their experiences, views, ideas and research findings on novel concepts, techniques and methods of pharmaceutical field.

It is my pleasure to welcome all the participants and dignitaries in the APTICON-2019 in Dev Bhoomi, Uttarkhand. I am sure that all the delegates will greatly benefited through the deliberations by globally eminent speakers.

I extend my best wishes and greetings for the grand success of this event.

Prof. (Dr.) K.K. Raina
Vice Chancellor
DIT University, Dehradun

Office of the Pro-Vice Chancellor

It is indeed a proud moment and a great honour to host the 24th Annual National Convention of Association of Pharmaceutical Teachers of India at our University. This convention is scheduled appropriately with the intent to address the theme of “Holistic Contribution of Pharmacy Gurus for Future Global Leaders – Vision 2047”.

The theme, I am sure would invoke thoughtful discussion and encourage all participants to contribute towards the Global perspective and our National Interest in this field. The congregation of eminent speakers both of National and International fame would indeed result in exchange of ideas and immense networking. Ultimately, this would help in developing a potent policy with achievable targets.

I congratulate the organizing committee and all members of Association of Pharmaceutical Teachers of India for their concerted efforts in consolidating their visionary proposals. Our best wishes for a productive and intriguing discussions for memorable outcomes.



*Brigadier (Dr) M Srinivasan (Retired)
Pro Vice Chancellor*



Chairperson
APTICON-2019

MESSAGE

It gives me an immense pleasure to state that we at DIT University-Faculty of Pharmacy, got an opportunity to host 24 pre Silver Jubilee APTICON - 2019 in association with Uttarakhand APTI branch at Devbhoomi. The theme of the convention is **“Holistic contributions of Pharmacy Gurus for future global leaders with a centenary vision 2047”**.

This convention provides an unique platform to all professional experts, regulatory authorities, scientists, researchers from national and international repute to share their valuable novel thoughts and research updates through expert lectures and workshops to the professional and budding professional gathering.

This convention also offers a venue for deliberations on global best education practices, our ancient Indian education systems and holistic contribution of Pharmacy gurus which leads to directives for both current education system and forthcoming generations. On behalf of Local organising committee our best wishes to all for making this convention grand gala success.

Prof. (Dr.) N.V. Satheesh Madhav
Chairman
Local Organizing Committee-APTICON 2019
Director, Faculty of Pharmacy
DIT University, Dehradun



General Secretary
APTICON-2019

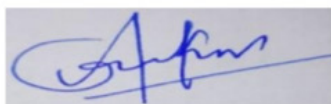
Message

It is a matter of pride and great pleasure to have this opportunity to welcome you all to 24th APTICON to be held in DIT University on 11 to 13th October 2019. It will provide a unique platform for scientific discussions among the Pharmacy Teachers, Entrepreneurial Scientists and Students.

The theme for the APTICON “**Holistic Contributions of Pharmacy Gurus for Future Global Leaders – Vision 2047**” aptly summarizes the conference.

Heartfelt gratitude is extended to APTI for providing us with the opportunity to organize this event and for all the support and encouragement, which have come a long way in framing this event.

I hope that the collaborative and constructive deliberation by the renowned Teachers and researchers will be fruitful for the professionals.



Dr Arun Chaudhary
General Secretary APTICON 2019
President APTI Uttarakhand



**Organizing Secretary
APTICON-2019**

MESSAGE

On behalf of the Local Organizing Committee of Association of Pharmaceutical Teachers of India, 24th Annual National Convention, Dehradun scheduled from 11-13th October, 2019, I extend a hearty welcome to you all. The theme of the convention “Holistic Contribution of Pharmacy Gurus for Future Global Leaders – Vision - 2047” is well crafted in context with its hosting Devbhoomi state and integrate the Indian traditional educational values to modern pharmaceutical science with a vision on 100 years independence celebration.

We are sure that the well-chosen speakers all around the world will share their experiences and mantras with every participant becoming the quality researcher and effective teacher. The convention provides the most ideal platform to exchange views, share research outcomes, learn the new research concepts, skill with emerging teaching methodologies, develop a professional approach and experience multifaceted pharmacy practitioner life style.

I appreciate the Pharmacy Council of India for recognizing this event under Continuous Education Program (CEP) and extending the financial support. On behalf of LOC, I would extend my heartfelt thanks to all the sponsors of the event and also overwhelmed support from academia and industries from Uttarakhand State in hosting the event. I also thank our patrons, LOC members, volunteers, chairpersons, resource persons, delegates, press and media and others for putting their full efforts to make this convention most memorable.

Dr. Havagiray R. Chitme
Organizing Secretary- APTICON - 2019
HOD, Faculty of Pharmacy, DIT University



Convener
APTICON-2019

Message

I extend a hearty welcome to all delegates, teacher and colleagues to participate in the APTI convention at DIT University, Dehradun on 11th-13th October 2019 on behalf of local organizing committee and APTI Uttarakhand State Branch.

Association of Pharmaceutical Teachers of India is the national association of pharmacy teachers and is in official relations with the Indian Pharmaceutical Congress Association (IPCA). Through its nearly 10,000 members, APTI represents and serves more than 400,000 students and Research Scholars around the country every year. Recognizing this fact, APTI has developed a new Vision, Mission and Strategic plan with the goal of firmly integrating the association to strengthen its activities for the advancement and development of teaching community.

The main goal of organizing this conference is to share and enhance the knowledge of each and every individual in this pharmacy world. The conference aims to bridge the researchers working in academia and other professionals through poster presentations, research presentations and keynote addresses in current technological trends. You will get ample opportunities to widen your knowledge and network. Outside of the conference, I hope that you will enjoy some of the many attractions found in and around our beautiful DIT University campus. Such a large conference event is the culmination of many individuals. I thank the conference committee for extending their valuable time in organizing the program and all the authors, reviewers, and other contributors for their sparkling efforts and their belief in the excellence of APTICON2019.



Dr Rajeev Kumar Sharma

Convener APTICON 2019

Vice president APTI Uttarakhand



Chairperson
Souvenir Committee
APTICON-2019



Convener
Scientific Committee
APTICON-2019

MESSAGE

We are delighted to welcome all delegates, participants in the 24th Annual National Convention of APTI from 11-13th October, 2019 in DIT University, Dehradun, Uttarakhand. DIT University is celebrating the completion of 20 years of excellence in technical education. The theme for the convention '*Role of Pharmacy Gurus in Bring into Being Global Leaders - Vision 2047*' is derived in consideration of Devbhoomi location and the centenary celebration of Indian independence.

The annual convention provides a common platform to discuss and deliberate upon standards and new technological methods in pharmacy education through the exchange of views amongst National and International academicians, scientists, industry consultants, research scholars and students. 24th convention is expected participation of delegates from all over India. Our prime objective of the conference is to ignite invention skills in pharmacy professionals and young scientists and other stakeholders by providing knowledge through eminent lectures and workshops.

We would extend our heartfelt thanks to all the sponsors of the event, our patrons, LOC committee members, student volunteers, academicians, pharmacists, industrialists, delegates, media etc for overwhelmed support and participation in the convention. I am sure this conference run in the spirit of open communication among all participants and yield scientific innovation profit to all of the participants so that this convention will contribute for promoting the pharmacy profession to reach global Excellency.

Dr. Manmohan Singhal
Chairperson- Souvenir Committee
APTICON – 2019
Faculty of Pharmacy,
DIT University, Dehradun

Dr. Harish Chandra
Convener- Scientific Committee
APTICON – 2019
Faculty of Pharmacy,
DIT University, Dehradun

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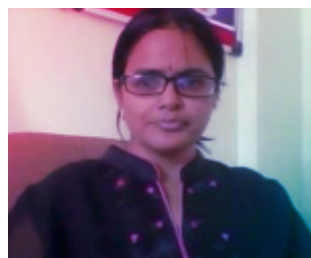
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Srinagar



Dr. Yogita Dobhal
Associate Professor, SPSAC
SBS University, Dehradun

Faculties contributed immensely for APTICON-2019

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EXHIBITION,
CONVENER



Mr. Samir Bhargava
MEDIA, PRINT, PUB.,
CONVENER



Miss. Farheen
LADIES HOSPITALITY,
MEMBER

Programme Schedule

FRIDAY, 11TH OCTOBER 2019

PRE-CONVENTION WORKSHOPS

10:00-11:30

Workshop – I



SEMINAR ROOM 101
VISHWESHWARAYA
BUILDING

*Innovation and Knowledge Exchange in Academic set-ups:
Challenges and Opportunities*

Prof. Anant Paradkar

Interdisciplinary Chair in Pharmaceutical Engineering
Science, University of Bradford, UK

10:00-11:30

Workshop – II



SEMINAR ROOM 105
VISHWESHWARAYA
BUILDING

Patenting of Pharmaceutical Inventions

Dr. Sharana Gouda

Group Leader-Biotechnology Division, The Patent Office,
Government of India, Chennai

10:00-11:30

Workshop – III



SEMINAR ROOM 201
VISHWESHWARAYA
BUILDING

Active Learning in Pharmacy Education Using Technologies

Dr. Mohammad Isreb

Lecturer in Clinical Pharmaceutics
Bradford University, UK

12:00-13:00

LUNCH

13:00-15:00

Workshop – IV



SEMINAR ROOM – 105
VISHWESHWARAYA
BUILDING

*Writing research grant application to National and
International Funding Agencies*

Dr. Neeraj Mahendroo

School of Pharmacy, Monash University Malaysia



Programme Schedule

FRIDAY, 11TH OCTOBER 2019

PRE-CONVENTION WORKSHOPS

13:00-15:00

Workshop – V



SEMINAR ROOM 101
VISHWESHWARAYA
BUILDING

*Writing Scientific Articles for Publication in
High Impact Journals*

Prof. Rajender R. Aparasu

Chair, Department of Pharmaceutical Health Outcomes
and Policy, University of Houston, Houston, Texas USA

10:00-11:30

Workshop – VI



SEMINAR ROOM 201
VISHWESHWARAYA
BUILDING

*Best Practices for OSCE as an Effective
Student Learning Assessment*

Dr. Aanadi V. Law

Associate Dean for Assessment, and Professor, Western
University of Health Sciences College of Pharmacy,
Pomona, California

15:00-16:00

APTI Executive Council Meeting, Board Room, Vedanta

16:00-20:30

Inaugural Session & Award Ceremony, Auditorium, Vedanta

20:30-22:00

Cultural Program, Auditorium, Vedanta. GALA Dinner

SATURDAY, 12TH OCTOBER 2019

PLENARY SESSIONS

9:00 - 9:40

**Plenary
Session I**



AUDITORIUM
VEDANTA BUILDING

KLE ORATION LECTURE

Topic: Achieving translation through interdisciplinary research

Speaker: Prof. Anant Paradkar

Interdisciplinary Chair in Pharmaceutical Engineering
Science, University of Bradford, UK

9.50 - 10:30

**Plenary
Session II**



AUDITORIUM
VEDANTA BUILDING

DR. G. BHAGWANT MEMORIAL
LECTURE

*Topic: Emerging Models of Pharmacy Practice in the US:
Moving towards Direct Patient Care*

Speaker: Dr. Anandi V. Law

Associate Dean for Assessment, and Professor, Department
of Pharmacy Practice and Administration at Western
University of Health Sciences College of Pharmacy,
Pomona, California

10.40 - 11:20

**Plenary
Session III**



AUDITORIUM
VEDANTA BUILDING

ML SCHROFF MEMORIAL LECTURE

*Topic: Real World Evidence: Research Skills and Opportunities
to Improve Patient Outcomes*

Speaker: Prof. Rajender R. Aparasu

Chair, Department of Pharmaceutical Health Outcomes
and Policy, University of Houston, Houston, Texas USA

11.30 - 12:10

**Plenary
Session IV**



AUDITORIUM
VEDANTA BUILDING

GP SRIVASTAVA MEMORIAL LECTURE

Topic: Qualities and Capabilities of Future Pharma Gurus

Speaker: Dr. Swarnlata Saraf

Principal University Institute of Pharmacy, Pt.
Ravishankar Shukla University, Raipur, Chhattisgarh

SATURDAY, 12TH OCTOBER 2019

PLENARY SESSIONS

12.10 - 13.00

**Plenary
Session V**



AUDITORIUM
VEDANTA BUILDING

54TH IPC TRUST SPONSORED LECTURE

*Topic: Teaching Innovations to accept Challenges of
Growing Pharmacy Profession*

Speaker: Dr Mahesh Burande

Hon. Director, Institute of Pharmaceutical Education &
Research, Pune

13:00 - 14:00

LUNCH

14:00 - 14:40

**Plenary
Session VI**



AUDITORIUM
VEDANTA BUILDING

*Topic: Inhibition of DNA Repair as a
strategy to treat Cancer*

Speaker: Prof. Sathees C. Raghavan

IISc, Bangalore

14.40 - 15.20

*Topic: Need of Foundation Program in Higher
Education System of Non-English Speaking Countries*

Speaker: Dr. Yaseen M. Al Lawatia

Dean, School of Foundation Studies, National University
of Science & Technology, Muscat – Oman

15.20 - 16.00

Topic: Impact of Pharmacogenomics in Asians

Speaker: Prof. Gan Siew Hua

Head, School of Pharmacy,
Monash University Malaysia

16.00 - 16.40

*Topic: Regulatory role of HCMV miRNAs
in cellular Apoptosis*

Speaker: Dr Sunil Babu Gosipatala

Department of Biotechnology School for Biosciences &
Biotechnology Babasaheb Bhimrao Ambedkar University
Lucknow- Uttar Pradesh

SATURDAY, 12TH OCTOBER 2019

16.40 - 17.00

Discussion

 AUDITORIUM
VEDANTA BUILDING

9:30 - 11:30

Oral Presentation

 CLASS ROOM 1-5
VISHWESHARAYA
BUILDING

9:30 - 17:30

E-Poster Presentation

 STUDIO 1 & STUDIO 2,
VASTU BUILDING

SUNDAY, 13TH OCTOBER 2019

9:00 - 9:30

Plenary Session VII

 AUDITORIUM
VEDANTA BUILDING

*Topic: Recent Developments in Medicinal Chemistry
and Challenges in Developing Low Cost Haemodialysis
Cartridges*

Speaker: Dr. Arun Mohan Isloor

Professor, National Institute of Technology, Suratkal,
Mangalore, Karnataka

9:30 - 10:00

*Topic: Research-Teaching Nexus is the Need of Hour in
Pharmacy Education*

Speaker: Dr. Jayasekhar P

Professor & Chair, College of Pharmacy, National
University, Muscat – Oman



SUNDAY, 13TH OCTOBER 2019

10:00 - 10:30

Plenary Session VII



AUDITORIUM
VEDANTA BUILDING

Topic: Tacrolimus dosage selection depending on genetic profile: a personalized medicine approach

Speaker: Dr. Radhakrishnan R. Nair

10:30 - 11:00

Topic: Drug Repurposing: A Novel way of drug development

Speaker: Dr. R. K. Dixit

Prof. of Pharmacology, KGM University, Lucknow

11:00 - 11:10



AUDITORIUM
VEDANTA BUILDING

Discussion

11:10 - 11:40

Plenary Session VIII



AUDITORIUM
VEDANTA BUILDING

Topic: HEOR and Decision-Markes Healthcare Decision Making

Speaker: Dr. Varun Vaidya

Director Graduate Programs Health Outcomes and Socioeconomic Sciences, University of Toledo, Toledo, USA

11:40 - 12:10

Topic: Importance of GLP in Drug Development –Case Studies

Speaker: Dr. Nagaraj N.

Head – Medical Writing and Biopharmaceutics, Axis Clinicals Ltd., Hyderabad

12:10 - 12:30



AUDITORIUM
VEDANTA BUILDING

Discussion

SUNDAY, 13TH OCTOBER 2019

12:30-13:30

APTI Annual General Meeting



AUDITORIUM
VEDANTA BUILDING

13:00-14:00

LUNCH

14:00-15:00

Book Release, Prize distribution and Valedictory Function

10:00-12:30

Meet and Greet Your Professor



CHARAK,
PHARMACY
BLOCK

Prof. Anant Paradhkar,
Bradford University, UK

Prof. Anandi V. Law,
Western University of Health Sciences, California

Pro. Rajendra Aparasu,
University of Houston, Houston, Texas USA

Prof. Yaseen M. Al Lawatia,
Nat. Univ. of Sci. Tech. Muscat, Oman

Prof. Satheesh C. Raghavan,
IISc, Bangalore

Prof Gan Siew Hua,
Monash University Malaysia



APTICON 2019 **Speakers**



Prof. Anant Paradkar

**INTERDISCIPLINARY CHAIR IN PHARMACEUTICAL
ENGINEERING SCIENCE, UNIVERSITY OF
BRADFORD, UK**

Professor Anant Paradkar holds an Interdisciplinary Chair in Pharmaceutical Engineering Science and is Director of the Centre for Pharmaceutical Engineering Science. He completed his PhD in Pharmaceutics and joined Bradford following a 20-year academic career in India. He has worked on various interdisciplinary collaborative research projects in the areas of process development and crystal and particle engineering, developing techniques such as crystallo-co-agglomeration, melt granulation, sono-crystallisation, spray drying of low Tg materials and liquid crystal precursors. He is currently working on the application of hot melt extrusion and sono-crystallisation to generate co-crystals and has been awarded an EPSRC funding and Yorkshire Enterprise Fellowship to strengthen exploitation and impact of this work. In India, he received research funding from the All India Council for Technical Education, University Grants Commission, Department of Science and Technology and the Ministry of Defence. He has received an India-JSPS International Joint project on liquid crystalline systems, UK-India Education and Research Initiative (UKIERI) Fellowship and a Royal Society UK-India Science Network award. He has supervised 10 PhD and 45 MPharm candidates and published over 90 research papers. Currently, he is supervising/ co-supervising 15 PhD students in various areas of research.



Prof. Sathees C. Raghavan

IISC, BANGALORE

Dr. Raghavan obtained his PhD from Banaras Hindu University, India and then went on to do his postdoctoral research from the University of Southern California, USA. His research group at IISc focuses on deciphering mechanism of genomic instability in leukemia and lymphoma. Besides, his group also explores the role of immune system in the genesis of chromosomal abnormalities, DNA repair and cancer therapeutics. He has published over 125 research articles in internationally peer-reviewed journals, and has obtained several patents. Dr. Raghavan is the recipient of several awards including Shanti Swarup Bhatnagar prize (2013), Leukemia Research Foundation (USA), Kobayashi Foundation Award (KFA), 2016, NASSI-Reliance Industries Platinum Jubilee Award (2015). He is also a "Fellow" of National Academy of Sciences, Allahabad and Indian Academy of Sciences, Bangalore. He is currently an Editor of FEBS Journal, UK.

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Prof. Gan Siew Hua

**HEAD, SCHOOL OF PHARMACY, MONASH UNIVERSITY
MALAYSIA**

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Gan obtained her undergraduate degree in pharmacy from Manchester University, England and subsequent higher qualifications (M. Pharm and PhD) from Universiti Sains Malaysia (USM). Upon completion of her PhD in 2003, she joined the Medical School in USM and headed the Pharmacology Department (Dec 2007-Jan 2009). Subsequently she became the Director of Human Genome Centre (Mac 2009- Jan 2013) before being promoted to a Professor (2014). She joined Monash University Malaysia as a Professor in Pharmacy in Jan 2018 after serving in USM for 18 years. Gan has received various fundings from national and international agencies including WHO, TWAS-COMSTEC (UNESCO), e-science, FRGS, Research University (RU) (Team), RU (individual), APEX Delivering excellence, Dana Inova-si Awal, Industrial, short term and Research. She has successfully supervised 15 PhD and 3 MSc students. She has published more than 200 WOS-indexed papers with more than 60% of papers and more than 10 books. Gan serves on the editorial board of several journals such as Seminars in Cancer Biology, Frontiers in Pharmacology, PlosOne journal, International Journal of Hypertension, Current Chemical Genomics & Translational Medicine, World Journal of Medical Genetics and Evidence-Based Complementary Alternative Medicine. Gan is a life member of Malaysian Pharmaceutical Society, Malaysian Natural Products Society and Malaysian Society of Infectious Disease & Chemotherapy. She is also a member of Association Clinical Biochemist, Malaysian Society for Biochemistry & Molecular Biology, Malaysian Society of Pharmacology & Physiology, Institute of Food Technologists, Human Genome & some other prestigious organizations.



Prof. Rajender R. Aparasu

DEPARTMENT OF PHARMACEUTICAL HEALTH
OUTCOMES & POLICY, UNIVERSITY OF HOUSTON,
TEXAS USA

Dr. Aparasu is Professor and Chair at University of Houston - College of Pharmacy. He started his academic career at South Dakota State University - College of Pharmacy in 1995 after obtaining his PhD from the University of Louisiana - Monroe. He joined the University of Houston - College of Pharmacy in 2006. He has trained over have 20 graduate students and post-doctoral fellows. His research focuses on quality of pharmacotherapy issues in the elderly. His current federally funded research is evaluating safety profiles of antimuscarinic agents in the elderly with dementia. He is a peer reviewer for numerous pharmacy and medical journals with over 150 national/international presentations and more than 100 peer-reviewed publications and has been recognized as an Exceptional Peer Reviewer by prestigious pharmacy and healthcare journals. Dr. Aparasu is the Editor-in-Chief for Drug, Healthcare and Patient Safety and serves on editorial boards of journals like Research in Social and Administrative Pharmacy and Drugs and Aging. He served as co-chair of the Research Review Committee for the Annual International Meeting of the International Society of Pharmacoeconomics and Outcomes Research (ISPOR) in 2016. He has been co-chair of Houston Medication Safety Symposium for past few years. He has edited two textbooks, Research Methods for Pharmaceutical Practice and Policy (by Pharmaceutical Press, UK)



Dr. R. K. Dixit

PROF. OF PHARMACOLOGY KGM UNIVERSITY,
LUCKNOW, UTTAR PRADESH

Dr. Dixit is currently working as Professor at Department of Pharmacology & Therapeutics, King George's Medical University from 13th March 2010. Formerly he worked as Associate professor, Assistant professor at KGMC, Senior Resident at Dept. of pharmacology & Therapeutics PGIMER Chandigarh from Jan 1998 to Jan 2001. He is Postgraduate teacher recognized from MCI for P.G., M.B.B.S., B.D.S., M.D.S., M.Phil and Ph.D. He completed his M.D. and MBBS from G.S.V.M. Medical College Kanpur (Kanpur University, Kanpur) in 1997 and 1994 respectively. He has published 159 research papers, 37 review articles, book on MCQs on Pharmacology.

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Dr. Sunil Babu Gosipatala

DEPARTMENT OF BIOTECHNOLOGY SCHOOL FOR BIOSCIENCES & BIOTECHNOLOGY
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY LUCKNOW-UTTAR PRADESH

Dr. Gosipatala is currently working as Assistant Professor at Department of Biotechnology, BBAU, Lucknow. He completed his M.Sc and PhD from Andhra University, Visakhapatnam, AP, India. His lab is primarily engaged in unraveling the viral miRNAs role in establishing the latency and survival in the human body. Viral miRNAs are of great interest as they help the virus in both the lytic and latent phases and also survival of virus in the hosts, by regulating the viral as well as host biological pathways. He has been also served as Reader and Lecturer at Department of Biochemistry, Bundelkhand University, Jhansi, Uttar Pradesh. He has been received several awards and honors.



Dr. Arun Mohan Isloor

PROFESSOR, NATIONAL INSTITUTE OF TECHNOLOGY,
SURATKAL, MANGALORE, KARNATAKA

Currently, Dr. Arun is Professor and heading the Department of Chemistry, National Institute of Technology-Karnataka, Surathkal. He completed his postdoctoral studies at Technion-Israel Institute of Technology and has more than 16 years of academic and research experience. His current research area of interest are Membrane Technology, Medicinal Chemistry, organic Electronics, Nanomaterials, X-ray, crystallography etc. He has published more than 235 research papers and holding two US patents and filed three patents in India, US and Malaysia. He guided 17 students for their Ph.D (Currently 6 more working) and published two books. He has been worked as Visiting Scientist at, University Sriwijaya-Indonesia during October 2018, University of Toronto-Canada during February 2018, Universiti Teknologi Malaysia (Since last 07 years, 14 visits made), Technion Israel Institute of Technology during May-June 2008, School of Physics, Universiti Sains Malaysia during June 2010, University of Waterloo-Canada October 2016 and NTU Singapore during June 2013. He has been received many awards as SIR C.V. RAMAN YOUNG SCIENTIST STATE AWARD in Chemical Sciences on AUGUST 6th 2018. Awarded by Chief Minister of Karnataka, selected for the award of 'Centre of excellence' in Membrane research by VGST, Govt of Karnataka during December 2014 for amount Rs 60.00 Lakhs, Within Top 5 Researcher in India (Materials Research) as per the SCOPUS survey held during March 2014

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Dr. Swarnlata Saraf

**UNIVERSITY INSTITUTE OF PHARMACY, PT.
RAVISHANKAR SHUKLA UNIVERSITY, RAIPUR,
CHHATTISGARH**

Dr. Swarnlata Saraf is currently serving as Professor at University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur India. Her field of specialization is Pharmaceutics and Research area of interest includes herbal formulations, Drug delivery and exploring targeting aspects of novel phyto-formulations. She has expertise in developing phyto-formulations and passion in improving well-being of the society. She gains this experience by continuous and consistent efforts of her work in cosmetic and drug delivery laboratories in the institute. She is associated with many national apex bodies like NAAC, UGC, PCI, AICTE, and CRS as member and as an expert in different committees. She also served as an expert of grant evaluator of Israel Science foundation. Her Innovated Technology for Value edition to existing herbs in Chhattisgarh & engaged in promotional activities like Promotion of Janaushadi Kendra by dept. of family welfare, Govt. of India, Regular Interaction with pharmacists. She is also involved in awareness programmes through Shakti-Vigyan Bharati relating to health & hygiene, Sustainable development and education for women, Regular activities are organized to aware people. She has guided over 15 PhD and 30 PG students.



Dr. Radhakrishnan R. Nair

**HEAD, LABORATORY MEDICINE & MOLECULAR
DIAGNOSTICS, RAJIV GANDHI CENTRE FOR
BIOTECHNOLOGY. GOVT. OF INDIA**

Dr. Radhakrishnan. R. Nair, Scientist EII & Head, Laboratory Medicine & Molecular Diagnostics, Rajiv Gandhi Centre for Biotechnology. He is also serving as Chairman, Board of Studies, (Medical Biochemistry), Kannur University, Kerala. Through LMMD he has taken initial steps to pervasive its diagnostic services in and around Kerala. LMMD is the only lab of its kind in India that performs more than 50 parameters under one roof. The lab knobs both diagnostics and research equally. Currently LMMD has two ongoing projects; Development of lateral flow device for species identification of snake bite and subsequent development of portable reader for payload quantification.

Formulation of a predictive marker of drug metabolism through a pharmacogenomics approach to alleviate Tacrolimus-induced undesirable effects on transplant recipient.

Following are his selected recent publications: Comparative study of molecular approaches for the detection of Influenza virus from patient samples using real-time PCR- prospective disease burden study in Kerala (India) from 2010 to 2016. Infectious Disease Reports, June 2018. Whole- Genome sequence of Influenza A (H1N1) pdm09 virus Isolates from Kerala, India, American Society for Microbiology, 2017. Development of a multiplex RT-PCR for simultaneous diagnosis of human metapneumovirus (HMPV) and HRSV from clinical specimens, Springer, 2016.

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Dr. Yaseen M. Al Lawatia

DEAN, SCHOOL OF FOUNDATION STUDIES NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY, MUSCAT – OMAN

Dr. Yaseen Moosa Al Lawatia, Vice Dean, Premed and Pharmacy Program- Oman Medical College and Dean, School of Foundation Studies & Advisor, International Relations Office, National University of Science & Technology, Muscat - Sultanate of Oman. Dr. Yaseen received his doctorate in 1995 from the University of Starthclyde (UK) in Microbiology, after which he was offered a teaching position at the Sultan Qaboos University, college of medicine, in the department of Microbiology. He served in this position for a period of 15 years during which he was teaching the medical students as well as students in the medical laboratory science program and in the College of Nursing. He also held various responsible positions during his tenure at SQU such as, Assistant Dean for Academic Affairs also in charge of the elective program, supervisor of student activities, convener of workshops on academic advising. In 2007 got the scholarship for Postdoctoral at Manchester University. In 2009, Dr. Yaseen was appointed as the Associate Dean for Academic Affairs at Oman Medical College and in 2014 he was promoted as the Vice Dean of the pharmacy, premed and General Foundation Program which are now under the umbrella of National University of Science & Technology. Dr. Yaseen was elected as a member of the OQNHE- Oman Quality Network in Higher Educational Institutions, he served in the organizing committee for four years and as a treasurer for two years. He is a pioneer in the area of student support services, he initiated various projects for academic advising, peer tutorial, open forum, community outreach and study skills. He has very good relations with embassies of many different countries in Oman as a result of which he has attracted international students from all over the world.



Dr. Sharana Gouda

ASST. CONTROLLER OF PATENTS AND DESIGNS, GROUP LEADER- BIOTECHNOLOGY DIVISION, THE PATENT OFFICE, GOVERNMENT OF INDIA

Dr Gouda is currently working as Assistant Controller at Indian Patent Officer since 2003. He received his PhD from Gulbarga University, Karnataka India in 2003



Dr. Mahesh Burande

HON. DIRECTOR, INSTITUTE OF PHARMACEUTICAL EDUCATION & RESEARCH, PUNE

Dr. Mahesh Burande is currently working as Director at Institute of Pharmaceutical Education & Research, Pune. He completed his B. Pharm. from K.M. Kundanani, Mumbai, M. Pharm. From L.M. College, Ahmedabad and D.B.M. from IMDR, Pune, 1984. He has more than 30 years of rich experience as a trainer and consultant to more than 100 pharmaceutical companies. His training programme inspires & ignites the minds of participant to build quality. His unique displays on cGMP, quality, productivity & positive attitude are appreciated by USFDA during various plant audits. He has been awarded as most promising institute in the country in applied pharmacy education by Pharma Leaders award 2012. He is the recipient of Best Young Pharmacy Teacher Award from Association of Pharmaceutical Teachers of India 1997-98, The Indian Pharmaceutical Association Fellowship Award 2002, Drugs Inspectors Welfare Association Award as a Doyen of Pharmacy Profession 2002, Lifetime Achievement Award from Purely Chemist Forum, K. M. Kundanani College of Pharmacy Best Alumnus Award, Bharati University Poona College of Pharmacy Outstanding Pharmacy Contribution Award as best Alumni 2006 and Maharashtra Pharmacists Association Award 2009 for promoting pharmacy profession in the society.



Dr. Nagaraj N.

HEAD - MEDICAL WRITING AND BIOPHARMACEUTICS, AXIS CLINICALS LTD., HYDERABAD

Dr. N. Nagaraj Kumar brings more than 18 years of combined experience in Pharmaceutical R & D and Contract Research, supporting the highly regulated generic drug development on varied dosage forms with diverse therapeutic benefit. He has hands on operational experience in Clinical, Bioanalytical Development and applied Biopharmaceutics. Currently he is associated with Axis Clinical Research based at Hyderabad as Head of Biopharmaceutics, Biostatistics, Clinical Data Management, SAS Programming and Medical Writing. Prior to Axis Clinical Research, he worked with reputed global pharmaceutical companies like; Sandoz (a Novartis group Company), Perrigo, Aurobindo Pharma Ltd and CROs like; Wellquest (a Nicholas Piramal (I) Ltd company) and Vimta Labs. He played a vital role in establishing Clinical Pharmacology Units in compliance to GCP/GLP standards at Aurobindo Research Centre and Sandoz. His contributions in highly matrix environment, in the capacity of global functional head for Clinical Development and global scientific core team member at Sandoz were well recognized for developing the innovative strategies and to improve the collaborations, processes and success rate of bio studies. He pursued Master's Degree in Pharmacy from Rajiv Gandhi University of Health Sciences, Bangalore and Doctoral Research Program in Pharmacy (Bioanalytical Research) from KLE University, Belgaum. He organized and chaired several scientific events at previous organizations and Authored few research articles in eminent International and National Journals. He has been an invited guest speaker / resource person on scientific programs organized by various Universities and Pharmacy Colleges in India.

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Dr. Jayasekhar P.

**PROFESSOR & CHAIR COLLEGE OF PHARMACY NATIONAL
UNIVERSITY OF SCIENCE AND TECHNOLOGY, OMAN**



Dr. Jayasekhar Nair has completed his Ph.D. degree in pharmaceutical chemistry. He is working as Professor of medicinal chemistry and chair of Pharmacy Program of Oman Medical College. He has 25 years of teaching and research experience in medicinal chemistry and has a lot of scientific publications in reputed international journals to his credit. At present he is supervising four Ph.D. candidates and his areas of research interest are molecular modification and pharmacological screening of heterocyclic molecules and computer-aided drug design.

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Dr. Anandi V. Law

**WESTERN UNIVERSITY OF HEALTH SCIENCES COLLEGE
OF PHARMACY, POMONA, CALIFORNIA**



Anandi V. Law, B. Pharm., MS., PhD, FAPhA is Associate Dean for Assessment, and Professor, Department of Pharmacy Practice and Administration at Western University of Health Sciences College of Pharmacy, Pomona, California. She was formerly Department Chair for 10 years. Dr. Law received her B. Pharm., from the University of Mumbai, India, and her MS in Pharmaceutics and PhD in Pharmacy Administration, both from the Ohio State University. Dr. Law is an established educator, researcher and mentor, who has served in pharmacy education for 20 years. Her teaching to PharmD students encompasses Health Systems, Pharmacy Management, Pharmacoeconomics, stress management (Yoga, Meditation, Mindfulness) and Leadership. Dr. Law's career focus is pharmacist impact on improvement of patient medication use outcomes; and measurement of patient-reported outcomes. The survey tools developed by her research team are now being used across several countries (PSPSQ2.0, MDRAW). She has several grants, more than 80 presentations, more than 60 peer-reviewed publications and a few book chapters. Dr. Law has directed a successful Outcomes Fellowship since 2003, which has graduated 7 fellows and is peer reviewed by the American Colleges of Clinical Pharmacy. She is passionate about developing student professional pride and advocacy. Dr. Law is active in professional associations such as CPhA, APhA, AACP and ISPOR and served as Chair of Council of Faculties and on the Board of Directors of AACP from 2015-2018. She is an inducted member of Rho Chi honor society and Phi Lambda Sigma leadership society, a graduate of the Academic Leadership Fellows program through AACP, and was named fellow of APhA in 2013.



Dr. Mohammad Isreb

**LECTURER IN CLINICAL PHARMACEUTICS,
BRADFORD UNIVERSITY, UK**

Dr. Isreb currently working as Lecturer at School of Pharmacy, University of Bradford, UK. He was Post-graduate research student at School of Pharmacy, University of Bradford, UK from 2007-2011. Dr Isreb from 2006-2007 worked as Part Time Lab Supervisor at De Montfort University, Leicester, UK, from 2005-2006 as Lecturer assistant, University of Aleppo, Syria, from 2005-2006 as Pharmacist at Asia Pharmaceuticals (Sterile manufacturing), Aleppo Syria, from 2004-2005 as Community pharmacist, at Latakia, Syria and from 1999-2004 as Undergraduate student at Faculty of Pharmacy and medical science, University of Petra, Amman, Jordan.



Dr. Varun Vaidya

**DIRECTOR GRADUATE PROGRAMS HEALTH
OUTCOMES AND SOCIOECONOMICS SCIENCES,
UNIV. OF TOLEDO, USA**

Dr. Varun Vaidya works in the multidisciplinary field of health services research that investigates how people access healthcare, how much it costs, and outcomes associated with it. It combines research from various fields such as economics, public health, epidemiology, biostatistics, and other related areas. Research in this area provides valuable insights into shaping healthcare systems around the world. Optimizing healthcare costs, delivery, and access to the entire population is a challenge faced globally. Dr. Vaidya's primary expertise is in developing studies and conduct data extraction and analysis using healthcare claims data, or other publicly available or for purchase datasets to help understand health services utilization, cost, treatment patterns, of therapies. He is currently the directors of HOSS at the University of Toledo and oversees the graduate programs. He has over ten years of experience in teaching and applying Pharmacoeconomic models and studying cost-effectiveness, cost-utility, and cost-benefit analysis of treatments and health technologies. His research group at the University of Toledo focuses on research related to delivery and access to healthcare, evidence development, value propositions for new treatments and technologies. He has published his research in various highly recognized journals in medical and health sciences. He has published 30 papers in peer-reviewed and over 50 abstracts presented at various regional, national and international research conferences. He has trained and mentored several graduate students as well as pharmacy and medical residents and fellows. Outside of academia, he has been actively sought after by the pharmaceutical industry, hospitals, and healthcare professionals to provide his input on research and development. He has collaborated with fortune 500 pharma companies, top-notch academic centers, hospitals, and health systems.

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APTICON 2019

Workshop Abstracts



Innovation and knowledge exchange in academic set-ups: challenges and opportunities

Paradkar Anant

INTERDISCIPLINARY CHAIR IN PHARMACEUTICAL ENGINEERING SCIENCE, UNIVERSITY OF BRADFORD, UK

Email: A.Paradkar1@bradford.ac.uk

Universities are considered as hubs of innovation and knowledge exchange. Development and maintenance of the innovation culture in the universities is the primary and most critical task. The universities have to develop suitable support structures including strong research and knowledge transfer departments which will provide ecosystem required for innovation. Senior and middle management need to develop performance management and incentivisation to challenge and encourage academics. Another important aspect in innovation is interaction with the industry which already exists in the form of Industry Institute Partnership Cell (IIPC) in most of the universities and colleges. The IIPC scheme should be made more relevant to maximise innovation and its impact in the universities. There is need to develop flexible and out-of-box knowledge exchange models which are optimised for the academic institutions. There are major differences in the education as well as research and knowledge exchange systems in the western countries compared to Indian systems. Therefore, while adopting the models there is need to tailor the systems transfer models for Indian academic systems. The workshop will focus discussion on the development of approaches to address current challenges and exchange some of the good practices across the world.

Writing Scientific Articles for Publication in High Impact Journals

Aparasu Rajender. R.

PROFESSOR AND CHAIR, DEPARTMENT OF PHARMACEUTICAL HEALTH OUTCOMES AND POLICY, UNIVERSITY OF HOUSTON, UNITED STATES

Email: raparasu@Central.UH.EDU

With increasing emphasis of publishing in high impact journals, there is a greater need for academia to train next generation of scientific writers. In this information era, the graduates not only need to conduct high quality research but also publish their scientific work in high impact journals. This interactive workshop is designed for biomedical scientists and educators involved in graduate education. This workshop focuses on strategies to develop coherent, clear, and persuasive sections of a scientific research paper, including Introduction, Methods, Results, and Discussion. It will also cover designing tables and figures and writing a clear and concise abstract and cover letter for submission to a science journal. The participants will also learn about the publication process including editorial decision making process.

Patenting of pharmaceutical inventions

Gouda Sharana

ASSISTANT CONTROLLER OF PATENTS AND DESIGNS, THE PATENT OFFICE, GOVT. OF INDIA, GST ROAD, GUINDY, CHENNAI-600032

Email: gouda.ipo@nic.in

Intellectual property rights (IPR) have been defined as ideas, inventions, and creative expressions based on which there is a public willingness to bestow the status of property. IPR provide certain exclusive rights to the inventors or creators of that property, in order to enable them to reap benefits from their creative efforts or reputation by commercialization. There are several types of intellectual property protection like patent, copyright, trademark, etc. Patent is recognition for an invention/research work, which satisfies the criteria of global novelty, non-obviousness, and capable industrial application. Patent plays a vital role in development of the research in the world. Every country has its own IPR policies and that support the research environment and better opportunities in commercialization of the research work and thereby protection of invention or creativity. Patentability covers the pharmaceutical products including herbal formulations and excluding the traditional knowledge or aggregation of properties of traditionally known components along with new forms of known substances such as Isomers, polymorphs, pure form, salts, other derivatives etc. which do not result in the enhancement of the known efficacy. The formulation of herbs is the emerging area in pharmaceutical field in India. The existing law will boost Indian Pharmaceutical research especially in the field of herbal formulations and help the nation to emerge as a strong force in global pharmaceuticals.

Team based learning at Bradford University

Isreb Mohamma

LECTURER IN CLINICAL PHARMACEUTICS,
BRADFORD UNIVERSITY, UK

Email: M.Isreb1@bradford.ac.uk

When designing the 2012 MPharm curriculum, the School of Pharmacy and Medical Sciences at the University of Bradford opted to using TBL as the central learning and teaching strategy for its delivery. TBL is an active collaborative flipped classroom approach that places the student at the driving seat of the learning process. Its innovative approach mitigates many of the drawbacks of collaborative group works. By pre-loading the reading material upfront, classroom time is used to discuss the topics in depths and apply the knowledge in simulated settings. The workshop will shed the light on the challenges and the lessons learnt while applying this approach as the main delivery strategy for our MPharm course and how this culminated in winning the Collaborative Award for teaching Excellence in 2017.

Use Ki OSCE: Best Practices for OSCE as an Effective Student Learning Assessment

Law Anandi V

OSCEs have been successfully used as an assessment of student learning at the speaker's institution since two decades. This workshop will begin with an outline for developing OSCEs, within a Structure – Process – Outcome framework. Attendees will participate in a team-based, hands-on experience comprising four areas of OSCE: case writing geared for OSCEs, logistics of OSCE set up, grading rubrics and personnel, analysis of OSCE grades and student feedback. The workshop will conclude with application of content to effective use of OSCEs in attendees' home institutions.



APTICON 2019

Plenary-Session Abstracts

Regulatory role of HCMV miRNA's on Cellular Apoptosis

Gosipatala Sunil Babu*

DEPARTMENT OF BIOTECHNOLOGY,
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY,
LUCKNOW- 226025

*Email: sunil_gos@yahoo.com

Human cytomegalovirus (HCMV), DNA (230-240 Kb) virus, belonging to γ -Herpesviridae family, establishes lifelong latency upon primary infection. It exhibits ~100% seroprevalence in lower socioeconomic environments of developing countries, including India. It causes significant morbidity and mortality in the immunocompromised and neonates. HCMV, has co-evolved with its human host, acquired myriad evasive strategies for its survival and majority of its genome is dedicated for these mechanisms. One among such mechanism evaded by HCMV is apoptosis and its suppression increases the survival chance. Suppression of apoptosis by HCMV is attributed to its proteins, and the genomic region UL36-38, called as cell death suppression loci. By performing in silico studies, we identified antiapoptotic nature of HCMV miRNAs, and it gave the idea that there is another layer of regulation exerted on apoptosis by HCMV. Our results show hcmv miR UL 70-3p & UL 148D targets proapoptotic genes, MOAP1, ERN1 respectively. In vitro studies using HEK293T cells show that the miR UL 70-3p downregulate the H₂O₂ induced apoptosis. Further studies on the mRNA expression of MOAP1 levels show that miR UL-703p significantly downregulates mRNA expression. These results suggest that the miR UL 70-3p downregulates H₂O₂ induced apoptosis in HEK293T cells by targeting the MOAP1.

Inhibition of DNA Repair as a Strategy to Treat Cancer

Raghavan Sathees C *

DEPARTMENT OF BIOCHEMISTRY, INDIAN
INSTITUTE OF SCIENCE, BANGALORE, INDIA

*Email: sathees@iisc.ac.in

Repair of DNA breaks is critical for maintenance of genomic integrity. DNA double-strand breaks (DSBs) are the most deleterious types of DNA damage. Nonhomologous end joining (NHEJ) is the predominant DNA DSB repair pathway in higher eukaryotes. DNA Ligase IV is one of the most critical components of NHEJ, involved in final sealing of DSBs. Inhibition of DSB repair pathway proteins can be used as a strategy to induce apoptosis in cancer cells. Recently we have chemically synthesized and characterized a novel inhibitor of Ligase IV, SCR7. Using DNA mimicking various in vivo DSBs, we showed that addition of SCR7 to testicular extracts abolished joining by NHEJ. Further, SCR7 interfered with the joining of DSB ends catalysed by purified Ligase IV. Further using animal models, we find that SCR7 treatment inhibit progression of tumor, resulting in a significant increase in life span in mice. Interestingly, SCR7 impedes tumor progression significantly, when coadministered with radiation. More importantly, we show that when coadministered, SCR7 could reduce the effective dosage of γ -radiation from 2 Gy to 0.5 Gy, in cancers derived from breast cancer, colon cancer and B-ALL. Histopathological and immunofluorescence evaluation of tumor and other tissues suggest that the cytotoxicity induced is mostly restricted to the tumor. We also find that encapsulation of SCR7 in micelles can improve its efficacy by ~4-fold. Recently, we observed that SCR7 can exist in multiple forms, and all forms can block NHEJ in a Ligase IV dependent

manner. Thus, by using various biochemical and biophysical approaches, we show that SCR7 is a potent inhibitor of DNA repair, and can be used as a chemotherapeutic agent against multiple cancers.

Impact of pharmacogenomics in Asians

Gan Siew Hua*

SCHOOL OF PHARMACY, MONASH UNIVERSITY MALAYSIA,
JALAN LAGOON SELATAN, 47500 BANDAR SUNWAY,
SELANGOR, MALAYSIA

*Email: gan.siewhua@monash.edu

Although there are many factors such as body weight, gene, age and gender all of which affect interindividual variability, most drug doses are based on only body weight. Since most studies are conducted in the Western countries, the said body weight is that of the Caucasian body weight. This move may not be exactly appropriate for Asians who generally are of smaller body size. The objective of the study is to investigate how Asians metabolise drugs and to individualise treatments based on the genes. Patients were genotyped for cytochrome P450 (CYP) 3A4 (which metabolises approximately 60% of drugs) and CYP2D6 (which metabolises approximately 25% of drugs). Approximately 40.22% of patients has CYP2D6*10 allele which contributes to a slower metabolism. These patients may be more prone to drug's side effects and require a reduced dose. Subjects having the CYP3A4*1/*18 genotype had 34% longer elimination half-lives of a certain drug when compared to the wild type which again may affect the clearance of many drugs. CYP polymorphisms are important when taking into account drug dosings for Asians in order to deliver a safer and more individualized treatment.

Achieving

translation through interdisciplinary research

Paradkar Anant*

INTERDISCIPLINARY CHAIR IN PHARMACEUTICAL
ENGINEERING SCIENCE, UNIVERSITY OF BRADFORD,
UK

*Email: A.Paradkar1@bradford.ac.uk

All over the world there are growing pressures on the universities to translate the research carried out in the laboratory to address societal needs. In general, the structure of universities and colleges focus their resources through their discipline-based schools and departments to achieve administrative and teaching efficiency. This promotes working in silos



and adversely affect the innovation and translation of research. This is further complicated by the compliance requirements of funding agencies and educational/ professional regulatory agencies. The researchers are developing strong interdisciplinary approach, as the societal needs are complex in nature and can only be addressed through an interdisciplinary approach. To accelerate the process of translation through interdisciplinary research will require significant changes in the structure and administration of academic institutions. The higher education institution infrastructure in India is unique in many aspects and provides huge opportunities. Development and implementation of strong interdisciplinary research and translation strategy at institutional level will provide significant benefits.

Emerging Models of



Pharmacy Practice in the US: Moving towards Direct Patient Care

Law Anandi V*

DEPARTMENT OF PHARMACY PRACTICE AND
ADMINISTRATION AT WESTERN UNIVERSITY OF HEALTH
SCIENCES COLLEGE OF PHARMACY, POMONA, CALIFORNIA

*Email: alaw@westernu.edu

The speaker will track the history of patient focused care within the practice of pharmacy in the US; explaining each type of model, with its challenges and opportunities. The presentation will elaborate on current models, from Disease Management, MTM, Medication Reconciliation, Adherence Counseling, Transitions of Care, along with payment systems for each. Relevance of each model will also be described within the changing health care environment.

Need of foundation program in higher education system for non-english speaking countries

Yaseen Moosa Al Lawatia*

SCHOOL OF FOUNDATION STUDIES, NATIONAL UNIVERSITY
OF SCIENCE AND TECHNOLOGY, SULTANATE OF OMAN

*Email: yaseen@nu.edu.om

A foundation program for fresh university/college students is a global practice. It plays a pivotal role in preparing undergrad students before they start their



majors. An ideal foundation program is necessary for an undergrad student to bridge the wide gap between the academic requirements of the school and that of a college/university. A solid foundation program helps in smooth and successful transition from school to higher education. Therefore, careful planning of the Foundation course contents, especially in non-English speaking countries, is needed to meet the requirements of specific professional courses. English language proficiency is given due importance as English is the medium of instruction in higher education institutes (HEI) in Oman and worldwide. In addition, most study resources and research materials are available in English. Therefore, English language courses are offered to hone language skills of the students. An advanced proficiency in English would ensure greater achievement in terms of academics and level of student confidence. Supplementary content of the foundation program includes computer and information technology courses, research skills, time management, stress management and study skills to prepare students for academic challenges. Measuring the effectiveness of the Foundation Program is essential to evaluate the extent to which the foundation program has helped students attain the required competencies for their chosen professional field.

Qualities and capabilities of future Pharma Gurus

Swarnlata Saraf*

UNIVERSITY INSTITUTE OF PHARMACY, PT. RAVISHANKAR
SHUKLA UNIVERSITY, RAIPUR-492010

*Email: swarnlataсарf@gmail.com

In the digital and competitive age of the 21st century, Pharma Gurus have to be able to develop and enhance student's capability to tolerate and adjust in any field and to make a critical and positive thinker, be innovative, creative, adaptable, passionate and

flexible attitude and also developed humanity and moral values. Gurus must know their students and notice is now more important than ever before. Gurus should have some specific qualities and capabilities to give tools both digital and knowledgeable to leads them to a place of success. The potential of gurus comprises a set of psychological personal qualities conducive to a successful pedagogic manner is his/her capability. The most important quality of a future guru is the quality of good communication skills and that to be outstanding like verbal and non-verbal interaction with students and visual interaction which involve speaking, imagery, writing, body language as well as the organization of ideas into understandable structures. They can spread their aura of knowledge with the better skill to get the result. As we know, effective verbal interaction happens when two persons are actively involved in the process together and know if the communication is heard by asking and listening to the answers. Then gurus will be able to keep a caring relationship with their students and easily approachable to sort out the queries. They will work as a community maker with strong work ethics. The capabilities of guru have a strong connection with their quality because the education contents, context, and the process must have such quality that leads to target-based learning outcomes. Guru capabilities in terms of their values, practices are always as contemporary issues of the society. In future the gurus will be able to learn by design and implementation of e-Learning approaches, enabling the development of future gurus with appropriate dispositions, values, capabilities, and beliefs, to capitalize the potential of advanced, new and emerging technologies to enhance learning and teaching. They are also willing to enhance their skills with the application of advanced and new technologies.

Tacrolimus dosage selection depending on genetic profile:

a personalized medicine approach

Nair Radhakrishnan R*

HEAD LABORATORY MEDICINE & MOLECULAR DIAGNOSTICS,
RAJIV GANDHI CENTRE FOR BIOTECHNOLOGY, GOVT. OF
INDIA

*Email: radhakrishnan@rgcb.res.in

Pharmacogenetics is the study of genetic variation that determines how individuals respond to specific drugs. It allows clinicians to more accurately determine the right drug and dosage for the patient and thus avoid adverse drug reactions (ADRs). Transplantation is typically the standard of therapy for all patients with end-stage liver or kidney disease. Since the success of the transplant depends on a delicate balance between immunosuppression and rejection, reaching and maintaining an adequate therapeutic level by giving appropriate doses of immunosuppressive drugs is extremely important, especially in the first phases after the transplant. Tacrolimus (Tac), an immunosuppressant used in organ transplant recipients, has a narrow therapeutic range and exhibits inter-individual pharmacokinetic variability. Tac is metabolized by two enzymes of the cytochrome P450 family, CYP3A5 and CYP3A4, in the gut and liver, and transported in the gut by P-glycoprotein (P-gp), encoded by the MDR1/ABCB1 gene. Thus, CYP3A5, CYP3A4 and ABCB1 polymorphisms could have an important role in dose requirements. Renal transplant recipients receiving Tacrolimus as an immunosuppressant was recruited from Department of Nephrology, Government Medical College, Thiruvananthapuram. Tac trough concentrations (C₀), doses, concomitant medications, complications, co-morbid conditions and drug adverse effects were recorded. The dose-adjusted Tac trough concentration (C₀/D) was calculated by dividing the measured C₀ by the corresponding daily Tac dose (D). SNP genotyping was performed using the PCR-RFLP method from the DNA extracted from

the patient's samples. Allele, genotype frequencies and linkage disequilibrium (LD) will be calculated using UNPHASED software for genetic association analysis, version 3.1.7. Comparison of C₀/D to genotypes by one-way Anova and linear regression, and Box-plot analysis were performed using SPSS version 20.0 statistical software. This retrospective study examined the contribution of gene polymorphisms to the dose-adjusted tacrolimus concentration (C₀/D) and drug-induced adverse effects in renal transplant recipients. We assessed the CYP3A5*3, CYP3A4*1G, CYP3A4*1B, ABCB1 C3435T and ABCB1 G2677T genotypes of 156 renal transplant recipients. This is the first in-depth study including various functional polymorphisms and epistatic interactions between different genes to develop a robust prognostic and predictive pharmacogenomic biomarker with clinical applicability, specific to South Indian population, which can predict individuals' response to Tac. Our data will help identify patients who might have higher/lower Tac levels, and those at high risk of developing Tac-related complications can be identified even before their organ transplant and can help the clinician decide the initial dosage of Tacrolimus. We have identified specific genotypes which are associated with a higher C₀/D level in the patients. Thus, patients who carry CYP3A5*3 GG and CYP3A4*1G GG genotypes are poor metabolizers of Tac and can have a higher Tac level and may be given a lower initial Tac dose. This tailor-made therapy could minimize Tac toxicity and adverse effects due to over-dosage and graft rejection due to low drug levels. We have also identified genotypes which are associated with adverse effects like New onset diabetes mellitus after transplantation (NODAT) and Tac toxicity.

Drug repositioning what, why and how

Dixit R.K *

**Email: dixitkumarrakesh@gmail.com*

Bringing a new drug to market is expensive, time taking and risky business. Only one out of 8000 compounds tested in animals reaches human testing, and only one of five compounds reaching clinical trials is eventually approved. When new compound is evaluated for its potential therapeutic place the journey starts from the preclinical safety, toxicity and acceptability studies followed by the various phases of clinical trials devoted to the acceptability pharmacokinetics dose assessment and therapeutic uses. A huge amount of time and money is required for doing the preclinical studies and getting approval for the first administration to human. Therefore, it becomes rational to explore better and new in the existing compound rather than screening and doing the preliminary studies in the newer one. Drug repurposing (repositioning) is done for those compounds which have already been assessed preclinically and the data of safety and preliminary pharmacokinetics can suggest to proceed further or not. Therefore, the repurposing can save lots of money and time involved in the new drug development. Drug repurposing is an important component of

therapeutic developments in the era of medicine paradigm. These studies become more important in finding the therapeutic solutions for complex diseases including cancers and orphan diseases.

Sophisticated analysis including molecular profiling and critical evaluation of clinical data are the needs and opportunities to reposition approved drugs for alternative indications. It requires computational and experimental data, molecular and clinical data, bioinformatics, statistical tools and experimental techniques to find out new place of old drug. Important examples of using approved drugs for new indications are anti-malarial drugs in systemic lupus erythematosus, rheumatoid arthritis, and connective tissue diseases, thalidomide as an anticancer agent and the use of duloxetine for urinary tract infection. Biggest additions are genomics technologies and computational approaches

to enhance the novel approaches for drug repurposing. Use of these has found the positive indications for the usefulness of old drugs in treatment of different types of cancers. Different methods used for drug repurposing are target-based repositioning, disease-based drug repositioning, expression datasets or signature-based drug repositioning etc. Semi / high throughput approaches, target-based screens, molecular profiling screens, gene expression profiling



are used for systematic drug repurposing. Drug repurposing study is three-step process.

Primary analyses use data from expression signatures, target biology, protein-protein or protein-small molecule network datasets (co-expression or Bayesian) and generates a list of ranked compounds for further evaluation. Secondary analyses approach to filter compounds for validation. Tertiary analyses aim to validate the compounds using experimental, pre-clinical models and assess outcomes. Some of the data bases used for the drug repurposing are Cancer Cell Line Encyclopedia (CCLE), ChEBI, Chemistry Development Kit (CDK), ChemMine Tools, ChemProt etc. Drug repurposing can bring new therapies in approximately half the budget and time due to availability of pre-existing data on efficacy, toxicity, dosing and biological knowledge of the compounds.

Molecules that have failed clinical trials due to lack of efficacy or minor adverse profiles can also be used as candidates for drug repurposing for the new indications. Drug repurposing may solve by providing therapeutic compounds for complex, chronic or orphan diseases using already existing molecular information. The future outlook of drug repositioning is promising for translational researchers. Drug repurposing offers a cost-effective, accelerated and effective strategy

for therapeutic options. Therefore, following are the answers related to queries of drug repurposing. What is drug repurposing? Ans is Drug repurposing (also known as drug repositioning or drug reprofiling) is the process of redeveloping a compound for use in a different disease. The compounds have already been tested in preclinical and clinical testing and detailed information is available on their pharmacology, formulation, dose, and potential toxicity.

Why we need drug repurposing? Ans is to reduce time, money and risk in drug development. Also, it is well-known fact that common molecular pathways contribute to many different diseases therefore the compound useful in one disease may be of use in some other ailments. How drug repurposing is done? Ans is by either of the two 'activity-based drug repositioning' or 'in silico drug repositioning'. In former application of actual drugs for screening while in later public databases and bioinformatics tools to systematically identify interaction networks between drugs and protein targets are utilized. Both strategies have certain advantages and drawbacks. In general, in silico drug repositioning is fast, less expensive but need very high-resolution structural targets, disease phenotypic information and gene expression profile of drug.





Recent developments in medicinal chemistry and challenges in developing low cost haemodialysis cartridges

Isloor Arun M*

MEDICINAL CHEMISTRY & MEMBRANE TECHNOLOGY
LABORATORY, DEPARTMENT OF CHEMISTRY, NATIONAL
INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL,
MANGALORE 575 025, INDIA

**Email: isloor@yahoo.com*

Medicinal chemistry and pharmaceutical chemistry are disciplines at the intersection of chemistry, especially synthetic organic chemistry, and pharmacology and various other biological specialties, where they are involved with design, chemical synthesis and development for market of pharmaceutical agents, or bio-active molecules (drugs). Present talk highlights about synthesis, characterization and pharmacological activities of few of the important broad classes of small organic molecules such as Pyrazoles, Imidazoles and Quinolines. Haemodialysis, commonly called kidney dialysis or simply dialysis, is a process of purifying the blood of a person whose kidneys are not working normally. This type of dialysis achieves the extracorporeal removal of waste products such as creatinine and urea and free water from the blood when the kidneys are in a state of kidney failure. Hemodialysis is one of three renal replacement therapies (the other two being kidney transplant and peritoneal dialysis). An alternative method for

extracorporeal separation of blood components such as plasma or cells is apheresis. Haemodialysis, requires a semipermeable polymer membrane to separate blood from dialysate solution. The nature and properties of this membrane determines the nature of the 'traffic' between the blood and dialysate.

In this sense, the nature of the polymer membrane determines the size of molecules move from one compartment to the other. Apart from this, the nature of the polymer material and the membrane influences on the biological response of the patient both in terms of what is or is not removed by the dialysis process and by way of the reaction to the biocompatibility of the membrane. Commercially available haemodialysis cartridges costs anywhere around INR 1800 (around 27 USD) per unit. This talk also explores about preparation of dialysis membrane and also challenges in developing such low cost cartridges.

Research-Teaching Nexus is the Need of Hour in Pharmacy Education

Jayasekhar P*

SCHOOL OF FOUNDATION STUDIES, NATIONAL UNIVERSITY
OF SCIENCE AND TECHNOLOGY, SULTANATE OF OMAN

**Email: jayasekhar@nu.edu.om*

The link between research and teaching-learning process in higher education institutions is well established. The research and teaching nexus can be managed effectively with proper strategy and outcome analysis. A perceived misalignment between institutional incentives for the academic staff and faculty involved in research and teaching process can be noted in most of the institutions. The institution shall deploy pragmatic strategies in the curriculum design, staffing and curriculum delivery to achieve

sustainable research and teaching –learning nexus. The undergraduate pharmacy program or professional doctoral program shall have courses in research methodology, biostatistics, literature evaluation etc. to facilities research studies and institution shall deploy teaching faculty with proven research capability. The pharmaceutical science and pharmacy practice courses of the curriculum shall be spirally integrated with evidence based research findings where the students develop inquisitiveness towards research and involve in research methods and techniques. The faculty engenders a research ethos through their teaching. In B.Pharm and Pharm D programs, the students are expected to take up individual research projects or group projects under the guidance of a faculty member. Faculty members and students are expected to follow ethical and professional guidelines while carrying out research. The research findings have to be shared and presented in appropriate platforms so that they can discuss and learn from the research experience of others. The institution shall implement a systematic approach to ensure its research and scholarly activities have a positive impact on teaching and student learning. The faculty research and scholarly activities are to be incorporated into student learning in order to foster student interest and understanding of the benefits of research. The students get opportunity to discuss the research findings in team based learning (TBL) environment with the faculty. The student participation in research shall result in publication or commercialization and is given appropriate recognition and attribution. The regular reviews of the effectiveness of the research and teaching –learning nexus and incorporating research and scholarly activities into teaching shall ensure a positively impact on student learning. The improvement of research nexus shall be periodically assessed. The deployment of pharmacy faculty in research –teaching-learning process, effective involvement of students and outcome measures will be discussed.

Teaching Innovations to accept Challenges of Growing Pharmacy Profession

Burande Mahesh*

HON. DIRECTOR, INSTITUTE OF PHARMACEUTICAL
EDUCATION & RESEARCH, PUNE

*Email: mahesh.burande@gmail.com

It is said that Sarvada Vigyata Vijaya that means Skill Always Wins. As a pharmacy teachers we should identify the skills required in pharma Industry and try to develop such skills during pharmacy course while teaching your subject. Statistics says that only 3% skills are developed in India with traditional programmes while developed countries it goes to above 50%. In South Korea it goes to 96%. PMKVY is targeting skill India around 2023 and around 42 crores of people should be skilled and pharma no. itself will go to 2 crores. We have conducted several training programmes across India in various pharmacy colleges and developed skills which Industry required. This presentation will elaborate certain skills which easily can be developed in pharmacy students to accept challenges of pharma industry.

Importance of GLP in Drug Development – Case studies



Nagaraj N Kumar*

HEAD MEDICAL WRITING AND BIOPHARMACEUTICALS, AXIS
CLINICALS LTD, HYDERABAD

Email: nagamalli442@gmail.com

The scope and extent of GxP is widening in pharmaceutical development and GLP (Good Laboratory Practice) is an integral part in it. Unequivocally, Pharmaceutical companies and sponsors are obliged to comply with the requirements of GxP in drug development for getting a marketing authorization for their products from regulatory agencies/ health authorities. Furthermore, acceptability of drug product's safety and efficacy data by the health authorities would increase, when such data are generated from the studies conducted in accordance with the GxP norms. Therefore, this topic "Importance of GLP in Drug Development – Case studies" is chosen to address silent features of GLP in drug development and some cases demonstrating the consequence, when it is violated.

HEOR and decision-makers healthcare Decision-Making

Vaidya Varun*

GRADUATE PROGRAMS HEALTH OUTCOMES AND
SOCIOECONOMICS SCIENCES, UNIVERSITY OF TOLEDO, USA

**Email: varun.vaidya@utoledo.edu*

While randomized clinical trials (RCTs) provide a gold standard in evaluating the efficacy of new medications, treatments, and medical devices, health economics and outcomes research (HEOR) deliver empirical evidence that is supplementary to the RCTs. Besides the safety and efficacy of new products, currently, it is very important to demonstrate the cost-effectiveness, often referred to as value-proposition of the product. For the new drug developers, successfully managing the value-proposition of their products means increased collaboration with providers, payers,



health systems of and other stakeholders. All of these decision-makers agree upon the need to procure additional data and analyze it to demonstrate the total value of their products. There is an increased demand for researchers, analysts, project managers across the pharmaceutical industry and contract research organizations (CROs). It is a relatively new frontier with much potential for pharmacy graduates with the intent to further their education or join the workforce.

Real world evidence: research skills and opportunities to improve patient outcomes

Aparasu Rajender R*

**DEPARTMENT OF PHARMACEUTICAL HEALTH OUTCOMES
AND POLICY, UNIVERSITY OF HOUSTON, UNITED STATES**

**Email: rraparasu@uh.edu*

Limited evidence is generated regarding medication effectiveness and safety from randomized trials involving selective patients, small samples and short study periods. Real World Evidence is playing important and increasing role in improving patient care and outcomes. This requires practitioners, researchers, and educators to understand and implement clinical observational research. Observational research evaluates various pharmaceutical products and services to provide real-world evidence on effectiveness of treatments/interventions in different populations and situations. This requires application of epidemiological and non-experimental research methods in population-based studies to generate clinical, humanistic, and economic real world evidence. This seminar will cover the concepts and application of clinical observational research to generate real world evidence for improving patient outcomes.

A man in a dark blue suit, white shirt, and dark tie is shown from the waist up, gesturing with both hands open and palms facing up. He is looking towards the left side of the frame. The background is a light, textured grey.

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OA-01: Topical anti-psoriatic nano-particulate Unani drug delivery system

BHISE K S*, KHAN S, MULLA G

ALLANA COLLEGE OF PHARMACY, PUNE, MAHARASHTRA- 411001

Email: ksbhise@rediffmail.com

Several attempts have been made in overcoming psoriasis with prolonged treatment duration. The oral anti-psoriatic agents though quite effective are associated with renal, hepatic and hematological toxicities. Topical therapy although being devoid of such adverse effects, exhibit setback of poor penetrability through the skin. Therefore, treatment of Psoriasis is considered to be impossible in the modern system of medicines. The topical treatments have also been described in the classical Unani literature, but their utility is limited due to the unacceptable appearance of the dosage forms and poor permeability across the skin. This work intends to explore the novel delivery strategy of nanoparticles to the existing classical Unani medicines for enhanced drug permeation and targeted drug delivery by formulating Nano Lipid Carriers (NLCs) of the selected anti-psoriatic drugs mentioned in the Classical literature. The NLCs were prepared by 23 factorial design and were evaluated for % drug loading, % entrapment efficiency, particle morphology, and in vitro cumulative % drug release. The optimized batch of NLCs were dispersed in 100gm of cream base and were evaluated for pH, viscosity, spreadability, % drug content, tube extrudeability and cumulative % drug diffusion, cell line, immunomodulatory and advance preclinical studies. The data demonstrates significant improvement in the anti-psoriatic efficacy of

the selected Unani drugs when loaded in the NLCs.

OA-02: Formulation and optimization of nanoparticles based in situ gel: in vitro characterization, ex vivo efficacy and ex vivo ocular irritation study

PATEL JAYVADAN*, UPADHYAY SHIVAM

FACULTY OF PHARMACY, SANKALCHAND PATEL UNIVERSITY, VISNAGAR, GUJARAT-384315

Email: jayvadan04@gmail.com

The aim of current study is development of Moxifloxacin (MFN) loaded nanoparticles incorporated into in situ gel for treatment of bacterial keratitis. Thermosensitive polymer, poloxamer grades were screened for in situ gel formulation at physiological temperature. At ambient temperature the optimized formulation exhibited Newtonian flow while at physiological temperature, very high viscosity with complete gel formation showed Thixotropic rheology. Optimized MFN NP-ISG formulation entrapped 94.47% drug, its particle size was 410.9 nm zeta potential was estimated to -30.4 mV reflecting their nano size and physical stable formulation. In vitro diffusion study showed sustained drug release. In vitro antimicrobial efficacy study revealed slightly higher antibacterial activity against gram +ve and -ve bacteria. Ex vivo efficacy study in caprine keratitis model exhibited that optimized MFN NP-ISG formulation reduced bacterial load significantly to about 4-logs (CFU/ml) in corneas infected with

Pseudomonas aeruginosa equivalent to MFN solution. Histopathology of corneas treated with MFN NP-ISG formulation showed slight recovery of epithelium compared with positive control. Ex vivo ocular irritation study by Hen's Egg Test-Chorioallantoic Membrane revealed that MFN NP-ISG formulation was found to be non-irritant and safe at provided dosage after topical ocular administration.

OA-03: In vitro exploration of supermagnetically modulated novel parenteral carrier: A targeted drug delivery of polymeric carboplatin nanospheres

DUBEY AKHILESH, GS RAVI, HEBBAR SRINIVAS

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

Email: akhilesh@nitte.edu.in

The current study was aimed at formulating and characterizing super magnetically modulated nanospheres for the treatment of breast cancer. Particulate carriers via magnetic drug delivery are a systematic method to deliver a drug to the particular disease site which was prepared by an emulsion-solvent evaporation method after passing the compatibility test by using Fourier transform infrared spectroscopy (FTIR). The in vitro parameters such as drug entrapment efficiency, particle size analysis, scanning electron microscopy (SEM), Differential scanning calorimetry (DSC), percentage magnetite content, swelling kinetics, in vitro

magnetic responsiveness, in vitro drug release and kinetics study to confirm the product development. FTIR study proved no interaction developed, drug entrapment was found to be in the range of satisfactory to very good, SEM ensured spherical shape and coating of vitamin C, mean particle size was found to be 150 nm, PDI value of F3 was found to be 0.251, DSC proved no significant interaction, maximum magnetite content was found in F3 with the magnetic responsiveness of 81.52%. Cumulative percent drug release was found to be. The kinetic study suggested diffusion coupled with erosion release pattern was followed. This study was found to be a satisfactory preliminary attempt for the development of supermagnetically modulated novel parenteral carrier.

OA-04: Nanoparticle wafers of doxorubicin for brain targeting therapy of glioma

VENKATESH MP, DAS TANMOY

DEPARTMENT OF PHARMACEUTICS, JSS COLLEGE OF PHARMACY, JSS AHER, SS NAGAR, MYSURU-570015

Email: venkateshmpv@jssuni.edu.in

The aim of the present study is to formulate polymeric implantable wafer with doxorubicin (DOX) incorporated into PLGA nanoparticles (DOX-PLGA-NP) and compressed into wafers (DOX-PLGA-NPW) intended to deliver in Brain for long-term period. DOX loaded DOX-PLGA-NP was prepared and compressed into wafers. DOX-PLGA-NP was optimized by investigating the effect of process variables on the response using a 2- factor, 3-level full factorial (32) design. Effect of two independent

factors; polymer concentration and surfactant were studied on two dependent responses, that is, particle size and % drug entrapment. They were characterized by SEM, DSC, particle size, zeta potential, % drug entrapment, drug release behavior, TEM, and cell viability. DOX-PLGA-NP was characterized for drug polymer interaction using FTIR. The developed NPs exhibited spherical shape with PDI of 0.123, and -19.3 mV zeta potential with maximum % drug entrapment of 50.42%. In vitro drug release showed initial burst release of the drug followed by prolonged release for a period of 188 h. In vitro cell viability study displayed a significant cytotoxicity toward C6 cell line. In view of the results obtained, the DOX-PLGA-NPW exhibited promising potential as carriers for implantable drug delivery system for malignant glioma.

OA-05: Formulation and evaluation of tamoxifen citrate loaded silk fibroin nanoparticles for the treatment of breast cancer

GANGADHARAPPA HV*, SHAHID UID DIN WAN

DEPARTMENT OF PHARMACEUTICS, JSS COLLEGE OF PHARMACY, JSS ACADEMY OF HIGHER EDUCATION AND RESEARCH, SRI SHIVARATHREESHWARA NAGARA, MYSURU-570015

Email: hvgangadharappa@jssuni.edu.in

The aim of the current study was to develop Tamoxifen citrate silk fibroin nanoparticles (TC-SFNPs), for better entrapment and improved cell penetration. The silk fibroin (SF) is natural biocompatible and biodegradable polymer used for the preparation of

nanoparticles (NPs) by desolvation technique to deliver anticancer drug to target site which provide better therapeutic effect against breast cancer cells without damaging the surrounding normal cells. TC-SFNPs formed in an aqueous solution at room temperature by self-assembling of polymer with a diameter of 165.09 nm, entrapment efficiency of 78.08% and drug loading of 37.55 %. Pure TC showed rapid drug release whereas NPs showed controlled release. In vitro cytotoxicity studies of TC-SFNPs on MCF-10, showed IC50 value of 169.46 µg/ml indicates normal cells are not affected whereas BC cells showed 47.36 µg/ml in MCF-7; 52.13 µg/ml in MDA-MB-231 than the free TC (56.21 µg/ml in MCF-7; 61.32 µg/ml in MDA-MB-231) and improved cellular uptake. In vivo Pharmacokinetic study signified 2.0-fold raises in MRT for TC-SFNPs. These results suggest that silk fibroin-based nanoparticles are potential carriers for delivery of anticancer drugs.

OA-06: Development and characterization of Nanosponges for the Delivery of Antiretroviral Drug

DUBEY NAINA* AND PATIL SHAILENDRA

SVN INSTITUTE OF PHARMACEUTICAL SCIENCES, SWAMI VIVEKANAND UNIVERSITY, SAGAR, MADHYA PRADESH-470228.

E-mail: nainadubey86@gmail.com

The main objective is development and characterization of cyclodextrin nanosponges for the delivery of antiretroviral drug stavudine and to improve its bioavailability to reduce the side effects. Cyclodextrin nanosponges were prepared by ultra sound assisted synthesis

with minor modifications and stavudine was loaded in cyclodextrin nanosponges using freeze drying. Prepared cyclodextrin nanosponges were of 405 ± 12 nm and 410 ± 15 nm size and showed extended release of stavudine from drug loaded cyclodextrin nanosponges which were stable at 4°C . The cellular uptake and cytotoxicity studies were also performed for the developed drug loaded cyclodextrin nanosponges. Stavudine loaded nanosponges showed increased potential of drug when loaded in nanosponges as compared to conventional dosage form, showed enhanced loading capacity due to the crystalline nature of nanosponges. The developed nanosponges have the potential for improving the therapeutic efficacy of drugs, cellular uptake and cytotoxicity studies proved that drug loaded cyclodextrin nanosponges are effective in treatment of viral disease.

Key words: Nanosponges (NS), Stavudine, Beta Cyclodextrin (β -CD), Dimethyl carbonate, Ultra sound assisted synthesis, Uranyl acetate.

OA-07: Design of Astaxanthin Loaded Biogels Using a Biofunctional Agent from Santalum Album Wood

**SIDDHARTH SINGH*, N V SATHEESH
MADHAV**

**FACULTY OF PHARMACY, DIT UNIVERSITY,
DEHRADUN-UTTARAKHAND-248009**

Email: siddharthsingh50@yahoo.com

The main aim of research was to explore the health promoting potential of astaxanthin in the form of bio-gels approach for dermal delivery systems loaded with biopolymer isolated from Santalum album for the treatment of psoriasis cutaneous disorder. Five astaxanthin

and biopolymer loaded biogels were prepared with other co-processing agents in 5 ratios and various evaluation parameters such as pH, conductivity, spreadability, viscosity, primarily screening techniques for particle size range and in-vitro drug release studies was performed. Santalum album biopolymer was obtained dark brown in color and percentage yield was found $3.0\% \pm 0.29\text{w/w}$. The biogels pH lies between 6.3-6.8, viscosity 5479-5513cps, spreadability 7.5-8.3g.cm/s, conductivity 0.1-0.4ms, particle size between 205-289 micron and 1325- 1599 sub-nano level, T50% 3.32 to 4.65 hours, T80% 21.42 to 24.87 hours and % drug release 75.76%-90.34%. The conclusion was drawn that NG2 was found to be the most effective formulation which depicted pH 6.6, viscosity 5517cps, spreadability 7.9g.cm/s, conductivity 0.1ms, drug release 75.76%, T50% 4.26 hours and T80% 25.30 hours with R2 value 0.9207 and Higuchi matrix was best fit model followed the super case II transport release mechanism.

OA-08: Development of Paediatric- friendly Multi-drug Polymeric Nanoparticles loaded patches for the management of AIDS and Tuberculosis

**PROF. (DR) V KUSUM DEVI*, MRS.
MAHIMA MATHUR**

**AL- AMEEN COLLEGE OF PHARMACY,
BANGALORE, KARNATAKA-560027**

E-mail: drkusumdevi@gmail.com

AIDS is a widely prevalent disease affecting paediatric population and its treatment is challenging due to age related barriers, lack

of efficacy of anti-retroviral (ARV) drugs and other drug related issues. Additionally, a majority of paediatric population also becomes susceptible to acquire tuberculosis as a secondary complication. A patient friendly dosage form is the need of the hour as a part of effective ARV therapy of WHO. To achieve this, ARV drugs loaded nanoparticles were designed, formulated, evaluated and characterized. Nanoprecipitation and double emulsification methods were used to prepare nanoparticles with particle size of <300 nm and entrapment efficiency of $>60\%$. Optimisation studies by factorial design software confirmed a spherical and smooth surface morphology as well as compatibility with excipients. These nanoparticles exhibited ex-vivo permeation for 24 hours across sheep mucosa. The same was confirmed by significant uptake in Hela cell lines as compared to pure drugs. As a further extension to this study, these nanoparticles were loaded in buccal patches which were prepared using HPMC E15 as a mucoadhesive polymer along with plasticizers. Buccal patches were evaluated for various technological parameters. Further, in-vitro and ex-vivo drug release studies were also conducted to understand drug release pattern and permeation, which was further validated by uptake studies in A 431 cells.

OA-09: Development of Mucoadhesive Oral Dosages Form Containing Amoxicillin Trihydrate And Ranitidine Hydrochloric Acid For The Treatment Of Helicobacter Pylori Infections

SOLANKI RICHHA*, DANGI YUVRAJ

SAGAR INSTITUTE OF PHARMACEUTICAL SCIENCES, SAGAR, MADHYA PRADESH-470001

E-mail address: richasolanki84@gmail.com

The present investigation was aimed to formulate mucoadhesive tablets of ranitidine and amoxicillin as Mucoadhesive tablets in general have the potential to be used for controlled release drug delivery. Mucoadhesive tablets of ranitidine and amoxicillin were prepared by wet granulation technique using different concentration of Guar gum and microcrystalline cellulose and evaluated for physicochemical parameters like thickness, hardness, friability, %drug content, swelling studies, dissolution time. Five batches of mucoadhesive tablets were prepared using different concentrations of Guar gum and microcrystalline cellulose. Tablets of F3 formulation combination of Guar Gum and Microcrystalline cellulose with PVP show better in vitro drug release than the other formulation and show good mechanical strength. Tablets of F3 formulation show acceptable range of weight variation, hardness, thickness, friability and drug content as per pharmacopeia specification. F3 formulation show good drug release and better swelling index property. It was concluded that mucoadhesive dosage forms have a high potential of being useful means of delivering drugs to the body for topical or local administration, the phenomenon of mucoadhesion can be used as a model for the controlled drug delivery approaches for a number of drug candidates.

OA-10: Development and Optimization of Nanovesicular system for topical therapy of skin

related disorder

DR. MD. HABBAN AKHTER*

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, UTTAR KHAND-248009

E-mail: habban.akhter@dituniversity.edu.in

The investigation of formulation optimization of nanovesicular system bearing herbal extract from *N. sativa* for effective topical delivery in skin related disorder. The optimization process followed Box-Behnken design for the parameter of vesicle size, encapsulation efficiency, and steady state flux (fluxss). The evaluation of optimized formulation involved the anti-inflammatory, anti-microbial and acne scars on skin and in vitro skin irritation test. The optimized formulation had shown vesicle size of 115.23 ± 14.21 nm, entrapment efficiency 90.270 ± 7.12 % and fluxss was 71.20 ± 4.6 $\mu\text{g}/\text{cm}^2/\text{h}$. The probe of the skin penetration of rhodamine loaded formulation was identified by CLSM study and compared with rhodamine solution. The penetration depth of rhodamine solution was 12.52 μm on skin, and formulation had shown penetration upto 105.64 μm . Antimicrobial study demonstrated 21.33 ± 0.97 mm zone of inhibition following administration of herbal extract loaded nanovesicle against *S. aureus* over other formulation. The anti-inflammatory activity exhibited inhibition of rat paw edema by 85.54 % and 81.24 % in rat by diclofenac cream and developed vesicle. The skin irritation study investigated formulation was safe and well tolerable for topical delivery and the anti-acne study revealed significant effect on reducing acne scars on the skin. The developed formulation could be effectively used in skin related disorder.

OA-11: Lipid-Polymer

Hybrid Nanosystem Designed For Synergistic Drug Delivery for Solid Tumor Management

DR. MADHU GUPTA*

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH, MEHRAULI, NEW DELHI-110017

E-mail: madhugupta98@gmail.com

Efficient dual targeted chemotherapy is an attractive approach for killing the tumor cells and tumor endothelial cells, while sparing the normal tissue. Herein, we investigated whether encapsulation of paclitaxel (PTX) within polymer-lipid hybrid nanoparticles conjugated with kNGR (PLNs-kNGR) achieved this goal in a subcutaneous tumor induced Balb/c mice bearing HT-1080 tumor model with nanocarrier-modified biodistribution and toxicity. The dual targeted PLNs-kNGR was prepared by modified nano-precipitation technique combined with self-assembly and evaluated for different parameters. Compared with other tested NPs, PLNs-kNGR-NPs revealed more cytotoxicity by inducing more apoptosis, higher intracellular uptake and % tumor volume inhibition rate that was 59.7%. These findings substantiate the importance of rational design of nanoparticles for dual targeting synergistic therapy. As a consequence, the PLNs-kNGR-NPs play a key role in enhancing tumor therapeutic efficiency for treatment of CD13 receptor specific solid tumor.

Keywords: kNGR peptide, CD13 receptor, targeted therapy, polymer lipid hybrid nanoparticles, intracellular delivery

OA-12: Influence of Electrical Field during Crystallization on Electrochemical Properties of Paracetamol.

MANE MONICA MANE*, GAIDHANE AK, WADHER KJ, MESHRA MR, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA-441002

Email: monicamane20@gmail.com

The aim of present study is to investigate the influence of electrical field during crystallization on Electrochemical properties such as, dielectric constant, zeta potential and oxidation and reduction of paracetamol. The ENS-crystals of paracetamol was prepared by using electro crystallization method. The saturated solution of paracetamol was prepared by using double distilled water in electro crystallizer. DC electrical field was used. Prepared crystals was kept in specific temperature condition and then characterization of crystals was carried out. The control sample of paracetamol crystals was prepared using the same procedure without exposure to the electrical field. The dielectric constant increases with the increment in the duration of DC electric field exposure from 1 to 6 min. The zeta potential of paracetamol ES-crystals is significantly enhanced than the zeta potential of the control sample. Crystallization under electrical field results in strong negatively charged particle surface, which creates a high stern layer and the diffuse layer of positive charges when the particles are suspended in the saturated solution. As evident from the present work, crystallization of a drug under electrical field of varying duration of exposure from 1-6 min brings about

enhancement of electrochemical properties viz oxidative potential, charges, zeta potential, and dielectric constant of paracetamol.

OA-13: Design and Development of Stealth Nanoliposomal Formulation of DMARDs For Effective Management Of Rheumatoid Arthritis

DR. SUSHAMA TALEGAONKAR*

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH, MEHRAULI, NEW DELHI-110017

Email: stalegaonkar@gmail.com

Nanoliposome formulation was prepared by using film hydration method and further coated with mPEG2000-DSPE. Prepared nanoliposome (PEG-lipo) were characterized for vesicle size, zeta potential, surface morphology and DSC analysis. The long circulating nanoliposomes were further subjected to in vitro release and cell line studies on RAW 264.7 murine macrophage and U937 human macrophage cell lines. PEG-lipo were further evaluated for pharmacodynamic parameters on the Collagen-induced arthritis (CIA) rat model. Vesicle size of PEG-lipo was found to be in the range of 131- 155 nm and DSC thermogram showed that drug is encapsulated in the lipid matrix in amorphous state. PEG-lipo showed a sustained release pattern even after 24 h. PEG-lipo showed higher cytotoxicity in comparison to TEF solution (($p < 0.05$)) in U937 cells. The IC₅₀ of TEF solution, Blank-lipo and PEG Lipo was found to be 62.78 µg/ml, and 8.54 µg/ml and 14.2

respectively. Pharmacodynamic study showed effective results on arthritic rat model. Results demonstrated that developed nanoliposomal formulation will provide effective way for the treatment of RA due to their longer residence time in systemic circulation which could help them reaching the target tissues and hence limit the drug associated side-effects.

OA-14: In Vitro Cytotoxicity, Apoptosis, Cell Cycle, In Vitro Mitochondrial Membrane Potential and Pharmacokinetics Assessment of Modified Polysaccharide Based Liquisolid Formulation of Paclitaxel.

SHARMA VIJAY*, BHALLA VIJAY, PATHAK KAMLA

SGT COLLEGE OF PHARMACY, SGT UNIVERSITY, GURUGRAM - 122505 (HARYANA)

Email : drvijay.pharmacy@sgtuniversity.

The research was aimed to develop liquisolid formulation of paclitaxel using modified polysaccharides, with large specific surface area and high liquid load factor. Modified polysaccharides were developed by subjecting selected polysaccharides to wetting, drying and co-grinding with mannitol (1:1) sequentially. A total of 2 liquisolid systems of paclitaxel (LSP-1 to LSP-12) using non-volatile solvent, modified polysaccharides, and Aerosil® 200 as coating material, were formulated, and directly compressed to produce liquisolid tablets (LTP-1 to LTP-12) and assessed for post compression parameters, cytotoxic/cellular analysis and

pharmacokinetic behavior. Results: Among the directly compressed liquisolid tabs, LTP-10 exhibited highest CDR of $98.70 \pm 2.68\%$ and permeability of 61.59% . The IC_{50} of <20 mmol/L indicated remarkable cytotoxic potential on human gastro-enteric tumor cancerous cell lines (NCI-N87). Additionally, LTP-10 exhibited significantly higher values for cell death 37.92 and 54.17% ($P < 0.01$) in early and late apoptosis and mitochondrial membrane potential regain (33%) over paclitaxel ($P < 0.05$) and 5-Fluorouracil ($P < 0.01$). Pharmacokinetics revealed C_{max} of $536.48 \pm 4.63 \mu\text{g/L}$ at 1.64 ± 0.44 h (enhanced by 5.43 fold) for LTP-10, claiming superior pharmacokinetics of paclitaxel. LiquiSol Tabs were stable during the experimental test period and has strong potential for commercialization once clinical intricacies have been addressed.

OA-15: Design And Development Of Sterically Stabilized Liposome Of Anticancer Drugs

PROF. DASHARATH M. PATEL*, PATEL NITESH N.

ARIHANT PHARMACY SCHOOL & BIO-RESEARCH INSTITUTE, GANDHINAGAR, GUJARAT-382421

E-mail: drdmpatel1971@gmail.com

Anticancer Nano therapeutics must not contain only nano scale but should find their way to the solid tumor via active or passive targeting. Pegylation on the surface of liposome helps them to become long circulating and passive targeting to tumor. They allow controlling the pharmacokinetics and biodistribution of the drugs by uniform time and spatial co-delivery of these agents. However, successful

translation of such complex formulations into the clinic relies on understanding critical physicochemical characteristics. Important findings: We encapsulated the vincristine (VCR) and topotecan (TPT) in Nano liposome with pegylation on the surface resulting in to long circulating stealth liposomes. Nano liposomes were remotely loaded with both the drugs by transmembrane gradient method. They were characterized for membrane phase and dynamics, size distribution, state of encapsulated drug, internal environment of liposome, state of grafted polyethylene glycol at the liposome surface, and in-vivo drug release rate. These determine the pharmacokinetics of the formulation and the bioavailability of the drugs. In vitro characterization of both the liposomes provides an explanation for the good therapeutic efficacy to tumor cell. This characterization is an important step for a rational clinical development.

OA-16: Formulation and evaluation of natural polymer based mucoadhesive buccal films for controlled drug delivery

SABALE VP1, KHADE AV1, SABALE PM

DADASAHEB BALPANDE COLLEGE OF PHARMACY, NEAR SWAMI SAMARTH DHAM MANDIR, BESA, NAGPUR-440037

Email: vidyasabale@yahoo.co.in

The major objective of the present study was to explore the mucoadhesive and controlled release potential of natural mucilage. The mucilage was isolated from the Mimosa pudica seeds using water extraction method and its various physiochemical parameters

and adhesive properties were determined. A novel buccal film based on mucilage obtained from seeds of Mimosa pudica was formulated using Metoprolol succinate as a model drug and characterized for various evaluation parameters. Spectral studies established the compatibility of natural polymer. Films containing natural mucilage (preliminary trial batches) showed prolonged drug release comparable to hydroxypropyl methylcellulose and ethyl cellulose. The formulated buccal films showed satisfactory permeability flux (0.4048 ± 0.081 mcg*cm⁻²*h⁻¹ for HF3 and 0.1036 ± 0.017 mcg*cm⁻²*h⁻¹ for MF3). Optimization of the formulation was carried out using response surface method supported by 23 factorial design. The optimized mucoadhesive buccal films (C2) showed swelling index of 86.12 ± 0.041 , mucoadhesive strength of 32.25 ± 0.251 mg and in vitro drug release of 51.330 ± 0.119 % at 8 h. Similarity factor was found 90.2. The stability study indicated the stability of formulation and non-irritant nature of the formulation was observed from the histological study of buccal mucosa.

OA-17: Preparation and evaluation of solid dispersion of carbamazepine using co-rotating twin screw processor

KOTESHWARA KB, KANANGI PADMASHREE, MUTALIK SRINIVAS

MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES, MANIPAL ACADEMY OF HIGHER EDUCATION, MANIPAL 576104

Email: kb.koteswara@manipal.edu

The present study demonstrates the development of solid dispersions of a poorly soluble drug carbamazepine, carried out by

the Co-rotating Twin- screw processor. It was observed that hot melt extrusion technique using co-rotating twin screw processor was useful in the solubility enhancement of carbamazepine. The solid dispersions of carbamazepine were prepared by this unique technology at different ratios of drug and different carriers such as polyethylene glycol (4500 and 6000), polyvinylpyrrolidone, and Soluplus. The solid dispersions were prepared by varying screw speed and temperature of the barrel. The solid dispersions were evaluated for solubility, dissolution rate, differential scanning calorimetry, FTIR spectroscopy and x-ray diffraction studies. The solid dispersions of carbamazepine using Co-rotating Twin screw processor technique has enhanced the solubility of carbamazepine by 3 folds and thereby achieving the successful development of poorly soluble drug formulation. These solid dispersions also showed increase in dissolution rate of the drug compared to pure drug.

OA-18: Development and evaluation of beta-cyclodextrin complexes of carbamazepine using co-rotating twin screw processor

MANNE ALEKHIA, HEGDE AR, RAUT SY, MUTALIK SRINIVAS*

MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES, MANIPAL ACADEMY OF HIGHER EDUCATION, MANIPAL 576104,

Email: ss.mutalik@manipal.edu

In the present study, beta-cyclodextrin complexes of carbamazepine (CBZ – β -CD) were prepared using co-rotating twin screw processor and evaluated with respect to various

parameters. Drug excipient compatibility studies carried out using FTIR and DSC revealed that there was no incompatibility between the drug and excipients used in the preparation of complexes. Complexes prepared using twin screw processor were optimized with respect to screw speed, temperature of barrel, pH of media used and molar ratio of drug and cyclodextrin. Optimized complex showed nearly 17 times more solubility as compared to plain CBZ. The complexes were also evaluated for in vitro drug release studies and the results indicated greater drug release in the complexed form in comparison with plain drug. The complexes were characterized using FTIR, differential scanning calorimetry and x-ray diffraction studies. All the studies indicated the successful formation of the inclusion complexes. The drug was present in amorphous form when complexed with β -CD. All these results suggested the greater efficiency of co-rotating twin screw processor in the preparation of drug- β -CD complexes which resulted in enhanced solubility and dissolution rate of the drug.

OA-19: Design and characterization of nanocrystals of cefuroxime axetil for improved bioavailability

SINGH APURWA*, YADAV SHIPRA, CHAUDHRI SANJIV K, SARAF SHAILENDRA K

FACULTY OF PHARMACY, BABU BANARASI DAS NORTHERN INDIA INSTITUTE OF TECHNOLOGY, LUCKNOW-226028

Email: s.apurva10@gmail.com

Cefuroxime axetil is a second generation cephalosporin ester prodrug belongs to BCS class II, having poor water solubility and high permeability. This study intended to develop novel formulation nanocrystals of Cefuroxime axetil for enhancement of water solubility and dissolution rate of drug so that higher bioavailability can be achieved. Cefuroxime axetil nanocrystals were prepared by antisolvent precipitation method and lyophilized to obtain dry powder of nanocrystals and characterized by SEM, polydispersity index (PDI), zeta potential, solubility, in vitro dissolution, in vivo bioavailability and stability studies. The Central Composite Design was used for the optimization of batch. F5 was selected as optimized formulation having 141.0 nm particle size, 0.223 PDI and -58.9 zeta potential. SEM was also studied for the determination of surface morphology of nanocrystals and particle size estimation. The saturation solubility was found to be 0.72mg/mL. The antibacterial activity of optimized batch was performed on both gram-positive and gram-negative bacteria, S. aureus and E. coli. and nanocrystals of cefuroxime axetil were found to be more effective compared to pure drug. From the above study it was concluded that cefuroxime axetil nanocrystals were having more bioavailability and enhanced solubility through oral administration in comparison to the pure drug.

OA-20: Green synthesis of silver nanoparticles of Momordica charantia and its evaluation for antidiabetic potential

PETHE ANIL M, HALDER RUPSA

**SHOBHABEN PRATAPBHAI PATEL SCHOOL OF
PHARMACY & TECHNOLOGY MANAGEMENT,
SVKM'S NMIMS MUMBAI-400056**

Email: anilpethe@gmail.com

In the present investigation silver nanoparticles of Momordica charantia was prepared by green synthesis. The prepared silver nanoparticle was then characterized by UV, FT-IR, particle size and zeta potential, TEM, entrapment efficiency and in vitro drug release. The UV results confirmed the formation of silver nanoparticles. The entrapment efficiency of was found to be 77.21% and TEM results confirmed the spherical shape of the particles and particle size analysis suggested the size range of nanoparticles from 200-450 nm. The prepared AGNPM was then evaluated for in vivo antidiabetic activity by using streptozotocin induce diabetic rats. The results revealed the significant antidiabetic potential of silver nanoparticles of Momordica charantia prepared by green synthesis. Thus, it can be concluded that, the silver nanoparticles of plant based extracts could be potentially explored as cheap alternative to control the diabetes.

OA-21: Formulation and evaluation of herbal mascara

**OJHA ABHIJEET*, SATHEESH MADHAV
NV, BHASIN SHIVANGI**

**FACULTY OF PHARMACY, DIT UNIVERSITY,
MUSSOORIE, DIVERSION ROAD,
DEHRADUN-248009, UTTARAKHAND**

Email: ojhaabhiijeet24@gmail.com

Mascara is a cosmetic preparation commonly used to enhance and beautify the eyelashes. It may darken, thicken, lengthen, and/or highlight the eyelashes. It can be in one of three forms- liquid, cake, or cream. The modern mascara product has various formulas; however, most

contain the same basic components of pigments, oils, waxes, and preservatives. The current aim of our research work is to make an herbal formulation of mascara which is not harmful for our eyes. In this research work different types of oils like coconut oil, mustard oil, olive oil, and various herbal ingredients like turmeric powder, beetroot, coffee and coconut black were used for the preparation of herbal mascara. Ten formulations coded with MC1 to MC10 were prepared. The prepared formulations were evaluated for various parameters like pH, solubility, spreadability, grittiness, colour, colour retention capacity and irritancy. The results were compared with the standard marketed formulation. Our experimental results revealed that the formulations MC5 was found to be non-irritant, non-gritty, slightly soluble with good spreadability and high colour retention property. Moreover, the formulation showed the pH of 6.5 to 8; making it fully compatible with eyelashes.

OA-22: Development and evaluation of newly generated delivery system for the treatment of psoriasis

**SINGH ATUL PRATAP*, EASWARI.T.S
IIIMT UNIVERSITY, MEERUT**

E-mail: atulsingh2206876@gmail.com

Psoriasis is an autoimmune chronic inflammatory topical disease. Previously through many systems like unani, siddha, etc trying to treat this disease but mostly every system found only they can cure not treat. In this disease phagocytic reaction starts and result will be cell death. We are going here to do work for making new delivery

system that will work topically and stop our problem statement which is covering psoriatic problem. In this studies we are trying to make a bandage that will fully layered by many of the herbal material those will help to suppress the growth. The content of herbal ingredient will be using nano particle size that will be layered with bandage. After this we are using to develop an spray(containing solvent with immunomodulator and other herbal volatile oil) and bind manufactured badage on infected areas sprayed time to time, permeability will increase . It will be shown as a therapy but it is new delivery system. Formulation evaluated with many parameters pH,viscosity, spreadability permiabily and antimicrobial studies. Preclinical performed by the using of mice in the lab.Formulation for layered bandages prepared with using nano-technology and good commence acquirement, solvent is also prepared by evaporation techniques for spray. Permiabily was good shown on preclinical studies. All the parameters of evaluation were expected. pH was maintained with good viscosity level and microbial studies done no colonies found.

OA-23: Formulation and evaluation of fast dissolving tablets of Nebivolol hydrochloride

**SHUBHAM MISHRA*, HARISH
CHANDRA**

**FACULTY OF PHARMACY, DIT UNIVERSITY,
DEHRADUN-248009, UTTARAKHAND**

Email: shubham.ms331@gmail.com

The aim of this research is formulation and evaluation of fast dissolving tablet of nebivolol hydrochloride using solid dispersion technique.

Solids dispersion was prepared by solvent evaporation method. Nebivolol hydrochloride and carrier (PEG 6000) were taken in drug-carrier ratio of 1:1, 1:2, 1:3, 1:4 and 1:5. The solid dispersion were screened through sieve no. 120 and subjected for compression into tablets. Tablets were formulated by direct compression method. The formulations were evaluated for various parameters such as disintegrating time, hardness, friability and wetting time and in-vitro drug dissolution studies and the % drug release was calculated for minutes at interval of 5 minutes. A test formulation was also formulated without solid dispersion technique. All formulations were subjected to in-vitro drug release studies. The result of study reveals a significant increase in % drug release with the tablet prepared with solid dispersion.

OA-24: A research paper on moxidectin macrocyclic lactone derivative

DAHIYA A*PATHANIA R, BODLA RB.,

DELHI INSTITUTE OF PHARMACEUTICAL
SCIENCES AND RESEARCH, PUSHP
VIHAR-TI0017, NEW DELHI

Email: dahiyaaman223@gmail.com

Moxidectin is an anthelmintic drug used in animals to prevent or control parasitic worms, such as heartworm and intestinal worms. Moxidectin is newly approved by USFDA in June 2018. Moxidectin is a macrocyclic lactones derivative are probably the anti-parasitic agents most widely used in the treatment of food producing animals, poultry, aquaculture and crops. A number of alternative products such as abamectin, doramectin, emamectin, eprinomectin, milbemyein and selamectin, have been marketed since. The increase in

the number of macrocyclic lactones drugs, there has been a steady increase in the number of published analytical methods for determination of their residues. Methodologies for determination of moxidectin residues in biological matrices are described in terms of extraction and clean-up methods used for different matrices. Detection systems for determination of moxidectin residues are discussed with a particular emphasis placed on new developments in screening technologies and different chromatography with fluorescence or mass spectrometry.

OA-25: Formulation and Evaluation of Rosiglitazone Loaded Bio-Films from Pinus Roxburghii Seeds Biopolymer

DR.HARISH CHANDRA*

FACULTY OF PHARMACY, DIT UNIVERSITY,
DEHRADUN, INDIA

harish.chandra@dituniversity.edu.in

The aim of present research work is to develop drug loaded biofilms using a novel biopolymer for trans-cutaneous drug delivery. The biomaterial was isolated from Seeds of Pinus roxburghii by simplified economic process. Isolated biopolymer was used to formulate drug loaded biofilms using Rosiglitazone as a model drug by simple solvent casting method. Using varying concentration of isolated biomaterial four biofilms PRR1, PRR2, PRR3 and PRR4 were formulated. A rosiglitazone loaded standard film PCR4 was also formulated using polycaprolactone. Rosiglitazone loaded test and standard films were evaluated for various properties such as % swelling index, % moisture absorption, % moisture loss, WVTR, pH, thickness, drug content, weight uniformity,

folding endurance and in-vitro drug diffusion study and results are compared. Based on in-vitro drug diffusion study PRR2 was found to be the best among all test formulations. PRR2 was further compared with Rosiglitazone loaded standard film PCR4 and performance of PRR2 was better than Rosiglitazone loaded film PCR4. Results of the study revealed that Pinus roxburghii biopolymer has produced stable, uniform biofilms with good drug loading efficiency, optimum flexibility, physical strength and drug release retardant properties.

OA-26: Smart Hydrogel Nanomembranes for Wound Healing

SINGH AARTI*, SHAKEEL A, RAJPUT SK,
MUKHERJEE M

AMITY INSTITUTE OF CLICK CHEMISTRY
RESEARCH & STUDIES, AMITY UNIVERSITY,
NOIDA, U.P.- 201303

Email: aartibsp90@yahoo.com

The objective of this research was to formulate and evaluate physically crosslinked, smart hydrogel nanomembranes as an effective wound dressing for enhanced wound healing and sustained release of a drug. The hydrogel nanomembranes were successfully developed by free radical aqueous copolymerization technique, using Acrylic acid (AAc) and 2-(dimethylamino)ethyl methacrylate (DMAEMA) as monomers and water as a solvent. Further, the prepared nanomembranes were characterized for their morphology (SEM and TEM), swelling characteristics, drug-release efficacy, biocompatibility, immunological assessments and wound healing capability. The hydrogel nanomembranes displayed a uniform mesoporous, honey-



comb like architecture with a nano-to-micro hierarchical pattern. A closer inspection at the nanoscale revealed nanosheets formation by the self-assembly of amphiphilic polymeric chains. These hydrogel nanomembranes exhibited excellent swelling properties in response to simulated physiological pH (pH 7.4) over 24h and sustained release ~25h. Bequeathed with excellent biocompatibility, the as-synthesized hydrogel nanomembranes promoted rapid wound closure. The results obtained in this research work clearly indicated a promising potential of pH-responsive hydrogel nanomembranes for sustained and controlled release for effective and enhanced wound healing and anti-inflammatory application.

OB-01: Antiamnesic and neuroprotective potential of Mimusops elengi in mice model of scopolamine induced amnesia

JAYARAMAN RAJANGAM*, B. HIMA BINDHU, ANNA BALAJI

DEPARTMENT OF PHARMACOLOGY, SREE VIDYANIKETHAN COLLEGE OF PHARMACY, A. RANGAMPET, SREE SAI NAGAR, TIRUPATI, ANDHRA PRADESH - 517501

Email: jayaraam81@gmail.com

The present study was aimed to investigate the cognitive and protective potential of Methanol extract of Mimusops elengi (MEME) on Scopolamine induced amnesia in mice. Cognitive skills were examined after the induction of amnesia by using elevated plus maze (EPM), Morris water maze (MWM) whereas blood serum and brain tissue homogenate were used to analyze the biochemical, antioxidant

parameters. In the EPM model, Scopolamine received animals showed a significant increase in transfer latency on day 14 and 21 when compared to control animals. Whereas Donepezil (4 mg/kg, p.o) and MEME received animals showed a significant decrease ($p < 0.05$) in the transfer latency period when compared to Scopolamine treated animals. In the MWM test, MEME treatment showed a significant decrease in escape latency period ($p < 0.05$) when compared to Scopolamine treated animals. The results confirm that, Scopolamine impaired learning and memory process in animals, whereas administration of MEME significantly ameliorated scopolamine-induced amnesia in both elevated plus maze and Morris water maze test as indicated by significant reduction ($p < 0.05$) in transfer latency (TL) ($p < 0.05$) and escape latency (EL) respectively. Results from the biochemical analysis showed significant ($p < 0.05$) amelioration of scopolamine-induced amnesia, hence it can be concluded that MEME possesses significant cognitive and protective property against scopolamine-induced amnesia in mice.

OB-02: An experimental study of virgin coconut oil and sunflower oil in colchicine- induced dementia in rats

SHENOY RR*, JOHN J, KUMAR SN

DEPARTMENT OF PHARMACOLOGY, MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES, MANIPAL- 576104

Email: rekha.shenoy@manipal.edu

Virgin coconut oil, unlike other dietary oils, contain medium chain fatty acids which are

absorbed and easily metabolised by the liver to form ketone bodies, which are converted to acetyl co-A in the brain, that enters the citric acid cycle to provide ATP and also serves as the precursors of acetylcholine in neurons. Sunflower oil contains PUFA which has both anti-inflammatory and neuroprotective actions. In this study, we induced dementia through intracerebroventricular injection of colchicine after giving the diet enriched virgin coconut oil and sunflower oil in rats for 60 days. Rats were sacrificed on the 22nd day after the administration of colchicine. Behavioural parameters were assessed during the study period and biochemical estimations were performed using frontal cortex and hippocampus isolated from rat brain. Virgin coconut oil reversed the antagonistic effects induced by colchicine by decreasing the acetylcholinesterase and malondialdehyde levels and increasing the levels of catalase and superoxide dismutase. Sunflower oil only reduced malondialdehyde levels in cortex and hippocampus. The medium chain fatty acids and polyphenols present in virgin coconut oil showed better neuroprotective effects compared to the polyunsaturated fatty acids in the sunflower oil in reversing cognitive impairment.

OB-03: Neuroprotective effect of harmine against 3-nitropropionic acid induced neurotoxicity in rats

KUMAR P*, CHANDOLIA P, ARORA A

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, BATHINDA, PUNJAB -151001

Email: priyankachandolia42@gmail.com

Huntington disease (HD) is a devastating, autosomal dominant inherited neurodegenerative disease characterized by progressive motor, behavioral, and cognitive decline. Enhancing glutamate transporter (GLT) expression has been reported to be beneficial in neurodegenerative disorders. Harmine has been documented to possess wide spectrum of pharmacological actions, including upregulating GLT, anti-oxidative action and neuroprotective potential in various animal models of neurological disorders. The present study was designed to investigate the effects of Harmine in 3-Nitropropionic acid (3-NP) induced neurotoxicity in rats. 3-NP was administered for 21 days (10 mg/kg i.p.) in rats and these animal were treated with vehicle or different doses of harmine (10, 20 and 40 mg/kg p.o.). Harmine treatment attenuated 3-NP induced behavioral and biochemical alterations. Among the doses selected, harmine (10 & 20 mg/kg p.o.) was observed to be most effective in improving rotarod, transfer latency, time taken to cross the beam and locomotor activity in rats. Further, harmine significantly attenuated oxidative stress in 3-NP treated rats. The outcomes of present study suggest that harmine is beneficial and might emerge as an adjuvant or prophylactic therapy for 3-NP induced neurotoxicity in rats.

*OB-04: Effect of *Gymnema sylvestre* on Insulin, GLP-1R and DPP4 Gene Expression Levels in Streptozotocin Induced Diabetic Rats*

KILARI EK*, PUTTA S AND KORATANA R

DEPARTMENT OF PHARMACOLOGY,
A.U.COLLEGE OF PHARMACEUTICAL

SCIENCES, ANDHRA UNIVERSITY-530003

E-mail: ekilari@gmail.com

The aim of the present study was to determine the effect of aqueous extract of *Gymnema sylvestre* (AQGS) on antihyperglycemia, in vivo antioxidant, hepatic and lipid biomarkers and gene expressions in streptozotocin induced diabetic rats. Albino Wistar rats were induced for diabetes by streptozotocin and divided into five groups as vehicle control (group I), disease control (group II), gliclazide (Group III), group IV, and V received AQGS 50 and 100mg/kg body weight respectively orally once a day for 28 days in STZ induced diabetic rats. A significant increase in blood glucose, glycosylated hemoglobin (HbA1c), altered Lipid profile and elevated hepatic serum biomarker levels in STZ induced diabetic rats. The AQGS showed significant reduction of blood glucose and HbA1c and elevation of insulin levels, normalize the lipid and hepatic biomarkers in STZ induced diabetic rats. Decreased levels of in vivo antioxidant enzymes SOD, CAT, GSH and GPx in both pancreas and ileum, decreased insulin & GLP-1R and increased hepatic DPP4 mRNA gene expression levels in STZ induced diabetic rats. Treatment with AQGS shown to elevate the pancreatic and intestinal antioxidant enzymes and increased pancreatic insulin & GLP-1R gene expression in ileum and decreased hepatic DPP4 in STZ induced diabetic rats. The pharmacological activity of the AQGS might be due to the antioxidant property and by enhancing the incretin activity.

Key words: *Gymnema sylvestre*, Streptozotocin, Diabetes mellitus

*OB-05: An investigation of *Didymocarpus pedicellata**

and Di-methylamino ethyl methacrylate hybrid hydrogel for wounds management

BHARDWAJ ROHIT*, SHARMA RIYA, DR. RAJPUT S.K

AMITY INSTITUTE OF PHARMACY, AMITY UNIVERSITY, NOIDA - 201313

E-mail: rohitbhardwaj.aip@gmail.com

Wound is major health problem associated with skin damages and arise due to various types of injuries included cut, a blow, or other broken wound. Wound in diabetes takes relatively long time to heal and sometimes healing does not occur. Wound healing mechanism included coagulation, inflammation, proliferation and migration of cells, angiogenesis and matrix deposition after injury. Furthermore, various inflammatory mediators are involved including cytokines and growth factors like IL-1b, TGF-b, and TNF. Angiogenesis is also common process for the entire wound healing to final scar formation included excessive neo-formation of blood vessels. Wound is measure by histological assessment, measurement of wound contraction, biochemical parameter. The hydrogel can be used with the herbal drugs to measure effect on wound healing and managements of wounds. The hybrid hydrogel development is studied with the herbal drugs and seen their effect on wound healing. In traditional Indian medicines for renal afflictions *Didymocarpus pedicellata* (family Gesneriaceae) is commonly used. Current study was performed with *Didymocarpus pedicellata* and FDA approved polymer DMAEMA hydrogel for the treatment of wounds and well characterized by the spectroscopic and

microscopic features such as UV study and FTIR and SEM.

OB-06: Investigation of the novel apparatus for learning and memory testing in Wistar rats

YOGESH CHAND YADAV*

PRIMARY SCHOOL OF SIPAH IBAHIMABAD,
MAU, UP-275101

E-mail: drycy31@gmail.com

To investigate a novel apparatus for learning and memory testing in wistar rats. Material and method: A novel rectangular apparatus was designed and 60 to 120 gram young either sex rats were used this study. Rats were divided three groups and each group consists of six rats. Group I (Control group) was received normal saline 1 ml intraperitoneal (i.p.), group II (Scopolamine treated) was received scopolamine 3 mg/kg i.p. and Group III (Diazepam Treated) was received diazepam 1mg/kg i.p. route. Learning and memory of rats were tested after 30, 60, 120, 180 minutes of the injection of each groups. Group I (Control group) rats reached from starting point to target point means transfer latency time (TLT) was 5 to 9 second and scopolamine treated group showed increase TLC after 30 minute to 60 minute and then decreased simultaneously 120 and 180 minutes. Whereas Group III (Diazepam Treated) showed highly increase TLT after 30 minute and then decreased simultaneously after 60, 120 and normal TLT after 180 minutes. Finally it can be concluded that rectangular apparatus has been justified objective of the learning and memory testing of rats and it can be also used for evaluation of memory enhancement activity of drugs.

Keywords: Novel apparatus, learning and memory testing

OB-07: Prevalence, Risk Factors and Medication of Pregnancy Induced Hypertension in Uttarakhand

SINGHAL MANMOHAN*, RATURI DIVYA

FACULTY OF PHARMACY, DIT UNIVERSITY,
DEHRADUN-UTTARAKHAND-248009

Email: manu.research2@gmail.com

Preeclampsia is the condition of pregnancy complication which is characterized by increase in blood pressure and signs of damage to different organ system, most often liver and kidneys. Preeclampsia usually arises after the 20 weeks of pregnancy in the women whose blood pressure had been normal. The main objective of the present study was to find out the number of women having hypertension during pregnancy and the management of hypertension in pregnancy. The survey was conducted on the pregnant women of various regions of the Uttarakhand and in this survey the pregnant women were given questionnaire based on general questions related to their life style and conditions during the pregnancy period. After the data was collected, data interpretation and analysis was done to get the idea and overview on the current scenario of this condition of hypertension which was induced during the phases of pregnancy. In my study I found that 18 percent women were suffering from pregnancy induced hypertension. Their life style parameters like exercise, smoking and alcohol habit was also recorded. We also

recorded other complications of pregnancy. It was observed the more than 75 percent cases of pregnancy were in age of less than 30 years. Preeclampsia is very serious complication in pregnancy and it should be managed.

*OB-08: Probing Effects of Carbazole Alkaloids Isolated from *Murraya Koenigii* on Metabolic Syndrome Induced by High Fat Diet and Dexamethasone*

KAVISHWAR SAMRUDDHI*, NAIR M, SANAYE M

PRINCIPAL K. M. KUNDNANI COLLEGE OF
PHARMACY, CUFFE PARADE, MUMBAI,
AHARASHTRA-400005

Email: samruddhi1380@gmail.com

The present study investigates the preventive effects of *Murraya koenigii* (MK) on dexamethasone and high fat diet induced Metabolic syndrome. Forty-two Sprague dawley rats of either sex (150 to 200 g) were randomly divided in 7 groups (n=6). All groups except normal control were treated with High fat diet (HFD) for first 21 days followed by administration of dexamethasone (s.c.) for later 21 days. Treatment with MK extracts (100, 200 and 400 mg/kg/day), alkaloid fraction (259.3 mg/kg) and standard Orlistat (200mg/kg/day) were given for period of 42 days. Serum biochemical parameters like glucose, cholesterol, triglycerides and HDL levels along with levels of Insulin, adiponectin, TNF- and IL-6 were performed. Antioxidant assay, BP and ECG were also recorded at the end of the study. The results showed a significant increase

in blood cholesterol and triglyceride levels as compared to the normal control which signifies the effective induction of Metabolic syndrome. Perturbations in other parameters like body weight, plasma triglycerides levels, total cholesterol levels, insulin levels, adiponectin, TNF- etc were significantly altered in toxicant group as compared to normal control. The overall results show that the symptoms of metabolic syndrome were found to be significantly attenuated in treatment with MK extract. The observed effect was found to be due to presence of carbazole alkaloids in MK. Thus, MK proves to be an alternative treatment for the management of MS.

OB-09: Investigation of Agmatine induced Imidazoline Receptor Activation within Hippocampus in Amyloid Plaque Mouse Model of Alzheimer's Disease

FATING RAJSHREE V*, CHAURAGADE SM, DIXIT MP, KOTAGALE NR, TAKSANDE BG, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA-441002

Email: rajshreefating23@gmail.com

Aim of present research was investigation of agmatine induced imidazoline receptor activation within hippocampus in amyloid plaque mouse model of Alzheimer's disease. Swiss albino mice (25-30g) were injected by intracerebroventricular injection of β -amyloid on 0th day. Development of

memory impairment was assessed by radial arm maze (RAM) and novel object recognition (NOR). Agmatine (8 μ g and 10 μ g/mouse) intrahippocampal and imidazoline I2-receptor antagonist idazoxan (0.25 and 0.5 mg/kg) intraperitoneally administered alone or in combination in beta amyloid treated mice for 14 days once daily and animals were subject to memory analysis on 28th by RAM and NOR. Further neurochemical estimation of mouse brain hippocampus was studied to estimate the level of TNF- α , IL-4, Nitrotyrosine, BACE1, MAPt, BDNF, Neprilysine, ADC, Agmatinase and APP. In NOR, all groups displayed reduced exploratory activity in test when animal became familiar with the environment and object. In the RAM beta amyloid treated group more working and reference memory error and this memory impairment is significantly attenuated by the (agmatine 10 μ g/mouse) and the memory facilitatory effect of agmatine is reversed by the idazoxan (0.5mg/kg) also agmatine alter the brain neurochemical level in account of learning and memory improvement. Present study projects agmatine as a potential therapeutic target for memory impairment by beta amyloid and might be act through imidazoline receptor.

OB-10: A Potential Efficacy of Taraxacum Officinale on DMBA induced Skin Papillomas in Mice

KAUSHIK MADAN*, SAXENA JYOTI, SINGH RANJIT

PHARMACOLOGY DEPT., AVIPS, SHOBHIT UNIVERSITY, GANGOH, SAHARANPUR, UTTAR PRADESH-247341

Email: kaushikmadan2011@gmail.com

The present study was designed to investigate the anticancer effect of Taraxacum officinale extracts on DMBA induced skin papillomas in Swiss albino mice. The plant Taraxacum officinale was collected, shade dried and powder, the dried material was extracted with petroleum ether, ethanol, and water in a successive manner. The mice were divided into 6 groups comprising of 5 animals in each group as Normal, Control, Standard Group (5mg/kg), Test Group-I, 200 mg/kg.p.o. petroleum ether extract, Test Group-II, 200 mg/kg.p.o ethanol extract and Test Group-III, 200 mg/kg.p.o. aqueous extract for anticancer activity. The parameters in relation to skin papilloma were observed in the Swiss albino mice like physiological, biochemical and morphological. The results indicate that significant recoveries were observed in body weight, tumor incidence, and tumor burden in all treated groups compared with the control group. All the treatment groups showed significant improvement in all biochemical parameters by restoring to normal level compared with control. The morphological study confirmed that all the treatment groups showed a significant reduction in tumor size and also in the number of tumor. Therefore, the ethanolic extract dose 200mg/kg of Taraxacum officinale showed anticancer effect. Keywords: Skin Papillomas, DMBA, Skin cancer, Taraxacum officinale

OB-11: A Survey on Prevalance And Drug Utilisation In Thyroid Disorders in Dehradun

ANUJ NAUTIYALI, NV.SATHEESH MADHAVI, HAVAGIRAY CHITMEI,

ABHIJEET OJHA1, SAMEER
BHARAGAVA1, RAJEEV KUMAR
SHARMA1, HARISH CHANDRA1, YUSRA
AHMAD2

FACULTY OF PHARMACY, DIT
UNIVERSITY, MUSSOORIE DIVERSION
ROAD, DEHRADUN, 2DEPARTMENT OF
PHARMACOLOGY, UTTARAKHAND TECHNICAL
UNIVERSITY (UTU), DEHRADUN - 248001

E-mail: anujnautiyal@rediff.com

Thyroid disorders is a condition that affects the thyroid gland. Our current research study focus on hypothyroidism and hyperthyroidism. A cross-sectional study was conducted in the different areas of dehradun, by team of volunteer using the suitable tested and pre-approved questionnaire. The study included the population size of 250 people, having age group 18 years and above. The survey was conducted on Saturday and Sunday for a period of total 20 days, as per time permitted. The exclusion criteria were patient suffering from any mental disorder, not able to talk, or severe bed ridden patient. It was found that out of 250 people 31 people were suffering from hypothyroidism and only 5 people were having the hyperthyroidism, were taking their medication as advised by their doctor. During the survey proper focus was given on counselling of patient, about their medication. In study female population was most affected by the thyroid disorder, out of 36 people affected by thyroid disorder, 23 females were suffering from thyroid disorder as compared to 13. The affected females, in our study was found to be in age group of 20- 55 yrs and males affected were in age group 60- 75. Two of male patients were also having diabetes along with thyroid disorder.

Keywords: Thyroid disorders, medication, counselling

OB-12: Maternal and neonatal complications during pregnancy in selected hospitals of Dehradun

HAVAGIRAY R. CHITME*, TINA DAS

FACULTY OF PHARMACY, DIT UNIVERSITY,
DEHRADUN, UTTARAKHAND -248001

Email: hrchitme@gmail.com

The complications during pregnancy and delivery are common and associated with mother or neonate or both. However, the extent of complications varies with respect to dietary condition, weather, lifestyle and medical facilities available in and around the place. Objectives: To perform a cross sectional study on the prevalence of gestational and neonatal complications in Dehradun. Method: Study was retrospective collection of data from medical records available in selected hospitals and nursing homes. Results: As per the data evaluated it was found that the mean age of women involved in the study was 32.34 ± 6.6 , BMI of mothers was 22.62 ± 1.695 , and APGAR score of newborns was computed to be 8.31 ± 0.461 . Pearson correlation analysis of data shows that there is very significant correlation between age of mother and marriage age, number of pregnancies with complication, BMI and APGAR score. Whereas, number of pregnancies with complications is very significantly correlated to age and BMI. This is to underline here that the first birth weight of neonate is negatively correlated to marriage age. APGAR score was also negatively correlated with age of mother. of common type of gestational complication was miscarriages, followed by caesarean delivery, anemia and hypertension. Conclusion: Gestational and

neonatal complications are prevalent in Dehradun and its surrounding cities needs an urgent attention to address the issue.

OB-13: Risk factor assessment and treatment strategies among the patients of varicose vein

PATEL S*, PATEL R, SHAH B, SHELAT B

RAMANBHAI PATEL COLLEGE OF PHARMACY,
CHAROTAR UNIVERSITY OF SCIENCE AND
TECHNOLOGY, ANAND, GUJARAT -388421,

Email: patelsandozrx@gmail.com

The present study was aimed to evaluate risk factors, prevalence, prescription pattern and effect of prescribed medicines among patients varicose vein. A prospective observational study was carried out at Mahagujarat Hospital. Data were collected from the date of admission till the 3 months follow up. Edinburgh Claudication Questionnaire and pain scale were used to assess pain and discomfort before and after the treatment. 66 patients were enrolled during the 6 months, irrespective of all age and gender. The prevalence of varicose vein was found in the age group of ≥ 60 years (27.2%). Male had higher prevalence of varicose vein as compared to the female gender i.e. 70% male and only 30% female. Prolonged standing (77%) is the most common cause of varicose vein in the present study. All the patients were advised of risk factors modification along with Diosmin in combination with Hesperidin, Calcium Dobesilate were given during perioperative and postoperative period. After the treatment, there was significant reduction of pain and discomfort from 4.9 to 0.07. It is concluded from the study that incidence of varicose vein increases with advancing

of age and less common in younger adults. Surgical intervention along with adherence to appropriate medical therapies and control of associated risk factors is essential to improve the quality of life and reduce the progression of disease.

OB-14: To study an influence of breathing exercise and inhalation techniques on patients quality of life of an asthma and COPD patients

BIRADAR SM1*, VINEETH KUMAR CHI, SAINADH K1, VINAY KUMAR NS1, AVINASH P1, AMBALI AP2, KALYANE NV1

BLDEA'S SSM COLLEGE OF PHARMACY & RESEARCH CENTRE VIJAYAPUR, ANDHRA PRADESH -586103

Email: smbiradar@rediffmail.com

In the present prospective and observational study, a total of 120 patients were enrolled, among 38 patients were diagnosed with Asthma and 82 were COPD patients. All the patients were trained with breathing exercise and inhalation techniques. The patients who have been prescribed with DPI and MDI inhalation devices were checked for their correct usage. The results indicate that there is a significant increase ($<0.001^{***}$) in correct usage after training session, which influences the inspiratory flow rate on Respirometer. Asthma Patient's Quality of Life were measured by using Checklist score before training was 2.9 and after training it was 8.1 ($<0.001^{***}$), ACT score before training was 9.3 and after training was 19.7 ($<0.001^{***}$) and AQLQ score before training was 35.6 and after training it was 74.1

($<0.001^{***}$). COPD Patient's Quality of Life were measure by using, Checklist score before training was 2.8 and after training it was 8.5 ($<0.001^{***}$), CAT score before training was 33.2 and after training was 12.1 ($<0.001^{***}$) and MMRC score before training was 3.6 and after training was 1.4 ($<0.001^{***}$). In the present study breathing exercises increases inhalation capacity and hands on training for inhalation techniques improves the efficacy of drugs, together influences the patient's Quality of Life (QOL) which reduces the number of days of hospitalization and socio-economic burden.

OB-15: A study assessing perception of generic medicines among interns and post graduate students in dental teaching institute

KAUR SUKHPREET*

DASMESH INSTITUTE OF RESEARCH AND DENTAL SCIENCES, FARIDKOT , PUNJAB - 151203

Email: drsukhpreetchd@gmail.com

The objective of this study was to explore the knowledge, attitude and practice of dental students towards the generic medicines. A cross-sectional study was carried out using questions from pretested and validated questionnaire which are applicable to Indian Scenario. A 22-item questionnaire were distributed to the participants to assess their knowledge, attitude and practice of generic medicine. All the Interns and MDS students were included in this study. The collected data was analyzed using Microsoft Excel. 63.4% participants agreed generics can be interchanged with a branded drug. 89.74% participants were aware

that bioequivalence studies are conducted by generic manufacturers for all the marketed generic medicines. Mostly participants (78.04%) were of opinion that generic medicines do not produces greater side effects than branded drugs. 54.05% participants reported that they were prescribing generic medicines. 52.38% participants were aware that generic medicine contains the same active substances as that innovator and used at same dose to treat same disease. In our study, we found that the prescribers had a considerable knowledge regarding the concept of generic medicines. However, to further increase the rate of generic medicine prescription training programs on generic medicines should be organized.

OB-16: A study of drug related problems among chronic kidney diseases patients in a tertiary care teaching hospital

ROY AD*, SHANFAR I, RAJ BKC.

NITTE GULABI SHETTY MEMORIAL INSTITUTE OF P'CEUTICAL SCIENCES, DERALAKATTE, MANGALURU

E-mail: aniladanielroy07@gmail.com

The current study was done to identify and characterize drug related problems among chronic kidney disease patients and to assess the scope of clinical pharmacist in addressing and managing the drug related problem. Prospective Observational Study A total of 200 CKD patients were enrolled for the study in which 66% were males and 34% were females. 2239 medication orders were reviewed and 723 DRPs were identified and then categorized based on PCNE classification V8.02 and the

rate of DRPs per patient was 3.61. The most common DRP category was (P2.1) adverse event (possibly) occurring (79.94%) followed by P1.3 untreated indication (11.61%) and the most frequent cause contributing to the occurrence of DRPs was found to be (C1.4) inappropriate combination of drugs (72.19%) followed by (C1.6) no drug treatment in spite of existing indication.(12.17%). Drug related problem pose a major challenge to the healthcare providers which results in significant morbidity and also decreases the quality of life of patients. Pharmacist can contribute in providing better clinical outcomes by implementing optimal pharmaceutical care.

OC-01: Synthesis and Evaluation of Biological Potential of Mangiferin Derivatives

TEMBHARE EKTA P*, PATIL M, KABRA U, GUPTA K, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: ektatembhare64@gmail.com

Aim of present study was to prepare amine and ester analogs and conjugates of xanthonoids especially, Mangiferin to obtain compounds with improve efficacy and selectivity as it have solubility problem, low intestinal absorption and rapid metabolism by glycosylation and the evaluation for their biological potential. The esterification of Mangiferin yields three compounds named as M1, M2 and M3. The percentage yield was upto 94-

96%. The synthesis of amine derivatives of Mangiferin by homologation procedure yields six compounds named M4, M5, M6, M7, M8 and M9. The percentage yield was upto 95-98%. The characterization of these synthesized compounds was takes place by TLC and solubility analysis. Further structural elucidation was carried out by spectral analysis techniques like UV, IR, NMR and Mass spectroscopy. All the compounds were evaluated for their antioxidant, antimicrobial and antiproliferative activity. The ester form and amine derivative of Mangiferin shows increase solubility and therapeutic activity. Almost all the synthesized derivatives have greater antioxidant, antimicrobial and antiproliferative activity than standard Mangiferin. All nine compounds have found to show notable antiproliferative activity on breast cancer cell line (MBD-MB-231) as compare to Standard Mangiferin. The results suggest that they are the excellent template for designing and further development of molecules that possesses antioxidant, antimicrobial and antiproliferative activity.

OC-02: A Study on Anticancer Potential of Bioactive Heterocycle Quinoline

SALVI LAVISH*, AHIR MAMTA, PRAJAPATI DEEPAK, MAHAWAR PAWAN, SHANKAR BHUMI, SARKAR AMRITO

KOTA COLLEGE OF PHARMACY , KOTA, RAJASTHAN-325003

Email: lavishgsalvi786@gmail.com

Quinoline nucleus plays an major role in anticancer drug development because their derivatives shows good results through various mechanism of action such as growth inhibitors by cell cycle arrest, apoptosis, angiogenesis inhibition, cell migration disruption, and modulation of nuclear receptor responsiveness. The anti-cancer potential of various quinoline derivatives have been tested on different cancer cell lines. This review specifically focus on the anticancer potential of quinoline derivatives, which could provide a great view of the quinoline derived compounds to a medicinal chemist for a comprehensive and target oriented information for development of clinically viable anticancer drugs.

OC-03: Synthetic Approach to Allyl Sulfides and its Biological Importance

GOYAL SALONI*, SHARMA PRATISHTHA

KOTA COLLEGE OF PHARMACY , KOTA, RAJASTHAN-325003

Email: salonigoyal4@gmail.com

In the present study different methods for the synthesis of allyl sulphides and their various biological activities were studied. The food-based natural products (allyl sulfides) are major organo-sulfur constituent of garlic had been studied due to their moderate toxicity accompanied by number of biological and therapeutic applications such as anti-cancer, anti-microbial, antibiotic, antimutagenic, detoxification, metal binding and catalytic

activity etc. It is more powerful inducer. The reason behind the remarkable biological application of allyl sulphides are their sensitivity towards the cellular component of living system. The broad-spectrum applications of allyl sulfides encourage us to do advance research on it. Sulfur present in allyl sulphide is termed as sulfane sulfur that is imputing to the extraordinary biological potential of allyl sulphide.

OC-04: Syntheses and antimicrobial evaluation of some novel 2,5-disubstituted 1,3,4-oxadiazole derivatives

VARSHNEY ROSHNI*, PANDEY SACHIN, FATIMA GUL NAZ, UPADHYAY SAVITA, SARAF SHAILENDRA K

FACULTY OF PHARMACY, BABU BANARASI DAS NORTHERN INDIAN INSTITUTE OF TECHNOLOGY, LUCKNOW. U.P- 226028,

Email: roshni.varshney011@gmail.com

Numerous evidences suggest that 1,3,4-Oxadiazole derivatives possess broad spectrum of biological activities. The object of this study was to synthesize novel 2,5-disubstituted 1,3, 4-Oxadiazole derivatives by oxidative-cyclization of aldehyde N-acylhydrazones through iodobenzene diacetate and screen for antimicrobial activity. All the derivatives were synthesized in four steps. In first step, 2-chloro phenylacetic acid ethyl ester was prepared by reacting 2-chloro phenylacetic acid with absolute ethanol and catalytic amount of H₂SO₄. In second step, the ethyl ester was reacted with hydrazine hydrate to form

2-chloro phenyl acetic acid hydrazide. In third step using various substituted aldehydes, N-acyl hydrazones were formed which finally were cyclized to form 1,3,4-oxadiazole derivatives using iodobenzene diacetate. All the derivatives were characterized by physical, chromatographic and spectroscopic methods and evaluated for their antimicrobial activity against gram-positive strains (*S. aureus*, *B. subtilis*), gram-negative strains (*E. coli*, *P. aeruginosa*) and fungal strains (*C. albicans*, *A. tubingensis*) by cup-plate method. Norfloxacin and Fluconazole were used as standards for antimicrobial activity, respectively. All the derivatives exhibited moderate to good activity. Among these, compounds CPF2, CPF5, CPF6 showed better potency at concentrations of 60, 40 and 60 µg/ml, respectively.

OC-05: 16β-Cyano-17β-hydroxy-4-phenylthia-4-androsten-3-one: A Potent Aromatase Inhibitor

SABALE PRAFULLA*

DEPARTMENT OF PHARMACEUTICAL SCIENCES RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR - 440033

E-mail: prafullasable@yahoo.com

Cancer is the second most important disease leading to death; approximately two-thirds of postmenopausal breast cancer patients have estrogen-dependent breast cancer. Aromatase is a cytochrome P450 dependent enzyme that catalyzes the aromatization of androgens to estrogens by three sequential

oxidation steps. Aromatase inhibitors can be classified as steroidal & nonsteroidal according to their mechanism of action. Inhibition of aromatase enzyme is an efficient approach for the prevention and treatment of breast cancer. Potent steroidal aromatase inhibitors are mainly C-2 and C-19 bridged steroidal compounds. The present study, planned to synthesize some novel steroidal derivatives with substituents at C-4 in ring-A and carbonitrile function in ring-D. Testosterone was converted into oxirane derivative, the oxirane epimers when treated with p-aminothiophenol in basic medium in tetrahydrofuran under inert atmosphere afforded the thioether. Androstenedione was converted into 16β-cyano-3β-hydroxy-4-androstene-3,17-dione which on Oppenauer oxidation afford 16β-cyano-4-androstene-3,17-dione. Further treated with alkaline H₂O₂ gave the oxirane, further stirred with thiophenol and sodium hydride in dry dioxane to gave 16β-carbonitrile. Synthesized compounds were evaluated for their aromatase inhibition in comparison with exemestane as the standard drug. It is evident that, 16-carbonitrile derivative is almost equipotent to the standard drug exemestane in inhibiting the enzyme.

OC-06: Chiral separation of oxomemazine enantiomers by HPLC technique and enantiomeric separation mechanism via docking studies

RAIKAR PRACHI*, GURUPADAYYA B M,
MANDAL SUBHANKAR P, MARUTHI R,
PRABHAKAR PRABITHA

JSS COLLEGE OF PHARMACY, JSS ACADEMY
OF HIGHER EDUCATION AND RESEARCH,
MYSURU, KARNATAKA, 570015

Email: prachipraikar@gmail.com

A normal phase- High Performance Liquid Chromatographic (HPLC) method was developed for the enantioseparation of Oxomemazine. Separation of enantiomers was attained on Amylose Tris (5-chloro-2-methylphenylcarbamate) using n-hexane: Iso-propyl Alcohol (IPA): Diethylamine (DEA) (60: 40: 0.1) as the mobile phase and the peaks were observed at 227nm using PDA detector. The run time of the analysis was set to 30 min. Linearity was found in the range 10-50 µg/mL. The enantiomers were separated at retention times 16.87 min and 21.37 min. The developed method was validated as per the ICH guidelines, thus proving the method to be selective, precise and showing linear response of Oxomemazine peak areas. Additionally, the method of chiral separation being understood by docking simulation study. The method was appropriate for analysis of Oxomemazine in the pure form and its formulation.

OC-07: Characterization of a novel BCL2 inhibitor as a cancer therapeutic agent

SHIVANGISHARMA*, VARSHAKK, VIDYA
GOPALAKRISHNAN, MANTELINGU K.,
SATHEES C. RAGHAVAN

INDIAN INSTITUTE OF SCIENCE, BANGALORE,
KARNATAKA - 560012

Email: sharmashivangi1992@gmail.com

The antiapoptotic protein BCL2 is overexpressed in several cancers, and contributes to prolonged cell survival and chemoresistance, lending itself an excellent target for chemotherapeutics. Recently we described the design and characterization of several small molecule inhibitors and among that some of them showed BCL2 specificity. METHODS Circular Dichroism, Biolayer Interferometry assays. Xenograft and allograft mouse tumor models. RESULT Disarib acts in a BCL2 specific manner as it shows selective cytotoxicity in a BCL2 high cancer cell lines and CLL patient primary cells, as compared to BCL2 low cell lines. Disarib induces tumor regression in several cancer tumor model via different ways without affecting the physiological functions. Further, we are exploring toxicological parameter in order to evaluate its potential to be developed as a clinically relevant small molecule inhibitor. Disarib has a potential to evolve as a clinically relevant drug, as it induces tumor regression without affecting the normal cellular functions. Further derivatization of Disarib is required for increasing its efficacy and evaluation of their therapeutic potential.

OC-08: Synthesis of Ornidazole tryptophan azo complex for colon targeting for treatment of Crohn's disease

RAJEEV KUMAR
SHARMA*1, N.V. SATHEESH MADHAVI, A.
K. SHARMA2

1DIT UNIVERSITY, FACULTY OF PHARMACY,
DEHRADUN, UTTARAKHAND-248009; 2 SBS
UNIVERSITY, BALAWALA - 248001

Email: Rajeev.sharma@dituniversity.edu.in

Crohn's disease is an inflammatory bowel disease (IBD). It causes inflammation of your digestive tract, which can lead to severe diarrhea, fatigue, abdominal pain, weight loss and malnutrition. Inflammation caused by Crohn's disease can involve different areas of the digestive tract in different people. Ornidazole is an antibiotic used to treat Crohn's disease. Our research work is focused on preparing Ornidazole tryptophan azo complex for colon targeting. Ornidazole tryptophan azo adduct was synthesized and the effect of enzyme azo reductase was examined on the release rate of Ornidazole and tryptophan in the gastrointestinal contents of rats. By using this approach Ornidazole can be targeted in the colon by using the carrier tryptophan so as to treat the Crohn's disease. The azo adduct did not release drug in acidic environment of stomach, but when the azo adduct will enter into colon the enzyme azo reductase break the azo bond and releases the dual drugs. By using this approach the drug is released in colon. The azo adduct was characterized by IR, NMR and mass spectral analysis. It was further subjected for evaluating its colon targeting property by in-vitro method using rat fecal matter. The cytotoxic and acute toxicity studies of the compound were also performed which reveals that the Ornidazole tryptophan azo complex

is safe for use in colon for the treatment of Crohn's disease.

Key Words: Crohn's disease, Ornidazole, Tryptophan

OC-09: Synthesis and Evaluation of Meropenem and Cefixime Metal ion Complexes for Antibacterial Activities

RAUT NEHA S*, GUPTA KRISHNA R, LOHIYA RAJESH T, UMEKAR MILIND J

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, MAHARASHTRA-441002 KAMPTEE,

Email: rautneha123@gmail.com

Aim of present study was to synthesis and evaluates the metal ion complexes with meropenem and cefixime for their antibacterial activity and minimum inhibitory concentration determination. The metal ion complexes of meropenem and cefixime with Cd (II), Ag (II), Pd(II), Zn(II), Ni(II), and Co(II) were synthesized and characterized by UV, FTIR, and NMR spectrophotometry. The antibacterial activities of the complexes were studied using disc diffusion method against some selected normal and resistant strains of bacteria. The minimum inhibitory concentration of the metal ion complexes were determined by broth dilution method. UV Spectroscopic studies suggested that meropenem ligand behaves for complexation with different metal ions and FTIR spectrum confirmed the proposed

structure. Similarly, UV spectrum of Cefixime metal ion complexes with λ_{max} 202-295nm was observed in all complexes, whereas IR peaks for a proposed structures were observed indicates the formation of complexes. Meropenem as well as cefixime metal ion complexes exhibited more antibacterial activity against all selected bacterial strains. Specifically, the lowest MIC of meropenem against *P. aeruginosa* and *K. pneumoniae* were observed to be 100 and 150ug/ml respectively. The synthesized metal ion complexes with meropenem and cefixime were confirmed and some complexes with Pd(II), Zn(II), and Cd (II) exhibited more antibacterial activity in comparison with meropenem and cefixime.

OD-01: Artificial Intelligence Based Computational Approach For Identification And Authentication Of Herbal Drugs

NAMAN SUBH*, BALDI ASHISH

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, BATHINDA - 151001

E-mail: subhnaman1794@gmail.com

An interactive platform was developed based on computer algorithms consisting of several images of each selected Indian spices that have potential to automatically recognize herbal drugs and their possible adulterants on plain as well as during the chaotic background.

For this reference database was created by imaging unique microscopical, morphological, physiochemical and analytical parameters of selected herbal drugs. Microscopical features like fibers, starch grains, calcium oxalate crystals, trichomes were some of the essential features extracted for the qualitative study. For bark identification, size and shape of the stone cells (ranging from 25-80µm), sclereids (50µm-120µm) etc. were some of the critical features employed for the identification of Indian spices. The AI based interactive platforms consisting of complex neural networks would eventually identify and authenticate drugs with outmost accuracy using recognition and retrieval tool from reference database. Based on above finding an android and iOS mobile app will be developed that had tremendous potential for helping the farmers in qualitative and quantitative growth of drugs. The developed app could be integrated to existing trading app of spices so that stakeholders involved in trading would gain possible advantages. The developed device would be capable to achieve state-of-art performance in authentication and e-trading of Indian spices.

OD-02: Formulation and evaluation of polyherbal extracts infused alginate coated gauze for wound healing

BHANDARKAR AV*, PARAB TU, JOSHI AB, GURAV SS

GOA COLLEGE OF PHARMACY, PANAJI -

403001

E-mail: anantpharm@gmail.com

The present study was carried out to formulate and evaluate wound dressing incorporated with poly herbal extracts into sodium alginate (AG)-coated gauze. The study involved effects of varying concentrations of AG on AG-coated gauze samples were carried out in terms of swelling ratio, moist environment and blood coagulation properties. Furthermore, measurement of drug release from the AG-MT gauze and antibacterial activity was also studied. Alginate wound dressings were formulated to replicate and improvise the formulation of the traditional healer. 0.5% w/v concentration of sodium alginate (Na-AG) with immersion time of 120 sec was considered ideal for the formulation of AG wound dressings. 0.25, 0.5 and 1% plant extract was loaded on AG coated gauze. Formulation F1 and F4 were found to be ideal and showed a drug release of more than 99 % in 24h. In antimicrobial screening, the formulation F6 showed significant zone of inhibitions compared to positive controls against gram negative bacteria: E. coli and S. typhi and fungi A. niger. In present study successful preparation of AG-coated gauzes with poly herbal extracts and antimicrobial evaluation been carried out.

Keywords: sodium alginate coated gauze, swelling ratio, moist environment, blood coagulation, drug release.

OD-03: Comparative Study of Antioxidant Potential of

Cow Urine with Selected Anticancer Medicinal Plants

MADAN SWATI*, RAJPUT SK

AMITY INSTITUTE OF PHARMACY, AMITY UNIVERSITY, NOIDA, UTTAR PRADESH- 201303

Email: swatimadan54@gmail.com

The current investigation is an attempt to explore the pharmacognostical, phytochemical and antioxidant activity of anticancer medicinal plant extract (Catharanthus roseus & Camptotheca acuminata). Cow urine contents are 95% water, 2.5% urea and 2.5% minerals, salts, hormones, and enzymes. The analysis revealed the phenolic and flavonoid containing extract to be the most active. Besides, fluorescence analysis and physicochemical evaluation were carried out according to the official guidelines and supported the quality control of the plant material. Preliminary phytochemical screenings of the extracts were also performed and confirmed the presence of various metabolites. Additionally, the, total phenolics and flavonoids were also determined spectrophotometrically. The antioxidant activity of the plant extracts and cow urine were performed by various methods including DPPH, ABTS radical scavenging assay, Ferric reducing antioxidant assay, Superoxide anion radical scavenging assay, Nitric oxide radical scavenging assay. Hence, the present study aids in screening out the potential activity of Cow urine as antioxidant, which provides a route to further for the isolation of lead bioactive compounds.

Keywords: Catharanthus roseus, Camptotheca

acuminata, antioxidant, phenolics, flavonoids

OD-04: Physicochemical Evaluation of Selected Ocimum Genus.

MICHAEL CHALES BRIGHTON*, SHARMA P

M M SCHOOL OF PHARMACY, MAHARISHI MARKANDESHWAR UNIVERSITY, SADOPUR, AMBALA, HARYANA-134007

Email: charlesmichael928@gmail.com

Drugs obtained from plants and their semi-synthetic derivatives have been recognized as the core pharmacologically active moiety for the diverse biological activities. The importance of the natural product based drug has generated interest to develop efficient extraction methods of these important classes of compounds to generate new therapeutic leads for various diseases. In this study we compared the extractive values, microscopic evaluation and preliminary phytochemical screening, Antimicrobial studies of the Ocimum Genus, The study will provide a platform to know the importance of the Ocimum Genus, widely known as Tulsi in the entire Indian population. The summarized information has focused that the extract of Ocimum canum was found to be the most active and produced highest zone of inhibition. Extract of Ocimum canum produced 98mm zone in e.coli, and extract of Ocimum Gratissimum produced 95mm zone of inhibition and extract of Ocimum sanctum produced 94mm zone of inhibition. In the future it gives hope for the microbial

treatment in a better way, which will greatly help the society. In the conclusion, Ocimum canum species among the different tested species contains more antimicrobial activity than others. Using this plant would be a great beneficial for the drug scientist to develop an efficient formulation of the crude drug, which will be a magical therapeutic agent, with the many advantageous.

Key Words: Ocimum Genus, Plant, Natural source, Tulsi, Drug discovery, Ayurveda, Eugenol

OD-05: Antidepressant and Anxiolytic Effects of Methanolic Extract from Bark of Madhuca Longifolia

PATEL VEENA SANDEEP*, JIVANI N, PATEL S

ANAND PHARMACY COLLEGE, OPP. TOWN HALL, ANAND, GUJARAT-388001

Email: veena.shingala@gmail.com

Different parts of Madhuca longifolia have been used traditionally for treating several ailments including mental disorders. The forced swim test (FST) and elevated plus-maze test (EPM) were used to evaluate antidepressant-like and anxiolytic-like activity of methanolic extract of bark of Madhuca longifolia (MEML) respectively. Spontaneous locomotor activity was measured using photoactometer. MEML administered at the doses of 100, 200 and 400 mg/kg, p.o. reduced immobility time in the FST exerting antidepressant-like activity.

In the EPM test, MEML at the same doses, produced anxiolytic-like effect; the doses active in both tests did not affect locomotor activity, indicating that these effects of MEML are specific. These potential antidepressant and anxiolytic-like effects of MEML require more detailed experimental study using animal models to approach a clear conclusion regarding the potential mechanism of the observed effect.

OD-06: Elemental Analysis of Pyrus Communis

KIRAN*, GARG VANDANA, DHIMAN ANJU

MD UNIVERSITY, ROHTAK – HARYANA - 124001

E-mail: kirankangra24@gmail.com

The aim of the present work to determine the amount of elements present in Pyrus communis

Elemental analysis of Pyrus communis was done by Wet digestion method.

Metal content like presence of Cu, Zn, Pb, Fe, Mg and Cd have been determined by atomic absorption spectrophotometer. P. communis contain metals in the permissible limits which suggest that pear is good for our health and provide nutrients to our body. The values of different metal present in the fruit samples (ppm) with their maximum possible limits. Based on our results, it can be concluded that P. communis contain minerals in the permissible limits which suggest that pear is good for our health and provide nutrients to our body.

Keywords: P. communis, atomic absorption spectrophotometer, Elemental analysis, Wet digestion

OD-07: Profile of an actinomycete exhibiting antifungal activity

SUBRAHMANYAM VM*,
ANANTHAMURTHY K,
CHANDRASHEKHAR HR

DEPARTMENT OF PHARMACEUTICAL BIOTECHNOLOGY, MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES, MANIPAL ACADEMY OF HIGHER EDUCATION [MAHE], MANIPAL - 576104

Email: vmsubrahman@gmail.com

To investigate the role in antifungal activity and characterize chitinase enzyme from an actinomycete (AFM-1) isolated from marine soil sample. The method employed Bioprospecting for actinomycetes using direct plating method (for liquid and solid samples), Screening for antifungal activity, Optimization of chitin concentration and growth temperature, Affinity purification of chitinase, Whole genome sequencing using Illumina MiSeq platform, Bioinformatic analysis of chitinase genes in AFM-1. An isolated actinomycete AFM-1 was found to be active against fungal pathogens. The isolate was identified as a Streptomyces based on 16SrRNA sequencing and other tests based on International Streptomyces Project (ISP) protocol. A simple affinity purification protocol was attempted and standardized for chitinase enzyme. The purified enzyme has an apparent molecular weight of 48kDa.

The AFM-1 genome was sequenced using Illumina MiSeq platform with 300x2 paired end chemistry (100x coverage). The annotated genome profile and its comparison with other actinomycetes (with special focus on chitinases and glucanases) are discussed. A set of simple methods for bioprospecting of actinomycetes and for the purification of chitinase were developed. Development of simple protein purification protocols and whole genome sequencing are a powerful combination of techniques that will in better utilization of potent enzymes from natural source.

OD-08: Cyclosporine A loaded nanoemulsions using bio-oils fractions

BHARGAVA SAMIR*, MADHAV SATHEESH NV

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, UTTARAKHAND - 248009

Email: samir.bhargava@dituniversity.edu.in

Nanoemulsions formulation is an upcoming approach to deliver peptides. The approach is used to reduce challenges during peptide delivery by many times. Nano emulsions contains drugs encapsulated or solubilized in an oily phase, with water as continuous phase. The nanoemulsions have been developed for encapsulating Cyclosporine A using fractions of Sesame oil. Pseudo ternary phase diagrams have been constructed using SigmaPlot 11, to identify the optimized area representing optimized concentration of Surfactant, oil and water. The comparison between oil

fraction and oil have been well proved by FT-IR. Nanoemulsions have been developed using solvent evaporation method. FT-IR of oil fraction also shows absence of Cyclosporine A fragments, indicating its encapsulation inside oil fraction. The FR Conclusions - The zeta potential of our selected formulation FSC 2 among FSC1-FSC6 has been found to be -15 mV, while its polydispersity is 0.225. The invitro studies clearly reveals First order release mechanism as best fit model for selected formulation. The r2 for selected formulation has been identified to be 0.99. The t80 of FSC2 has been found to be 3.5 Hrs. The TEM Studies of formulation reveal spherical appearance of particles with average particle size between 50 -220 nm. This has also been confirmed by particle size analysis.

OD-09: Regulatory role of HCMV miRNA's on Cellular Apoptosis

DR. GOSIPATALA SUNIL BABU*

DEPARTMENT OF BIOTECHNOLOGY, BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY, VIDYA VIHAR, RAE BARELI ROAD, LUCKNOW- 226025

E-mail: sunil_gos@yahoo.com

Human cytomegalovirus (HCMV), DNA (230-240 Kb) virus, belonging to β -Herpesviridae family, establishes lifelong latency upon primary infection. It exhibits ~100 % seroprevalence in lower socioeconomic environments of developing countries, including India. It causes significant morbidity and mortality in the immunocompromised and neonates. HCMV, has co-evolved with its human host, acquired myriad evasive strategies

for its survival and majority of its genome is dedicated for these mechanisms. One among such mechanism evaded by HCMV is apoptosis and its suppression increases the survival chance. Suppression of apoptosis by HCMV is attributed to its proteins, and the genomic region UL36-38, called as cell death suppression loci. By performing in silico studies, we identified antiapoptotic nature of HCMV miRNAs, and it gave the idea that there is another layer of regulation exerted on apoptosis by HCMV. Our results show hcmv miR UL 70-3p & UL 148D targets proapoptotic genes, MOAP1, ERN1 respectively. In vitro studies using HEK293T cells show that the miR UL 70-3p downregulate the H2O2 induced apoptosis. Further studies on the mRNA expression of MOAP1 levels show that miR UL-703p significantly downregulates mRNA expression. These results suggest that the miR UL 70-3p downregulates H2O2 induced apoptosis in HEK293T cells by targeting the MOAP1

Key words: Apoptosis, ERN1, Human cytomegalovirus, H2O2, MOAP1

OD-10: Astaxanthin- The King of Carotenoids

KUMARI JYOTI*, MISHRA SHUBHAM , SINGH SIDDHARTH, REHMAN FAISAL

FACULTY OF PHARMACY , DIT UNIVERSITY DEHRADUN-248009 UTTARAKHAND

Email: chaunhanjyoti3796@gmail.com

A pigment family called carotenoids found in crops, livestock, algae, and micro-organisms. In nature, 750 carotenoids were identified and 24 in the human body were found. There are two

kinds of carotenoids, Xanthophylls[oxygenated carotenoids] and Carotenes[carotenoids with hydrocarbons]. Examples of xanthophylls are astaxanthin, zeaxanthin, canthaxanthin, etc., whereas examples of carotenoids are beta-carotene. Astaxanthin is a reddish color pigment belonging to the class of xanthophyll carotenoids with unique characteristics and mechanism of action to support health and protect against cell harm owing to its powerful antioxidant activity and anti-inflammatory activity reported in human research and known as "carotenoid kings". It is ketocarotenoid, chemically known as 3, 3'-dihydroxy- β , β -carotene-4, 4'-dione, frequently found in marine sources such as *Haematococcus pluvialis*, *Chlorella zofingiensis*, and *Chlorococcum* sp., red yeast *Phaffia rhodozyma*, and marine bacteria *Agrobacterium aurantiacum*, salmon, shrimp, crab, and fish eggs, as well as some birds such as flamingos and quails. It is a lipophilic compound and demonstrates numerous health benefits in the human body such as cardiovascular disease prevention, boosting of the immune system, cataract prevention, bioactivity against *Helicobacter pylori*, protection against neurodegenerative diseases, improvement of skin health, cancer effects, improvement of eye health, reproductive health and related characteristics. It performs a number of roles such as avoiding lipid peroxidation, protecting against UV rays, harm to DNA, immune response, and oxidative damage to soft tissue current in the brain, eye, heart, and other human body sub-organisms. It is a strong coloring agent, a source of feed for poultry and aquatic cultivation. astaxanthin do not convert into vitamin A and has no pro-oxidant activity.

OE-01: A study of drug master file system in Australia, Canada, Japan, Saudi Arabia

BALAMURALIDHARA V, SRIDHAR S, T M PRAMOD KUMAR

**JSS COLLEGE OF PHARMACY,
SHIVARATHREESHWARA NAGAR, MYSURU ,
KARNATAKA - 570015**

Email: baligowda@jssuni.edu.in

The Drug Master File (DMF) is a technical document which is submitted by the API manufacturer or the DMF holder or the Authorized person appointed by the DMF holder to the regulatory authority to protect the confidential information. DMF contains the information about the manufacturing, intermediates, methods, impurities profiling, safety and efficacy information these data should be submitted. The mainly aim of study is to compare the requirements & Post approval changes procedures for the submission drug master file system in selected countries as per the country specific requirement data used for submission. The study concludes that the drug master file is filed in support of various applications to present drug into the market. But There is no regulatory requirement to file the drug master file in any country. The DMF filing may help the Manufacturer decreasing the approval timeline for drug product which includes the submitted DMF in the specific country where DMF is submitted.

OE-02: Using Storytelling and Digital Flash Cards

to teach complicated terminologies and names of chemicals used in Dental Materials: An Innovative Teaching and Learning Method.

**ARUL AMALAN^{1*}, YONG ZILING²,
TOO JUN HAN², YEOH KHER YING²,
AMIRTHAA ANBUANTHEN², SANUSHA
THIYAGARAJAN², THARANN
BALAKRISHNAN², SAFA NABIHA BINTI
SHAMSUL ARIFIN²**

**¹FACULTY OF DENTISTRY, MELAKA MANIPAL
MEDICAL COLLEGE**

**²FACULTY OF DENTISTRY, MELAKA MANIPAL
MEDICAL COLLEGE (MMMC), MAHE, MANIPAL,
KARNATAKA - 576104**

E-mail: arul.amalan@manipal.edu

To determine the effectiveness of storytelling and digital flashcards as a teaching method to help students to memorize complicated terminologies and chemical names used in Dental Materials. Dental students (n=69) in the 2nd year of the BDS program of Melaka Manipal Medical College (MMMC) were included in this study. Two sessions were conducted; on day one, storytelling session was held in which few stories were narrated, which included scientific terminologies and chemical names as characters. On day two, a PowerPoint flashcards containing scientific terminologies and chemical names was displayed and the students were asked to repeat the same multiple times. A closed ended questionnaire was used to assess their opinion as yes/no on motivation,



interaction, attraction, & ease of memorizing and this was assessed quantitatively. An open ended question was asked regarding their opinion about the study which was assessed qualitatively. Most of the students found the methods to be motivational (81%), interactive (88%), attractive (80%), and simple to learn (68%). Also, 51% stated this helped them to memorize complicated terminology. Positive comments such as good work, engaging, interactive, helped to remember, creative session and joyful session, were obtained from the study group. Based on the positive feedback, the use of storytelling and digital flash cards to understand tough topics was well received.

OE-03: Comparative analysis of compensation guidelines for clinical trial injuries in India and some countries leading in clinical research

JADHAV SWATI*, GHOOI RAVINDRA
SSBS, SYMBIOSIS INTERNATIONAL
UNIVERSITY, PUNE, MAHARASHTRA - 41211

Email: jadhavswatis@gmail.com

The clinical research guidelines worldwide are based on three basic ethical principles, respect, beneficence and justice, as given in the Belmont Report. Though these ethical principles remain same everywhere, the compensation guidelines of various countries are not similar. The 'New Drugs and Clinical Trial Rules, 2019' elaborate latest compensation policy in India. This study aims at analysis of rules and guidelines of compensation to clinical trial injuries in countries leading in clinical research. The methods we employed included desk and field research. In desk research, we collated and compared compensation rules of different countries- India, USA, Germany, France,

Japan and China. The field research included generating the data from opinions of different stakeholders of clinical research and analysing the output to understand the stakeholders' perspective. Result and We observed that compensation rules in our country were most elaborate and clear than other selected countries. The field research results brought to light the need for better training of clinical research professionals while telling us that satisfaction with Indian rules was low. Also, there is a need for rationalisation and uniformity of compensation rules worldwide. Though Indian rules are among the best, there is still a scope of improvement.

OE-04: Smart Impact of Machine Learning for future challenges of Drug Discovery

ASHISH KUKRETI*, SHWETA PALIWAL,
SIDDHARTH SINGH,

FACULTY OF PHARMACY, DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING,
DIT UNIVERSITY, DEHRADUN-
UTTRAKHAND-248009

E-mail address: akukreti73@gmail.com

Today the growth in the field of biological data has created a need to apply new novel learning methodologies. Introduction of new drugs has evolved overtime and moved from traditional approaches to computational and robotic approaches. Ensuring the safety of the drugs has been posed a major challenge in the drug discovery process. To counter back against the challenge machine learning has emerged as a changing technology. Machine learning is termed as an application of artificial intelligence providing the system with an ability to automatically learn from the experiences without being programmed

explicitly. The technological shift to machine learning in the pharmaceutical industry made the analysis of biomedical data. Machine learning has made it possible to identify the new drugs from a huge variety of chemical libraries with the help of computational algorithms. Machine learning techniques have been applied to the initial stages of drug development along with it prediction until the binder components are identified. We are on the way to identify several changes with machine learning as a glimpse of future in drug discovery and development

OE -05: DNA Sequence Prediction using Genetic Algorithms

PRAKASH KUMAR*, SIDDHARTH
SINGH, SHWETA PALIWAL

FACULTY OF PHARMACY, DEPARTMENT
OF CSE, DIT UNIVERSITY, DEHRADUN,
UTTRAKHAND- 248009

E-mail: prakashkr816@gmail.com

Change in DNA sequences does not occur randomly. Evolution refers to the accumulation of genetic alterations that originate from mutations and are transmitted through generations without being subjected to natural selection. To perform a change in the pattern of DNA sequencing, genetic algorithms came into existence. Genetic algorithm is an approach to solve constrained and unconstrained optimization problems based on natural selection, the process that drives biological evolution. Inspiration by evolutionary biology, Variation is introduced using two operators named as crossover and mutation. Today several genetic algorithms are associated with a well know – Human Genome Project that is an assembly of fragments of DNA sequences. Hence a combination of genetic algorithms and artificial neural networks are helping to predict new sequences for DNA.

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PA-01: Design and evaluation of fast dissolving tablet of bisoprolol fumarate by using natural and synthetic superdisintegrants

GUPTA PRIYANKA*, BISHT AMRITA, RAGHAVENDRA RAO NG

GRD(PG)IMT, RAJPUR ROAD, DEHRADUN, UTTRAKHAND-248009

Email: guptapriyanka1263@gmail.com

The main aim of present study Development and evaluation of fast dissolving tablet of Bisoprolol Fumarate by using different natural and synthetic superdisintegrants. Bisoprolol Fumarate is an anti-hypertensive drug which used for the management of the high blood pressure. The formulations were prepared by using Fenugreek mucilage, SSG, CCS, CP with different concentrations by direct compression method. The formulations were evaluated for pre-compressional and post-compressional parameters. FTIR analysis showed that there was no drug and polymers interaction. All the pre-compressional parameter values were within the limits. The hardness of the tablet was in range 3.1 ± 0.02 to 4.2 ± 0.02 (kg/cm²), friability of the tablet was in range 0.18 ± 0.11 to 0.28 ± 0.13 %. Thickness of tablet were in range 3.2 ± 0.11 to 3.5 ± 0.17 mm. wetting time was in range 67-90 sec, DT time was in range 22 - 180 sec. The percentage of drug content was found in range between 97.11 – 99.73 %. Formulation 16 showed the lowest disintegration time and in-vitro dissolution recorded and showed 99.36% drug release at the end of 20 min. From the study, it was concluded that natural superdisintegrant i.e fenugreek seed mucilage showed lowest disintegration time and 100% drug release within 20 min as compared to that of synthetic

superdisintegrants.

PA-02: Design and development of lafutidine gas powered system for controlled release

BISHT AMRITA*, GUPTA PRIYANKA, RAGHAVENDRA RAO NG

GRD(PG)IMT, 214, RAJPUR ROAD, DEHRADUN, UTTRAKHAND - 248009

Email: amritabisht618@gmail.com

The main aim of present study was to design and evaluation of the lafutidine GPS for controlled release and an attempt made to increase gastric residence time. Lafutidine is protective against experimental gastric lesions. Total sixteen formulations were prepared by direct compression method containing Lafutidine and various polymers like HPMC K4M, carbopol 940, fenugreek mucilage, sodium alginate. Citric acid, sodium bicarbonate used as gas generating agent to achieve buoyancy time. The results of both pre and post compression parameters were within limit of IP. FTIR studies conclude that, there was no incompatibility between drug with the excipients. All the physicochemical properties were evaluated for all formulation. Floating lag time was observed for all tablets which was less than 15 min and duration of floating tablet was greater than 24 hrs. Floating lag time was observed in formulations F4, F15 and F16 which shows 24, 23, 24 second respectively and duration of floating was nearly about 24 hrs and 99.9 % drug released. From the study, it was concluded that the formulation F4, F15 and F16 are most promising gas-powered controlled release tablets were floating lag time is very less and duration of floating was nearly about 24 hrs. Lafutidine can be developed to increase

gastric residence time and thereby increasing its bioavailability.

PA-03: Development and evaluation of unidirectional mucoadhesive bio-flexy films loaded with nanosized topiramate using a novel biopolymer from Glycine max

VARSHNEY S1*, MADHAV NVS2, SINGH SIDDHARTH2

1DOON VALLEY INSTITUTE OF PHARMACY AND MEDICINE, KARNAL; 2FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, UTTRAKHAND - 132001

Email: sugandhavarshney19.12.86@gmail.com

Formulation and evaluation of nanosized Topiramate loaded bio-flexy films using novel biopolymer isolated from Glycine max seeds for epilepsy treatment. Formulations containing nanosized Topiramate: Glycine max biopolymer (in ratios of 1:0.5, 1:1; 1:3, 1:5, 1:6, 1:10) (FGO1-FGO6) were prepared by solvent casting method. Glycine max biopolymer showed percentage yield: 81.06 ± 0.01 , light yellow, odourless, soluble in chloroform, water, colour changing point: $218^\circ\text{C} \pm 2$. Topiramate loaded bio-flexy films containing Glycine max biopolymer (FGO1-FGO6) revealed Thickness: $0.019 \text{ mm} \pm 0.012$ to $0.037 \text{ mm} \pm 0.010$, Surface pH: 7.01 ± 0.03 to 7.01 ± 0.02 , Ex-Vivo Mucoadhesion Time: 30-120 minutes, Ex-Vivo Mucoadhesion Time: 90-210 minutes, Weight Uniformity: 0.078 ± 0.05 to 0.083 ± 0.04 , Drug Content Uniformity: $72.7\% \pm 0.50$ to $82.84\% \pm 0.48$, Folding Endurance: 117-173, Swelling

Percentage: 62 ± 0.6 to 74 ± 0.4 , Percentage Moisture Uptake (PTU): 2.0 ± 0.13 to 2.8 ± 0.12 . The drug release pattern based on the T50% and T80% was found to be FGO2 (1:1) > FGO6 (1:10) > FGO1 (1:0.5) > FGO4 (1:5) > FGO5 (1:6) > FGO3 (1:3). Based on all evaluation parameters, FGO2 (containing Topiramate: Glycine max biopolymer (1:1)) Bio-flexy film having $R^2=0.9139$, Higuchi Matrix as best fit model, follows Fickian Diffusion (Higuchi Matrix) release mechanism, T50%: 25 hrs., T80%: 27 hrs. Prepared formulations were suitable for Soft Palatal Delivery.

PA-04: Formulation and evaluation of sustain release mucoadhesive microspheres of Cefodoxime proxitel

JORAPUR PN*, VINOD M PATIL CC, KALYANE NV

BLDEA'S SSM COLLEGE OF PHARMACY & RC, SOLAPUR ROAD, VIJAYAPUR - 586103

*Email: pnjorapur@gmail.com

The current aim of this work was to prepare and evaluate the gastroretentive mucoadhesive microspheres of Cefpodoxime proxetil. The microspheres were prepared by solvent evaporation method using polymers such as Eudragit RS100 & PMMA. The prepared microspheres were characterized for surface morphology, particle size analysis, DSC, FTIR swelling index, Drug Entrapment efficiency, and in-vitro drug release study. The prepared microspheres are smooth in surface & spherical in shape. The average particle size was in the range of 120-210 μm . The particle size and shape found to be dependent on the concentration of polymers. Drug entrapment efficiency of Cefpodoxime proxetil loaded microspheres found in the range of 76.13% to

84.62%. The drug release study was done in simulated gastrointestinal fluids (SGF) for 12 hour and shown maximum amount of drug release in the controlled and sustained manner to extended periods of time. The DSC analysis and X-ray diffraction study indicated that the drug uniformly dispersed in amorphous state in molecular level. The drug release kinetic followed non-Fickian transport.

PA-05: Formulation and evaluation of liquid solid compacts of lurasidone HCl

MARAPUR SHARANABASAPPA C.*

BLDEA'S SSM COLLEGE OF PHARMACY & RESEARCH CENTRE, VIJAYAPUR-586103

Email: cmsharanu@gmail.com

In the present study, an attempt was made to develop and evaluate the liquid solid tablets of Lurasidone HCl using carriers and covering substances like Microcrystalline Cellulose JP and Microcrystalline Cellulose JP reciprocally, using solvent like PEG 400 in different concentration. Direct compression method is used for preparation of liquid solid tablets. The developed granules were investigated for pre compression evaluation parameters like angle of repose, bulk density, tapped density, Carr's index, Hausner's ratio. The precompression evaluation suggested that all the granules are good flowing. The liquid solid tablets were investigated for post compression evaluation parameters like solidity, thickness, friability, drug content, weight variation, DSC, XRD, FTIR, Stability studies and in vitro drug release. All arranged liquid solid tablets were observed with their low SD values with good mechanical strength. FTIR and DSC showed compatible in drug and excipients. XRD was conducted to

know the nature of drug in the composition. Stability studies on all composition showed that, there are no considerable changes in drug content. Drug release from liquid solid tablets was determined by using USP dissolution analysis apparatus type II (paddle).

PA-06: Formulation and evaluation of matrix tablets containing chitosan based polyelectrolyte complex with natural gum for prolonged release of diltiazem HCl

RUDRAGOUDA G PATIL*

BLDEA'S SSM COLLEGE OF PHARMACY & RESEARCH CENTRE, VIJAYAPUR-586103

*Email: sonnapatil72@gmail.com

The aim of the present study was to formulate and evaluate the matrix tablets containing chitosan based polyelectrolyte complex microspheres of natural gum to for the better control of release of Diltiazem HCl (DTCL). Microspheres of DTCL were prepared using emulsion-crosslinking technique. The prepared microspheres were converted into matrix tablets by direct compression method and evaluated. Interaction of drug with polymers was examined by FT-IR spectroscopy, results indicated absence of chemical interactions between drug and the polymer. Differential Scanning Calorimetry studies indicated amorphous dispersion of Diltiazem HCl particles into the polymer matrix. The % encapsulation efficiencies were found between 36.5% and 84.8%. The average particle size of the prepared microspheres ranged from 9.3 to 16.87 μm when observed under optical microscope using stage micrometer. In-vitro

dissolution profiles of all formulations were carried in acidic buffer (pH 1.2) for initial two hours, followed by alkaline buffer (pH 7.4) for 12 h. The drug release was found to be dependent on %encapsulation efficiencies and the concentrations of chitosan and xanthan gum used. Further the pre-compression and post-compression parameters for the tablet blend and the compressed tablets were found to be well within the compendial limits and drug release study showed zero order release up to 12 hours.

PA-07: Formulation and in vitro evaluation of atorvastatin calcium containing microspheres by solvent evaporation method

VIBHU SAHANI*

TRANSLAM INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH, MEERUT, UTTAR PRADESH-250001

Email: vibhusahani@rediffmail.com

The aim of the present experiment was to prepare and evaluate spherical crystals of Atorvastatin calcium using methanol, water and chloroform and then microspheres were prepared by solvent evaporation method. The prepared spherical crystals were characterized for their micromeritic properties. The in vitro release studies were performed in 0.1 N HCl solutions (1.2 pH) for one hour. The prepared microspheres were characterized for their micromeritic properties and entrapment efficiency; as well by Fourier transform infrared spectroscopy, scanning electron microscopy revealed the crystalline nature of drug in a final stage. The in vitro release studies

were performed in 0.1 N HCl solutions (1.2 pH) for 2 hour followed by 6.8 pH phosphate buffer for 8 hour. The yield of preparation and entrapment efficiencies were very high with a larger particle size for all the formulation. Mean particle size, entrapment efficiency and production yield were highly influenced by the type of polymer and polymer concentration. It is concluded from the present research that Eudragitare promising controlled release carrier for atorvastatin calcium.

PA-08: Studies on solid dispersion adsorbate technique for improvement of content uniformity and dissolution profile of tadalafil

DHALL M*, LAMBA P

COLLEGE OF PHARMACY PT B D SHARMA PGIMS UNIVERSITY OF HEALTH SCIENCES ROHTAK- 124001, HARYANA

Email: dhall_manish123@yahoo.co.in

The aim of study was to enhance content uniformity and dissolution behavior of BCS class-II potent drug Tadalafil (TAD) through solid dispersion adsorbate (SDA) technique. TAD, a phosphodiesterase inhibitor (PDE5) utilized in management of erectile dysfunction, depicts dissolution rate limited absorption leading to its low bioavailability. Conventional solid dispersion (CSD) of TAD was prepared by fusion method. The ratios of carrier (PEG 6000) and adsorbent (Lactose) (1.5:8.5) were optimized on basis of powder flow properties. For preparation of SDA, PEG 6000 was melted in porcelain dish; TAD was dispersed in molten carrier and stirred. The molten mixture was incorporated drop-wise to lactose preheated

to 70°C with continuous stirring to obtain SDA of TAD. SDA was characterized by DSC, FTIR and XRD studies. DSC thermogram of SDA exhibited absence of endothermic peak at 306.72°C revealing presence of TAD at molecular level. FTIR spectra reported no chemical interaction between TAD and carrier. XRD diffractogram revealed absence of intense crystalline peaks of TAD implying its amorphous nature. Study illustrated good content uniformity of TAD (91.55%) in SDA. In vitro dissolution studies demonstrated augmentation in dissolution behavior of TAD in SDA (98.09% at 60 min) in contrast to pure TAD, marketed tablet and CSD. Studies divulge SDA is prospective technique for formulation of poorly soluble potent drugs into rapid release products.

PA-09: Formulation and evaluation of simvastatin injectable insitu gels for periodontal infections

KIRAN KUMAR Y*, PRAKASH KATAKAM,

SUBHASH C BOSE VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES, SURYAPET-508213, TELANGANA

Email: kiranypharma@gmail.com

Periodontal diseases are the conditions that affect the supporting structure of teeth leading to the formation of pocket due to which tooth loss occurs, for which site specific injectable drug delivery systems are gaining importance. In situ gels are made from polymers that exhibit phase transition due to physiological change in the environment. They can be easily delivered into the periodontal pocket with the help of syringe equipped with the needle appropriate for the intra pocket delivery. At pH 6.8, the

polymer changes its conformation to form into a gel. This delivery system has the ease of administration and has a long retention time because of the gel formation. In the present work, an attempt has been made to formulate in situ gel (sol-gel) containing atorvastatin as a drug using natural biodegradable polymer PCL. Three batches of simvastatin in situ Periodontal gels were prepared using natural biodegradable polymer (PCL) and tetrahydrofuran as a solvent in variable concentrations. The formulated gels were characterized for FTIR, surface pH, viscosity, syringeability, drug content, and in vitro drug release studies. The results revealed that the surface pH was within the range of neutral pH. The viscosity values were ranging from 323 to 372 dyne/cm². Best formulation in terms of percent drug release was formulation F3 with 99.53% drug release for 50 days. The optimized formulation could be employed for local controlled release delivery of Atorvastatin for bone regeneration in periodontal disease.

Keywords: Periodontal infections, Simvastatin, polycaprolactone, bone regeneration.

PA-10: Development and optimization of donepezil nanoparticles for brain delivery

PURI GR*, GARG Y, CHOPRA S, BHATIA A

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, DABWALI ROAD, BATHINDA, PUNJAB-151001, INDIA

Email: ipurirajgautam@gmail.com

Effective treatments of brain diseases or disorders require delivery of drugs directly

into the brain. Certain physicochemical properties of drugs like hydrophilicity and molecular weight possess great hurdle in the transport of drugs to brain as these properties tend to decrease the permeability of drug across endothelial membrane which separates systemic circulation and central interstitial fluid. Thus, an alternative route for drug administration needs to be explored which can overcome this barrier especially for patients suffering from diseases that requires chronic dosing. In this research work we have optimized and prepared donepezil hydrochloride loaded chitosan nanoparticles (NPs) for brain delivery via intranasal route. The optimized NPs has mean particle size of 177.8 nm, zeta potential of + 16.6 mV, drug payload of 22.2 mg/100 mg of chitosan with process yield of 91.96 % and mucoadhesive strength was found to be 9.26 g. The NPs were evaluated for in-vitro and ex-vivo diffusion and had shown promising results with > 90 % of release and > 70 % of drug permeation in 24 hours. Approximately 3 times more drug was quantified in rat brain with NPs vis-à-vis drug solution. Finally, confocal laser scanning microscopy confirmed the targeting and localization of NPs in the brain. The developed formulation was found to be stable at ambient room temperature for 3 months. Hence, it can be concluded that the developed NPs were able to target brain through nasal route.

PA-11: Characterization and evaluation of different variety of starch tablet formulation

DHINGRA D*, BHATIA A, SANDHU KS

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL

UNIVERSITY, DABWALI ROAD, BATHINDA, PUNJAB-151001, INDIA

Email: dhingradishant3@gmail.com

It is well known that starch is one of the abundant organic chemicals presents in tropical roots and tubers, grains, cereals, fruits. It is easily obtained from various botanical sources such as maize, potatoes, corn, wheat, etc. Starch is one of the most common excipients for tablets and other solid dosage forms. It is primarily used as binder as well as disintegrants in tablets. In present work, the tablet disintegrants potential of some native starch varieties obtained from different biological sources was studied. Physicochemical and disintegrants properties of isolated starch were measured and evaluate based up on the compendial specifications. All starches have satisfactory values of different parameters such as amylose content (< 28.66), solubility (< 25.38), swelling power (< 26.86), water absorption capacity (< 103.51). Furthermore, all tablets prepared with different starches has showed acceptable attributes e.g., hardness (> 4 kg), friability (< 1%) and disintegration time (< 15 mins). All prepared tablets qualified for the dissolution test for immediate release tablet (≥ 70% release in 45 min). Hence, it can be concluded that different starch varieties can be employed as economical and alternative pharmaceutical excipients.

PA-12: Development and validation of a uv spectrophotometric method of mycophenolate mofetil useful at preformulation stage of microemulsion formulation

KUMAR M*,MANDAL UK

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, DABWALI ROAD, BATHINDA, PUNJAB-151001, INDIA

Email: maddysharma3303@gmail.com

The main objective of this work was to develop and validate a simple UV spectrophotometric method to estimate mycophenolate mofetil required at preformulation stage for development of its microemulsion formulation. Absorption spectrum of the drug was recorded against methanol as a blank. Various analytical parameters such as linearity, limit of detection (LOD) and quantification (LOQ), accuracy, precision, stability, robustness were studied. The validated method was applied for solubility studies of the drug in various excipients to explore its microemulsion formulation. The developed method was found to be linear within the range of 5-35µg/ml. The LOD and LOQ values were found to be 0.796µg/ml and 2.412µg/ml, respectively. Other analytical parameters were within the range of ICH Q2 (R1) guidelines of analytical method validation. The developed UV method was successfully used to screen the solubility of few selected oils, surfactants and co-surfactants. The developed UV method of mycophenolate mofetil can be used successfully for solubility studies required for microemulsion formulation.

PA-13: Development and validation of UV-spectrophotometric method for estimation of losartan potassium in pharmaceutical dosage forms

DEVI A*, SAMBHYAL D, MANDAL KU

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, DABWALI ROAD, BATHINDA, PUNJAB-151001, INDIA

Email: arpnathakur405@gmail.com

The present research work deals with the development and validation of UV-spectrophotometric method for the estimation of losartan potassium in pharmaceutical dosage forms. The proposed method validation was carried out for accuracy, precision, linearity, limit of detection and quantification, stability, robustness as per ICH Q2 (R1) guidelines. Accuracy and precision were determined at three different levels i.e. 80, 100 and 120% of target concentration. The drug showed maximum absorption at 234 nm. The developed method was found to be linear over the concentration range of 1 to 20µg/ml. The co-efficient of correlation (R2) was found to be 0.985. The limit of detection and quantification were found to be 0.3µg/ml and .950µg/ml respectively. All the validation parameters were within the acceptance range of ICH guidelines Q2 (R1). The developed method was successfully applied to estimate drug content of a developed 100 mg losartan potassium tablet.

PA-14: Atenolol loaded self - double emulsifying drug delivery system for improved permeation and bioavailability

TANGUM*, SUBHNAMAN, BALDI A

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY

E-mail: duggertangum@gmail.com

Atenolol is a beta blocker medication primarily used to treat high blood pressure and heart associated chest pain. In present study, self-double emulsifying drug delivery system (SDEDDS) was applied to improve bioavailability of atenolol. It effectively avoids the poor stability of multiple emulsions during preparation and storage in vitro. For this, the primary w/o emulsion was prepared by one step emulsification technique. The optimization of concentration of oil and Span 80 for primary emulsion was done on the basis of average droplet size. Further concentration of secondary emulsifier was optimized and pseudo-ternary phase diagram was constructed. The prepared atenolol-SDEDDS were characterized for confocal scanning microscopy, viscosity, self-double emulsification performance and emulsion droplet size as critical quality attributes. In addition toxicity, ex-vivo uptake and transport studies were performed on Caco2 cell lines. The pseudo-ternary phase diagram showed double emulsion region. The viscosity was less than 10,000 cps at different shear rates. Uptake and transport studies revealed low intestinal membrane permeability of atenolol ($4.38 \pm 0.27 \times 10^{-4}$ cm/s) in comparison to atenolol+SDEDDS ($9.488 \pm 0.182 \times 10^{-4}$ cm/s) across Caco-2 cell line. The developed formulation may offer a better alternative with improved bioavailability.

PA-15: Optimization and Development of Novel Nail Lacquer of Itraconazole

CHOUDHARY D*, RITIKA, CHOPRA S, BHATIA A

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA

**RANJIT SINGH PANJAB TECHNICAL
UNIVERSITY, DABWALI ROAD, PUNJAB-151001**

E-mail: dikshachoudhary447@gmail.com

The present study was taken to develop the novel nail lacquer of itraconazole for the treatment of onychomycosis. UV spectrophotometric and HPLC method of analysis were developed for estimation of Itraconazole. Central composite design with 2 factors, each at 3 levels, was employed to optimize the composition of nail lacquer. Contour and response surface graphs were drawn and optimum formulation was selected. Lacquer was prepared using Eudragit RL 100 (film forming polymer), urea and salicylic acid (penetration enhancer). As evidence from 3D-response surface graphs, concentrations of polymers as well as penetration enhancer had predominant role on the drug permeation. Optimized Formulation was further evaluated the drying time, non-volatile content, water resistance, in vitro adhesion and morphology of nail lacquer was examine by SEM. Confocal laser scanning microscopy reveled the higher intensity of the fluorescence in the nail plate with developed lacquer vis-à-vis other tested formulations. Optimized formulation has shown better antifungal activity, against *Candida albicans*, in comparison to the control formulations. The developed formulation was found to be stable for three month stored at ambient room temperature. Thus, an efficient and stable nail lacquer was developed for potential transungual delivery of Itraconazole to target the drug to the nail bed and ensure efficiency against onychomycosis.

PA-16: Development and Evaluation of Solid Self Emulsifying Drug Delivery

System of Albendazole

NAHA A*, DHOOT A

**DEPARTMENT OF PHARMACEUTICS, MANIPAL
COLLEGE OF PHARMACEUTICAL SCIENCES,
MANIPAL ACADEMY OF HIGHER EDUCATION,
MANIPAL, KARNATAKA-576104, INDIA**

E-mail: anup.naha@manipal.edu

To develop Solid Self Emulsifying Drug Delivery System (S-SEDDS) for the improvement of solubility of poorly water soluble drug albendazole which has very less bioavailability of <5%. Methods: The Liquid SEDDS formulation was prepared using Peppermint oil as oil phase, Tween 80 as surfactant and PEG 600 as cosurfactant. The prepared SEDDS were subjected to various in vitro evaluations tests (self-emulsification property, globule size determination, zeta potential determination, robustness to dilution, thermodynamic stability studies). The optimized liquid SEDDS formulation was used for preparation of solid SEDDS following physical adsorbent technique using mixture of Avicel PH 101 and Aerosil 200 in ratio of 1:0.5 as inert solid adsorbent in 1:4 ratio of liquid SEDDS: Adsorbent. The prepared solid SEDDS were converted to free flowing granules by wet granulation methods using 1% PVP solution in isopropyl alcohol. Results: Liquid SEDDS showed good emulsification property with good globule size. Optimized solid SEDDS were evaluated for micromeretic properties and were showing good flow. In vitro dissolution studies showed significant increase in dissolution rate of drug when formulated as solid SEDDS. % CDR at 60 min as found to be 99.02 ± 0.7 % as compare to pure drug which was 27.39 ± 1.6 %. Conclusion: The results of our study concludes that the Avicel PH 101 can be used for the preparation of solid SEDDS to improve the solubility of Albendazole.

PA-17: Long Circulating Liposomes of Arteether for Sustained Release and Improved Bioavailability

TIWARI A*, MADHVI N, BALDI A

**DEPARTMENT OF PHARMACEUTICAL
SCIENCE AND TECHNOLOGY, MRSPTU,
BATHINDA-151001, PUNJAB**

E-mail: atiwari1795@gmail.com

Malaria is a serious endemic disease in many parts of the world. According to the World Health Organization (WHO), globally over 1.2 billion people are at high risk. The current failure to control malaria through effective vector control and treatment of the disease results mainly from an inability to deliver appropriate case-management to a significant proportion of patients, due to development of chloroquine resistance among patient. Biopharmaceutical limitations associated with arteether are its low solubility ($\sim 17 \mu\text{g/ml}$) and ≥ 40 % degradation in stomach, resulting in poor bioavailability. The aim of present study is to improve the bioavailability, preventing its degradation in stomach and for this arteether loaded liposomes were formulated by film method. Particle size and Polydispersity index (PDI) were determined by using Malvern Particle Analyzer, Zeta potential was determined using Malvern zetasizer and entrapment efficiency was found to be 47.1%. Release rate of arteether was found to be upto 50% in 14th hour and maximum release upto 80% in 18th hour showing sustained release pattern. The prepared formulation may be further explored for development of a sustained release formulation for arteether.

PA-18: A dermal delivery for aceclofenac liposomal formulation

SWARNA RAJ*, ABHIJEET OJHA, HARISH CHANDRA, DR. N.V SATHEESH MADHAV, BHAVNA

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, UTTARAKHAND-248009

E-mail: swarnaraj1112@gmail.com

Liposomes are simple microscopic vesicles in which an aqueous volume is entirely enclosed by a membrane composed of a lipid moiety and are well known to alter the bio distribution of entrapped substances by protecting the enclosed materials. Develop and evaluate NSAIDS loaded liposomes for dermal drug delivery from *Olea europaea* and *Sapindus mukorossi* and phosphatidylcholine were used as standard polymer for encapsulating the drug. Different formulation of both the polymers *Olea europaea* and *Sapindus mukorossi* and phosphatidylcholine were prepared with different drug polymer ratios by slight modification in the lipid hydration method and sonication method. The formulated liposomes were evaluated for different parameters like particle size, shape, drug content uniformity, entrapment efficacy, and in-vitro release study. The optimized formulation of dermal delivery for liposomal formulation composed of Aceclofenac show range of entrapment efficiency of different formulation of *Olea europaea* was 9.2-70.4% and for *Sapindus mukorossi* the range of efficiency was 13.3-72.4%. Entrapment efficacy for standard polymer phosphatidylcholine was 21.4-79.6%. The result indicated that formulated NSAIDS loaded liposomes could be utilized as a potential for dermal delivery system.

Keyword: liposomes, biopolymer, nabumetone, aceclofenac, *Olea europaea*, *Sapindus mukorossi*.

PA-19: Current Regulatory Status On Rules Of Medical Devices.

DR. VIKESH KUMAR SHUKLA*, SUHETA AMITY UNIVERSITY, SECTOR-125, NOIDA-201313, UTTAR PRADESH

E-mail: suhetatikoo@gmail.com

In last two decades there has been upsurge in the number and diversity of medical devices. In recent times, there are various advancements in the regulations of medical devices have been made. The regulatory paradigm for medical devices has changed since 1980s. Quality and safety of devices is dependent on the regulatory guidelines. Along with benefits of medical devices, if there are negative effects then it needs to be reported that is Adverse Drug Reaction (ADR). This ADR reporting system varies from country to country, which is reviewed. Therefore a law containing adequate guidelines of rules and regulations are required for monitoring the entry of such devices into the use in public health. Globally there is variation in regulatory aspects of medical devices. Each country have their own regulatory authority. The authorities are responsible for approval and supervision of medical devices. The present poster discuss about the classification of medical devices and regulations aspects in United States, European Union, Japan, India, Australia, Canada.

PA-20: Nutraceutical Regulation: Present Status And Future Prospective

DR. VIKESH KUMAR SHUKLA*, AKANKSHA RANI

AMITY UNIVERSITY, SECTOR-125, NOIDA-201313, UTTAR PRADESH

E-mail: akankshachaudhary054@gmail.com

Nutraceutical is a food or fortified food product that supposedly provide medicinal or health benefits including the prevention and treatment of disease. However, nutraceuticals have different legal definition according to different state laws. As nutraceutical blur the line between food and drugs, it is often difficult, by legal definition to distinguish between nutrients, food additives, drug and nutraceuticals. Most of the countries take a relaxed approach in regulation, unlike DSHEA (Dietary Supplement Health Education Act), the regulation of countries don't seem to provide adequate variation between food, drug, and nutraceutical. In recent years, especially in developed countries nutraceutical has boomed with its preventive and its health care advantages. In this present poster, studied about variation between the regulation of nutraceutical related to the Global aspects.

PA-21: Design and Evaluation Characterization of Bromocriptine Mesylate Effervescent Floating Tablets.

PRATIMA JAYASAWAL*, RAGHAVENDRA RAO NG, RAVALI M

GRD(PG)IMT, 214, RAJPUR ROAD, DEHRADUN, UTTARAKHAND- 248009

E-mail: priya1123prati@gmail.com

The aim of the present study was to develop effervescent floating formulation of

Bromocriptine mesylate to maintain constant therapeutic levels of the drug for over 10 hrs. Bromocriptine mesylate is a semi synthetic ergot alkaloid derivative with potent dopaminergic activity. All the formulations were prepared by direct compression method. In all the formulations, the results of pre-compressional parameters were within I.P prescribed limits. The physicochemical properties of different formulations, their buoyancy lag time and total floating time were evaluated. NaHCO_3 was employed as effervescent gas generating agent. It helps the formulation to float. Whereas from the dissolution studies it was evident that the formulation (F2) showed better showed buoyancy lag time 10sec and the tablet remained buoyant for 10hrs. The desired drug release pattern i.e., 98.56 % in 10 hours. It followed zero order release kinetics mechanism. From FTIR evaluation, we found no interaction between the drug and polymers used. The stability study conducted as per the ICH guidelines and the formulations were found to be stable. From this study, it can be concluded that, the formulation retained for longer periods of time in the stomach and provides controlled release of the drug. The results indicate that effervescent floating tablets of Bromocriptine mesylate containing HPMC K4M provides a better option for controlled release action and improved bio-availability.

*PA-22: Development of
Felodipine Solid dispersion
containing oral films for the
enhancement of solubility
and dissolution rate*

KUMAR LALIT*, SANA, SALWA.

**DEPARTMENT OF PHARMACEUTICS, MANIPAL
COLLEGE OF PHARMACEUTICAL SCIENCES,
MANIPAL.EDU, MANIPAL 576104, KARNATAKA**

E-mail: lk.kundlas@gmail.com

Aim of this study was to prepare and characterize felodipine solid dispersion containing oral films to improve its solubility and dissolution rate and reducing its hepatic first-pass metabolism. Methods: Felodipine solid dispersion was prepared using fusion method to enhance its solubility. Felodipine loaded solid dispersion was incorporated into oral films to avoid its hepatic first-pass metabolism. Prepared solid dispersions were characterized for FTIR, XRD, solubility and in vitro drug release studies. Formulated oral films were evaluated for drug content, in vitro drug diffusion, ex vivo permeation studies, etc. Results: FTIR results confirmed the absence of chemical interaction between drug and excipients. XRD inveterate the solid dispersion decreases the crystallinity of felodipine. Solubility and in vitro drug release studies evident the solubility enhancement of felodipine by preparing its solid dispersion. Drug content and folding endurance of formulated oral films was found to be $101.02 \pm 5.60\%$ and 400, respectively. SEM images revealed the presence of felodipine solid dispersion in oral films. In vitro drug diffusion displayed 97.38% felodipine diffusion in 90 min from formulated oral films. Conclusion: Obtained results conclude that the prepared felodipine solid dispersion containing oral films may be useful approach to enhance the oral bioavailability of felodipine by improving its solubility and dissolution rate and reducing its hepatic first-pass metabolism.

*PA-23: Co-Crystals:
Approach for Enhancement*

API Stability

**SHRAWAN KUMAR SONALI*, MISHRA
SHUBHAM, REHMAN FAISAL, SINGH
SIDDHARTH**

**FACULTY OF PHARMACY, DIT UNIVERSITY,
DEHRADUN, UTTARAKHAND-248009**

E-mail: Sonaliskumar97@gmail.com

An arrangement of Active Pharmaceutical Ingredient [API] and Co-former which present in the same crystal lattice in a stoichiometric ratio with the help of non-covalent interactions are called Pharmaceutical Co-crystals and the process by which it develops known as co-crystallization. They can be constructed via various types of interactions like hydrogen bonding, π - π interactions, ionic interactions, and van der Waals forces. They impart better improvement in essential features of APIs like bioavailability, solubility, physical and chemical stability, hygroscopicity, compressability and dissolution rate. Quinhydrone was the first co-crystal which discovered in 1:1 of benzoquinone and hydroquinone by Friedrich Wohler during the study of quinones in 1844. In 1922, Paul Pfeiffer classified co-crystals in his book "Organische Molekulverbindungen" into two parts, the ones manufactured from inorganic and organic components and the other ones only from organic components. On March.1.1937, the first patent was filed on the co-crystals of 2,4-dioxo-3,3-diethyl-tetrahydropyridin. The term "Co-crystal" was described by the Margaret C. Etter on January.11.1990. G. Radhakrishna Desiraju was the first who proposed "supramolecular synthon" concept in the crystal structure and also explaining his preference new term for 'co-crystal' to be known as "Multi-component system."

PA-24: Analytical Method Validation and Forced Degradation Studies of Elvitegravir: A Requisite for Drug Estimation In Lipid Architectonics

NABI B*; REHMAN S; BABOOTA S; ALI J

SPER, JAMIA HAMDARD, NEW DELHI - 110019

E-mail: nabibushra79@gmail.com

The objective of research undertaken is analytical method validation (HPLC method) of an anti-HIV drug Elvitegravir (EVG). Additionally carrying out the forced degradation studies of the drug under different stress conditions to determine its stability. It is envisaged in order to determine the suitable technique for the drug estimation which would be employed in further research. Lipid Architectonics (LA) of EVR was formulated using probe sonication technique and optimized using QbD (Box-Behnken design). For the estimation of drug during further analysis HPLC method has been validation on the parameters (Linearity, Precision, Accuracy, Robustness) and Limit of Detection (LOD) & Limit of quantification (LOQ) has been determined. Furthermore HPLC quantification of forced degradation studies was carried out under different stress conditions (acid induced, base induced, oxidative, photolytic and thermal). HPLC method was validated and in all the cases relative standard deviation (% RSD) was found to be less than 2%. The value of LOD and LOQ was found to be 40.8 ng/ml and 123.5 ng/ml respectively. The outcome from forced degradation studies demonstrated

that the drug was stable upon accelerated conditions in all the conditions and lied within the permissible limits (acceptance criteria is less than 20% as per FDA). Thus it concluded that that HPLC method selected was optimum for drug estimation and could be implemented during further research.

PA-25: Formulation by Design based Optimization of Solid Lipid Nanoparticles for Intensified Oral Bioavailability of Arteether

MADHAVI NUPUR*, BALDI ASHISH

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, DABWALI ROAD, BATHINDA

E-mail address: nupursingh1962@gmail.com

The purpose of present work is to enhance bioavailability of Arteether by developing solid lipid nanoparticle. In this work, solid lipid nano-particles (SLNs) containing arteether were developed by employing high speed homogenization method. Concept of Quality by Design and Formulation by Design was successfully employed during formulation of SLN. Fractional factorial design was employed for screening of factors that affect the quality profile of SLN. Face central composite design was deployed for optimization of screened significant factors. 2D contour plots and 3D response surface plots were drawn with the help of Design Expert software (Version 11) to define the relationship between the response variable (surfactant concentration and homogenizer

speed) and independent variable (entrapment efficiency and size). The developed SLNs was characterized for various parameters such as particle size (109.7±3 nm), particle charge, PDI (0.034), zeta potential (-4.53) and SEM. The maximum EE of optimized formulation was 47±1.9%. XRD of formulations showed amorphousness due to broad and diffused peaks. In vitro drug release pattern of optimized formulation showed that only 28% drug in first 5 h with maximum cumulative release of 77% in 13 h. In vitro results showed that release was slow and time dependant which helped to protect the acid degradation of ART in stomach. From the results, it can be concluded that ART-SLN offers a new approach to improve the oral bioavailability of ART.

PA-26: Adapalene Loaded Nano Sized Vesicles: An Effective Approach for Acne Treatment

ROHAN AGGARWAL*, MONIKA TARGHOTRA, P.K SAHOO, MEENAKSHI K. CHAUHAN

DEPARTMENT OF PHARMACEUTICS, DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH, NEW DELHI-110017

E-mail: rohanaggarwal30@gmail.com

The retinoid adapalene was formulated in a novel Invasomes as Penetration enhancer Vesicles (PEVs) as a topical drug delivery system for transport of the active pharmaceutical ingredient (API) into hair follicle orifices. Invasomes containing adapalene were prepared by mechanical dispersion method, penetration enhancer terpenes at different concentrations. All the invasomal formulations were evaluated for FTIR studies, entrapment efficiency,

stability studies and zeta potential analysis. Then the optimized invasomal formulation was used for formulating topical gel consisting of HPMC E-15. All the formulations were tested for physical properties, in vitro drug release and skin permeation studies. The size of invasomes was found to be uniform and spherical in shape. The entrapment efficiencies of all formulation were calculated. The IR spectral analysis suggested that there was no interaction between the drug and formulation excipients. The drug content was in the range of 82.98 ± 0.7 to 84.65 ± 0.5 %. The in vitro release data was calculated using franz diffusion cell. The percentage drug release of all the formulations was in the range of 44.78 ± 3.22 %, 52.45 ± 3.34 %. Formulations followed Higuchi's model for the release mechanism as the regression value is higher with zero order release kinetic for optimized formulation.

Keywords: Invasomes, Adapalene, Penetration enhancer, HPMC E-15, Vesicles

PA-27: Chitosan Niosomes for Controlled Delivery of Brimonidine Tartrate to the Ocular Membrane

MONIKA TARGHOTRA*, MEENAKSHI K. CHAUHAN

DEPARTMENT OF PHARMACEUTICS, DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH, NEW DELHI-110017, INDIA

E-mail address: monatarghotra@gmail.com

The aim of this study was to formulate Mucoadhesive Niosomes of Brimonidine Tartrate which may deliver the drug to targeted site more efficiently than conventional

Brimonidine Tartrate ophthalmic solution. Brimonidine Tartrate loaded niosomes were prepared by thin film hydration technique consisting of span 60 and cholesterol using rota evaporator and coated with chitosan (mucoadhesive). Coated Niosomes were evaluated for their size, shape and surface morphology, zeta potential, entrapment efficiency. The In-vitro drug release study and Ex-vivo corneal permeability studies were also carried out. Spherical and discrete vesicles upto 100 nm were observed by transmission electron microscopy. The maximum entrapment efficiency and zeta potential of optimized niosomes was 71.23 % and -9.82 mV, respectively whereas that of coated formulation was 80.36 % and 24.67 mV $\pm$ 4.66 respectively. The cumulative percent drug release from optimized niosomes and chitosan coated niosomes was 65.50 ± 2.63 and 70.90 ± 1.25 , respectively upto 24 hours which showed controlled and enhanced release from chitosan coated formulation. Ex-vivo studies were carried out using goat cornea which indicated that chitosan coated niosomes had better permeability as compared to both optimized and marketed niosomal formulation. As per result chitosan based formulation showed better permeability and long lasting action.

Keywords: Niosomes, Ocular delivery, Brimonidine Tartrate

PA-28: Navigation of Key Regulatory Information for Efficient Life-cycle Management of Regulated Product & Application in India

DR M P GOWRAV*, BALAMURALIDARA V, ABHISHEK B V

JSS COLLEGE OF PHARMACY, MYSURU

E-mail: gowrav@jssuni.edu.in

Initial a new drug (Chemicals) from the proof-of-concept stage to the advertising stage is an expensive and intricate process. It involves so many years of study and increase work. To save time and money in bringing products to market, product increase performance should be conducted in unity with the related regulatory requirements. These requests can inform development activities and help you to manufacture a product that meets the regulatory standards of your targeted influence that is, a quality product that is safe and effective for its proposed use. Even though information on the regulatory requirements (e.g., laws, supervision documents, worldwide standards for healthcare product development is eagerly available, navigating the regulatory system is not simple, and it gets even more difficult when dealing with multiple jurisdictions. To help entrepreneurs who are developing healthcare products. The main aim is to help the regulatory understanding that governs product development and certify regulatory observance. It can be used as a starting point to assist you in developing your product. Rather than helping as a compilation of regulations, the guide discusses the primary concepts and principles in regulatory affairs. It gives entrepreneurs a road map to follow.

PA-29: Chitosan coated Niosomes of Brimonidine Tartrate for Ocular delivery in Open angle glaucoma

JAYANTI MISHRA*, P.K. SAHOO,
MEENAKSHI K. CHAUHAN

DEPARTMENT OF PHARMACEUTICS, DELHI
INSTITUTE OF PHARMACEUTICAL SCIENCES
AND RESEARCH, NEW DELHI-110017

E-mail: jayanti.dipsar@gmail.com

Present study involves development of Brimonidine Tartarate (BT) loaded chitosan niosomes for ocular delivery to prolong the drug's residence time. BT is a water soluble drug with a systemic half-life of approximately 2.5 hours having neuroprotective effect so used in the treatment of open-glaucoma that requires frequent dosage administration. Hence, the main objective of the present work to develop BT niosomes, which would improve its bioavailability and reduce dosage frequency. BT loaded chitosan niosomes were prepared by film hydration method. Niosomes were evaluated for size, shape, zeta potential, entrapment efficiency (EE). In-vitro and Ex-vivo studies were also performed. Spherical and discrete vesicles upto 100 nm were observed by transmission electron microscopy. The maximum entrapment efficiency and zeta potential of coated formulation was 80.36 % and 24.67 mV $\pm$ 4.66 respectively that shows stability of formulation. The cumulative percent drug release from chitosan coated niosome was found to be 70.90% $\pm$ 1.25 upto 24 hours. Ex-vivo studies using goat cornea indicated that chitosan coated niosomes had better permeability as compared to both optimized and marketed niosomal formulation. The results obtained suggested that Chitosan Niosomes of BT can be successfully designed in future to deliver the drug for prolong period of time.

PA-30: Development of Pullulan Based Nanomicelles

for Targeting Gliptins

SHARMA DEEPIKA*, KUMARI BHAVNA

FACULTY OF PHARMACY, DIT UNIVERSITY,
DEHRADUN, UTTARAKHAND-248009

E-mail: ocimum05@gmail.com

In this work we propose to use a natural polymer (pullulan) for the production of nanomicelles. The prepared nanomicelles were characterized for particle size, zeta potential, surface morphology, loading and release efficiency, and In vitro release. In the current research, sitagliptin loaded polymeric nanomicelles were prepared in various trials using direct dissolution method. In this method, best optimized formula was F-3 with a concentration of 10 mg polymer that was dissolved in 15 ml of distilled water (DW) and 0.5 ml surfactant was added. 6 mg drug was added to the polymer solution and sonicated for 20 min. Optimized nanomicelles had spherical shapes with a mean diameter of 755.9nm and a zeta potential of -6.87 mV. In PBS pH 7.4, pullulan-based nanomicelles were found to have an initial burst release of 30% of the drug, which maintained up to 24h. Sterilized optimized formulation passes the test for sterility for anaerobic microorganism, and there was no growth, which indicates its safety. Pullulan, a nonionic polysaccharide has special properties like nontoxicity, non-immunogenicity, non-carcinogenicity, biodegradability and high water solubility. Thus pullulan as carrier demonstrated to hold potential for the production of nanomicelles with an application in drug delivery systems.

PA-31: Genistein-Loaded Nanostructured Lipid Carriers For Intravenous

Administration: A Quality By Design Based Approach

DUA ROHAN*, MITTAL POOJA

MM SCHOOL OF PHARMACY, MMU, SADOPUR,
AMBALA, HARYANA - 134007

E-mail: rohandua04@gmail.com

Genistein (Gen) is supposed to be a naturally occurring soy isoflavonoid, which is having antiproliferation, antioxidant & anticancer-like properties. By which, it act as a anticancer agent. Some disadvantages like poor solubility and less oral bioavailability restrict its use as potential anticancer agent. By the present study, Gen was setup into solid-liquid lipid mixture with the aid of surfactant by using modified solvent evaporation technique. The work was carried out with the aim to screen the component and process variables which ease the formulation process. The complete process formulated the NLC formulation which resulted in best results with respect of particle size, PDI, zeta potential & entrapment efficiency. Optimized levels by employing numerical optimization technique for each factor viz. Lipid concentration (X1), surfactant concentration (X2) & organic solvent amount (X3) were 0.78 %, 0.3 % & 8.51 ml respectively. With the completion, the formulation exhibited a particle size of 122.22 nm, entrapment efficiency of 92.8 %, & zeta potential of -21.25 mV with unimodal size distribution. With the study of haemocompatibility, the optimized formulation was found to be pretty safe for intravenous administration. For the formulation industry, the resultant GenNLC's can be a superior alternative carrier system to obtain the higher entrapment with excellent stability of the formulation.

Keywords: Nanostructure lipid carriers,

optimization, Haemocompatibility

PA-32: Potential Of potential of Nanoparticles As Drug Carriers

SAXENA J*, TANGRI P, TANGRI S, RAGHVENDRA N.G

GRD (PG) IMT, DEHRADUN, UTTARAKHAND-248009

E-mail: jjyotisaxena6july1996@gmail.com

There is great interest in developing new nanodelivery systems for drugs that are already on the market, especially cancer therapeutics. Ideally, nanodelivery systems will allow for more specific targeting of the drug, thereby improving efficacy and minimizing side effects. By using nanotechnology in drug design and delivery, researchers are trying to push nanomedicine to be able to deliver the drug to the targeted tissue, release the drug at a controlled rate, be a biodegradable drug delivery system, and to be able to escape from degradation processes of the body. The prefix 'nano' derives from Greek word for 'dwarf'. Nanoparticles can range in size from 1 to 100 nm. One nanometer (nm) is equal to one billionth of a meter (1 nm = 10⁻⁹ m). This progressive continuous influx of novel technology platforms lead the potential to a positively healthcare impact at various important levels like detection of molecular changes responsible for disease pathogenesis, imaging and diagnosis of various diseases, drug delivery, multifunctional systems for combined therapeutic and diagnostic applications, vehicles to report the in vivo efficacy of a therapeutic agent and nanoscale enabling technologies which will accelerate scientific discovery and basic research.

PA-33: Phytochemical Analysis of Terminalia catappa Fruit In Ethanolic Extract Using Gc-MS

KUMAR ADITYA*, SAHARAN ANJALI, GAUTAM RUPESH

MM SCHOOL OF PHARMACY, MMU SADOPUR-AMBALA, HARYANA - 134007

E-mail: adityadon321@gmail.com

The present research was performed using gas chromatography-mass spectroscopy (GC-MS) to explore about the various phytoconstituents present in the ethanolic extract of Terminalia catappa. This study helps in isolation of characters of phytoconstituents on basis of their pharmacological potential. From the study it was concluded that 65 different phytoconstituents were found in the ethanolic extract of the whole fruit part of Terminalia catappa using GC-MS, among which all possess pharmacological potential. GC-MS has been performed for the isolation of different active phytoconstituents and pesticidal residue determination found in the authenticated sample of Terminalia catappa. Concentration of pesticides should be in permissible ranges for human consumptions of herbal drugs as they would result in severe effects on the food chain or bioaccumulation that lead to chronic outcomes. Medicinal properties of T. catappa have been recognized for its essential phytoconstituents such as phenol, flavonoid and carotenoid. Presence of these components depicts plant's capability to act as antimicrobial, anti inflammatory, antidiabetic, antioxidant, hepatoprotective, and anticancer activities. From the above it was revealed that plant does not contains

any pesticidal residues and can be progressed for further production of natural medicinal formulations in pharmaceutical sector with great therapeutic ease.

PA-34: Formulation and characterization of Genistein-loaded nanostructured lipid carriers

PRASAD GANGESHWAR*, MITTAL POOJA

MM SCHOOL OF PHARMACY, MMU SADOPUR-AMBALA, HARYANA- 134007

E-mail: gangeshwarprasad2016@gmail.com

Genistein (Gen) is a naturally occurring soy isoflavonoid, possessing anticancer, antiproliferation & antioxidant properties. The disadvantage of poor solubility and less oral bioavailability restrict its use as potential anticancer agent. The current work is focused on the formulation and characterization of the Genistein loaded nanostructured lipid carriers that can entrap enough quantity of the drug which will provide sustained release of the drug for the treatment of ovarian cancer. The nanostructure lipid carriers of Genistein were developed with the aid of solvent emulsification and evaporation technique by employing TPGS as surfactant. The resultant formulation was characterized for various physicochemical properties. The resultant formulation exhibited a particle size of 130.23 nm, and entrapment efficiency of 94.27 %, & zeta potential of -20.21 mV with equal size distribution. In a nutshell, Gen NLC seems to be a superior alternative carrier system for the formulation industry to obtain the higher entrapment with excellent stability of the formulation.



PA-35: Extended Release of Brimonidine From Commercial Hydrogel Contact Lens For Glaucoma

NAVNEET KUMAR*, MEENAKSHI K. CHAUHAN

DEPARTMENT OF PHARMACEUTICS, DELHI INSTITUTE OF PHARMACEUTICAL SCIENCE AND RESEARCH, NEW DELHI, INDIA

E-mail: rcpharma74@gmail.com

The Bioavailability of therapeutic agents from eye drops is usually limited due to various corneal barriers. Frequent administration of eye drops leads to in compliance in patients with glaucoma, so there is a great need for medical device such as Hydrogel contact lens to treat glaucoma. The objective of the present study was to provide sustained ocular delivery of brimonidine via hydrogel contact lens by incorporating vitamin E diffusion barriers which may improve bioavailability by increasing ocular residence time of drug. The present work was to encapsulate drug in niosome and to entrap these niosomes in the hydrogel. Niosome was prepared by thin film hydration method using different molar ratio of Span 60 and cholesterol. The niosomes were characterized by particle size, surface morphology, Zeta potential, Entrapment efficiency and In-vitro drug release. Spherical and Discrete vesicles of <250 nm were observed by transmission electron microscopy. The maximum entrapment of niosomes was $85.55 \pm 0.49\%$. Zeta potential of optimized formulation was obtained as -54.62 mV. In vitro study showed that brimonidine niosomes shows more sustained release of drug as compared to brimonidine solution. The

hydrogel was characterized by studying their optical and physical properties to determine their suitability as extended wear contact lenses. This study demonstrates the promising potential of drug loading into contact lens to serve as a good platform for sustained ocular drug delivery.

PA-36: Formulation, optimization and in vitro evaluation of PLGA nanoparticles containing Paclitaxel

ZAFFAR MARGHOOB*, MITTAL POOJA

MM SCHOOL OF PHARMACY, MMU, SADOPUR, AMBALA, HARYANA-134007

E-mail: marghoobzaffar931@gmail.com

Paclitaxel (PTX), is a naturally occurring diterpenoid which comes under first-line anticancerous drug and also has some disadvantage of poor water solubility and nonspecific biodistribution that causes serious side effects to the human body. PTX is available in the market which contains Cremophore EL as one of the components, this component causes serious allergic reactions to the subject. These defects of the existing formulations need some alternative non-allergic nanoformulation for intravenous use. PTX loaded Polymer (PLGA) based nanoformulation was developed with the objective of formulating Cremophore EL free nanoformulation intended for intravenous use. PTX loaded nanoparticles were prepared by the nanoprecipitation method. The small nanoparticles (143.2 nm) with high entrapment efficiency (95.34%) and uniform size throughout (PDI-0.115) and were obtained by the employing Box Behnken design for the optimization of the

formulation with the aid of suitable approach based on numerical optimization technique. The completed optimized levels for each factor viz. surfactant concentration (X1), polymer concentration (X2), amount of organic solvent (X3) were 1.13%, 0.23 %, & 5ml % respectively. The formulation of In vitro release data confirmed the sustained release provided by the formulation. In a nutshell, the polymer-based alternative formulation of Paclitaxel was prepared successfully.

Keywords: Paclitaxel, Box-Behnken design, Optimization, Nanoparticles

PA-37: Formulation and Characterization of Buccoadhesive Tablets of an Antipsychotic Drug

PANDE S, BHAGARIYA D*, SOLANKI A., PATEL V.

A. R. COLLEGE OF PHARMACY AND G. H. PATEL INSTITUTE OF PHARMACY, VV, ANAND, GUJARAT

E-mail: saikatpande@gmail.com

Though peroral route drug administration have wide acceptance, however it has numerous disadvantages such as first pass metabolism, enzymatic degradation within the GI tract etc. Buccal delivery of drug emerged as an alternative to the oral route of drug administration, and is a subject of growing interest. Quetiapine Fumarate (QF) is a second-generation ('atypical') antipsychotic agent used in the treatment of schizophrenia and bipolar mania. QF is BCS Class II drug with very low oral bioavailability (9%), reason being its limited absorption due to poor aqueous solubility and extensive hepatic metabolism.

Thus, the objective of the study was to enhance solubility of QF followed by its formulation into buccoadhesive tablet. Quetiapine Fumarate- β -Cyclodextrin (QF-BCD) complex was prepared by kneading method in an effort to enhance solubility of Quetiapine Fumarate. Solubility study indicates that there was a significant increase in solubility of QF in QF-BCD complex. Comparative evaluation of XRD profile of pure QF and QF-BCD complex confirm reduction of crystallinity of QF. Buccoadhesive tablet of QF-BCD complex was prepared using different bioadhesive polymers such as Carbopol 934P, HPMC K4M, sodium alginate, individually and in combination. From the results of study for mucoadhesive strength and drug release studies, formulation consisting of combination of Carbo934P and HPMC-K4M emerged as best formulation among all prepared batches of buccoadhesive tablets.

PA-38: Development of Protransfersomal Gel containing Alendronate - A Nitrogen Containing Bisphosphonate for Transdermal Route

PRAKASH UDAI*, KUMAR ASHISH, GUPTA PARAS, CHAUHAN K MEENAKSHI

DEPARTMENT OF PHARMACEUTICS, DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH, NEW DELHI-110017

Email: udaiprakash8@gmail.com

Osteoporosis is most common metabolic disorder these days that require chronic clinical observations and constant adherence to

medication. Alendronate - a nitrogen containing bisphosphonate used for postmenopausal women. Along with low oral bioavailability, it also causes mucosal damage, ulcers and erosive gastritis. Therefore, to improve its compliance and bioavailability we had developed a new transdermal system for alendronate using provesicular system. Electropositivity of alendronate helps it to formulate in a vesicular system. Protransfersomal (Pro-T) or provesicular systems were prepared by phase separation coacervation method which has been further optimized by Box Behnken Design. Pro-T-gel formed was found to be liquid crystalline in nature, elastic, high degree of elasticity and fluidity. Optimized formulation showed particle size ($284 \pm 1 \text{ nm}$), encapsulation efficiency (67.12%), zeta potential (-26.4 mV), drug loading (72.3%) and spontaneity (13.15) which is optimum for transdermal delivery of drugs. Ex-vivo permeation study on rat skin showed 12.34 times enhanced permeation when compared with drug suspension. Formulation was found to be stable under refrigerated condition ($4 \pm 1^\circ \text{C}$). These findings indicate that our transdermal delivery system of alendronate is a promising approach that results in improved bioavailability, therapeutic efficiency and better patient compliance undergoing treatment for osteoporosis.

Keywords: Osteoporosis, Protransfersomal, Alendronate

PA-39: Formulation and Evaluation of Liposomal Gel for Transdermal Delivery

ZODE RASHMI D*, LADE M, TRIVEDI R, RAUT N, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE,

MAHARASHTRA-441002

Email: rashmizode@gmail.com

Aim of present study was to formulate and evaluate a liposomal gel for transdermal delivery for the treatment of Parkinson's disease using Pramipexole drug to enhance biological half life and prolonged drug delivery. The liposomes of pramipexole were prepared by the thin hydration method using different natural and/or synthetic phospholipids and cholesterol for transdermal application to the study of the viability of skin drug deposition for drug delivery in parkinson's treatment. The prepared liposomal gel was evaluated by pH, spreadability, % drug content and in vitro drug release from the different ratio of phospholipid and cholesterol. In this study 12 formulations (F1-F12) were taken which were divided into different groups depending on their different synthetic and/or natural phospholipids: pramipexole: cholesterol ratios. The pH and spreadability of gel was seen in the range of 6.037 to 6.84 and 2.835 g/cm/sec to 12.21 g/cm/sec respectively. The drug content was determined for all formulation (F1-F12) in the range of 90.49% to 99.90%. The % release of pramipexole liposomal gel composed of cholesterol concentration of F1(G), F2(G) and F3(G) was 15.39%, 26.67% and 35.30% respectively. The % release of F1(G), F2(G) and F3(G) was $76.33 \pm 0.5127\%$, $73.17 \pm 0.2360\%$ and $70.94 \pm 0.4096\%$ respectively. The result of in vitro skin permeation study pramipexole from the gel formulation clearly shows that the gels have ability to retain the drug for prolonged periods.

PA-40: Green Synthesis of Curcumin Nanoparticles

RAMTEKE ASHVINI C*, MANKAR A,

RAUT N, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTEE,
MAHARASHTRA-441002

Email: theashvinicr@gmail.com

The aim of present study was to prepare and evaluate the green synthesized Curcumin Nanoparticles and its antibacterial activity. The synthesis process was carried out through a simple green methodology. Synthesized nanoparticles have been characterized by UV-spectroscopy, organoleptic properties, melting point, boiling point, pH, particle size determination and solubility. Synthesized nanoparticles were analyzed for antibacterial activity by using MIC determined by broth dilution method or solid dilution method against *Escherichia coli* and *Staphylococcus aureus*. Zn- Curcumin Nanoparticles UV-Spectrum has shown slight shifting at λ_{max} 327nm in Distilled Water and λ_{max} 343nm in Methanol. Zn-Curcumin Nanoparticles and Pd-Curcumin Nanoparticles were insoluble at neutral pH. The synthesized Zn-Curcumin Nanoparticles gives neutral pH, while the synthesized Pd-Curcumin Nanoparticles gives acidic pH. The particle size of Zn- Curcumin Nanoparticles was found to be in the range of 141.8-164.2 nm. Zn-Curcumin Nanoparticles gives potent result against *S. aureus* and *E. coli* bacteria in the comparison with Pd-Curcumin Nanoparticles. In the present study, synthesized and developed an eco-friendly and efficient Zn-Curcumin Nanoparticles and Pd-Curcumin Nanoparticles with Curcumin. The synthesized Zn-Curcumin Nanoparticles has shown potent antibacterial activity against *Escherichia coli* and *Staphylococcus aureus* bacteria in comparison with plane curcumin.

PA-41: Formulation and

Evaluation of Herbal Gel for Anti-Arthritic Activity

YADAV SAKSHI RAMESHWAR*, UL
HAQUE R, BIYANI D, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTEE,
MAHARASHTRA-441002

Email: sakshiyadavjmd12@gmail.com

The aim of present investigation was to evaluate anti-rheumatic activity of two herbs (*Commiphora mukul* and *Boswellia serrata*) and to formulate a topical gel dosage form. *Boswellia serrata* dry extract 65% was collected from the Konark Herbs and Health Care and *Commiphora mukul* dry resin was collected from Local Market, Nagpur. The evaluation of crude drug and the re-successive solvent extraction of resin was carried out. From the result of preliminary phytochemical screening of extract, it was observed that the fractional product of *Commiphora mukul* resin contained triterpenoids and sterols. The result obtained from present work indicated that the entire drug was uniformly distributed and there was no precipitation in formulation. It was observed that the formulation was stable at different temperatures and exhibit good percentage spread by weight that would assure the skin application. From the present work, it was concluded that it is possible to formulate the herbal gel for anti-arthritic activity by using *Commiphora mukul* and *Boswellia serrata*. The results showed that the content of Gel components had significant effect on their physical, rheological and in vitro drug release characterization. Keywords: Rheumatoid arthritis, *commiphora mukul*, *boswellia serrata*, carbopol 934, herbal gel, steroids, resins, joint pain

PA-42: Studies on Liquisolid System as a Technique to Enhance the Dissolution Rate of Ritonavir

PRABHUDESAI ADITI PRABHAKAR*,
AGARKAR D, BIYANI D, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTEE,
MAHARASHTRA-441002

Email: aditiprabhudesai69@gmail.com

The aim of the present study was to overcome the problems associated with the techniques used to enhance the dissolution characteristics of poorly soluble drugs. To overcome the dissolution problems "Liquisolid Technique" was introduced and is also known as "Powder Solution Technology". By using this technique, ritonavir was found to be soluble more than 11.47% in selected solvent which is much higher as compared to solubility of ritonavir in water. Amongst the selected solvent Tween 20 was found to be most useful. Stability of ritonavir in the chosen non-volatile solvent was also studied. Ritonavir was found to be stable in Tween 20 for 15 days at room temperature. In formulations Neusilin US2 with MCC liquisolid produced the fastest disintegrating tablets, whereas Neusilin excipient when used without MCC produce hard slow disintegrating tablets. Combination of Neusilin (155.4mg) and MCC (200mg) showed the highest drug release. When compared to pure drug Ritonavir with liquisolid formulation, it was found that the prepared liquisolid formulation showed 28.11% increase in release than pure drug.

Keywords: Ritonavir, Neusilin US2, Tween 20, MCC, solubility enhancement, liquisolid technique.

PA-43: Formulation and Evaluation of Colon Targeted Aceclofenac Sodium Extended Release Tablets

DOKARIMARE NISHANT A*, WADHER KJ, KALAMBE P, RAI KK, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, MAHARASHTRA-441002

Email: nishant.dokrimare45@gmail.com

The aim of the present investigation was to develop and evaluate extended release matrix tablet of Aceclofenac for colonic delivery by utilizing the prolonged release characteristics of hydrophilic HPMC K100M with pH dependent solubility of Eudragit S-100 polymer. Extended release matrix tablet was prepared by direct compression method using combination of hydrophilic polymer HPMC and Synthetic Eudragit S100. FT-IR, DSC studies were carried out to study compatibility of Aceclofenac with the polymers. All the batches were evaluated for hardness, friability, weight variation, diameter, thickness, drug content uniformity and in vitro drug release. The drug and polymer were compatible with each other. Hardness, friability, weight variation, diameter, thickness, drug content uniformity and in vitro drug release uniformity were found within permissible limits for formulation. The optimized Batch HS3 provide targeting of Aceclofenac in the colon owing to its minimal release of the drug in the first 4 hr and give release up to 12 hr with 67.78%. The pH dependent extended release was achieved by coating matrix tablet with combination of HPMC K100 M with Eudragit S100, soluble at pH 7 due to formation of gel layer around the

core tablet.

PA-44: Folate Receptor Mediated Targeted Delivery of Docetaxel Micelles for Efficient Cancer Therapy

AGRAWAL PRANAV RAJESH*, AGRAWAL RD, TATODE AA, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, MAHARASHTRA-441002

Email: agrawalpranav007@gmail.com

This study aimed to generate targeted folic acid (FA) conjugated Docetaxel (DTX) loaded micelles that target the folate receptor which is over expressed on the tumor cells. The micelles were formulated using pluronic (PF) as a surfactant. The conjugate of FA and PF was synthesized (FA-PF) and it was further used for preparing the DTX loaded micelles (FA-PF-DTX) for specific delivery of DTX to folate receptor by using thin film hydration method. The prepared micelles were evaluated for entrapment efficiency (%EE), particle size, PDI, SEM, in-vitro release, cytotoxicity study and stability study. The average particle size and PDI of FA-PF-DTX was found to be 152.2nm and 0.514 respectively. From the SEM it was found that micelles are having spherical shape and drug conjugate entrapped in internal core of the micelles. The %EE was found to be 94.75±1.89%. The release rate after 24hrs of DTX from FA-PF-DTX conjugated micelles was found to be 80.25±1.53%. The result obtained during cytotoxicity study revealed that %cell viability of human breast adenocarcinoma cells was significantly lower for FA-PF-DTX

micelles than DTX solution. In stability study, FA-PF-DTX showed no significant change in formulation after one month as well as three month in accelerated storage condition. Finding of the study demonstrate that FA-PF-DTX have greater efficiency towards human adenocarcinoma breast cell lines and it is a promising targeting therapy.

PA-45: Modified Pear Starch as Novel Superdisintegrating Agent: Development and Evaluation

PISE PRAMOD V*, RAHATE S, NIKALAJE Y, UMEKAR M, TAKSANDE J

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, MAHARASHTRA-441002

Email: pramodpise14@gmail.com

Naturapolyceutics describes the emerging science that combines natural polymers and pharmaceuticals for the design and development of drug delivery systems. Natural excipients have wide pharmaceutical application. Present investigation was carried out to evaluate the extracted pear starch and modified pear starch as super disintegrating agent using cetirizine dihydrochloride as model drug. CTZ dihydrochloride is used to treat allergy in as antihistamine drug. Method: In present study, pear fruit was selected for the extraction and isolation of starch. The extracted pear starch modified by reacting with disodium hydrogen orthophosphate anhydrous at elevated temp. Result: Modified starch obtained was white, crystalline, non-hygroscopic powder and exhibited excellent flow properties. Also exhibited good swelling in water and pH 6.8 phosphate buffer, it is

considered as a promising superdisintegrant (SD) in tablet formulations. SD property of modified starch was compared with sodium starch Glycolate. CTZ dihydrochloride tablets (200mg) formulated employing starch phosphate by direct compression disintegrated within 1.20min exhibited fast disintegration and improved dissolution rate of tablets. Conclusion: Thus, starch phosphate, a modified pear starch, was found to be a promising SD in tablet formulations in a concentration of 10-25%. It was concluded that the modified pear starch as SD has appropriate potential for application in the formulation of fast dissolving tablets.

PA-46: Formulation and Evaluation of Sublingual Tablet of Nifedipine using Natural Superdisintegrants

TEKADE RITA D*, GAYAKWAD S, AWANDEKAR N, UMEKAR J

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: ritatekade2016@gmail.com

Aim of the present study was to formulate and evaluate sublingual tablet of nifedipine using natural superdisintegrants. Natural superdisintegrants were preferred over synthetic and semi synthetic agent because they were cheaper and abundantly available, non-toxic, non-irritating in nature. Sublingual tablet of nifedipine was prepared by direct compression method using natural superdisintegrant. All the batches (F1to F10) were evaluated for pre compression and post compression studies. Dissolution study was carried out in 7.4 pH buffer with 0.5% SLS. The

percent drug release for optimized batch (F3, F4) containing synthetic superdisintegrants was found to be 92.30%, 96.25% respectively whereas for optimized batch (F8, F9) containing natural superdisintegrants was found to be 94.83%, 97.36% respectively in 35 min. Disintegration time and percentage drug release for batch F9 was found to be 40 sec and 97.36% which showed better drug release than F3, F4 formulation. F9 batch was found to be optimized formulation. From the study it can be concluded that sublingual tablet of nifedipine containing plantago ovata husk as a natural superdisintegrants showed better disintegration and drug release profile than synthetic superdisintegrant. Hence it can be successfully used in the formulation of nifedipine sublingual tablet for the treatment of diseases like angina pectoris and hypertension.

PA-47: Formulation and Evaluation of Topical Nimesulide Emulgel using 23 Factorial Design

GAIDHANE ANJALI KRISHNAKUMAR*, WADHER KJ, PATEL D, UMEKAR MJ, MANE MM

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: anjaligaidhane115@gmail.com

The aim of present investigation was to design, formulate and Evaluate topical Emulgel of Nimesulide by utilizing 23 factorial designs. Emulgel is one of the recent technologies in Novel DDS used for dual control release of emulsion and gel for topical use. In the present Investigation, topical gel and emulgels of Nimesulide were prepared using Carboprol

934 as a polymer. A 23 factorial design was conducted to statistically optimize the formulation factors and to study the effect of independent variables on dependent variables. The Formulations were subjected to various physicochemical studies such as spreading coefficient and Viscosity. In vitro release of the formulations was performed to determine drug release from Gel and emulgel. Prepared topical emulgels of Nimesulide found to possess acceptable spreading coefficient and Viscosity. From the in vitro studies, formulation F4 showed maximum release of 59.58% in 240 min and 45.02% from the Gel respectively. In vitro release studies of the prepared formulation were performed using dialysis membrane and results indicated that Emulgel showed better release than Gel system.

Keywords: Emulgel, Topical Drug delivery, Nimesulide, Drug release kinetics.

PA-48: Formulation, Development and Evaluation of Tablet Containing Plant Extract of Momordica Dioica and Monochoria Vaginalis

MANKAR JAYSHREE V*, BAWANKAR A, BIYANI D, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: jayshreemankar9@gmail.com

Aim of present study was to evaluate anticancer activity of tuberous roots of Momordica dioica and aquatic plant of Monochoria vaginalis and to formulate and evaluate an oral dosage form for the treatment of cancer. The extraction of Momordica dioica

and Monochoria vaginalis was carried out by soxhlet extraction method. Antimitotic activity was detected by using allium cepa roots by using water, methotrexate, M. dioica, M. vaginalis. Tablets were formulated by direct compression method. Precompressional studies and postcompressional studies were carried out. Combination of Momordica dioica and Monochoria vaginalis showed less mitotic index and highest mitotic inhibition followed by M. vaginalis, M. dioica, Methotrexate and water. Herbal tablets were prepared by direct compression method. Tablets were evaluated on the basis of drug content and drug release profile and gave satisfactory and acceptable results. The potent antimitotic activity of Momordica dioica and Monochoria vaginalis confirms the anticancer activity.

PA-49: Evaluation of Marketed Shampoo (Herbal and Synthetic)

BISWAS SUNNICA*, LOHIYA RT, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: sunnicabiswas1996@gmail.com

Aim of present study was to evaluate and compare synthetic and herbal marketed shampoos according to various BIS standards. Natural herbal Shampoo: Vatika Health Shampoo (Satt Poshan); Kesh King Anti-Hair fall Ayurvedic Medicinal Shampoo; Ayush Thick and Long Growth Shikakai Shampoo (Shikakai and Bhringamalakadi Tailam); Synthetic Shampoos: Chick Protein Solution Hair fall Prevent black Shampoo; L'Oreal Paris Total Repair 5 Advanced Repairing Shampoo

were evaluated based on different parameters such as physical appearance, pH, viscosity, surface tension, % solid content, wetting time, foaming capacity, dirt dispersion and cleansing action and were compared. All formulations were within the pH range of 6.3-7.4 i.e. nearly neutral pH. Evaluation parameters revealed that L'Oreal Paris, Chick and Vatika were of good foaming and wetting ability. Cleansing action of L'Oreal and Kesh King Shampoo was good and removed grease from hair easily. All the shampoo formulations were of good quality. Out of which L'Oreal Paris is worth to cost. Vatika and Kesh King are Indian brand shampoos which are herbal and economic.

PA-50: Formulation and Evaluation of Liposomal in-situ Gel for Nasal Delivery

RAI KARANDEEP KAUR R*, SHUKRE AS, DOKARIMARE NA, TRIVEDI RV, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, BEHIND RAILWAY STATION, KAMPTEE, DIST-NAGPUR, 441002

Email: raikarandeepkaur0@gmail.com

Aim of present study was to prepare and evaluate liposomal in-situ gel of Pramipexole dihydrochloride for nasal delivery. Liposomes were prepared using thin film hydration technique using phospholipids (Soya Lecithin and Egg Lecithin), cholesterol and Pramipexole in different ratios. The formulation were characterized for entrapment efficiency (EE%), particle size, in-vitro drug release, drug leakage. Optimized Liposomal formulation was selected for preparation of in-situ nasal gel using polymers as HPMC K4M and Carbopol 934. It was further evaluated for pH, in-vitro gelation,

drug content and ex-vivo permeation studies. The results of studies exhibited that in-situ nasal gel (G4) using Soya Lecithin and (G9) of Egg Lecithin were considered best with pH 6.033 ± 0.4509 and 6.000 ± 0.4000 . Percent drug content were 97.13 ± 0.7499 and 99.12 ± 0.3119 . Both formulations showed sustained drug release of 17.57 ± 0.130 and 38.87 ± 6.768 for 5 hours. The in-vitro gelation study showed immediate gel formation. The formulations of G4 and G9 can be considered as a competent alternative to the conventional nasal drops. It showed enhanced bioavailability and longer residence time by overcoming the problems of first pass effect and reduction in dosing frequency.

PA-51: Formulation of Nano-Featured Silk Fibroin Patch of Herbal Drug

GUPTA NEHA SHIVBARAN*, NILAWAR NR, HEMKE AT, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA- 441002

Email: nehashivgupta@gmail.com

The aim of the present investigation is to formulate the Nano featured silk fibroin substrate of herbal drug. The silk fibroin patch formulated by using the silk fibroin solution was isolated from silk cocoons which are used as natural polymer. Solvent casting technique was used for the fabrication of NFSP patch. Formulation of herbal drug was sonicated for 1-2 hrs to remove the entrapped air bubble, the resultant homogenous dispersion was spread over a film former with the help of dragger at $50^\circ\text{C} \pm 5^\circ\text{C}$. Dried film was cut into required dimension. The prepared

patches of herbal were wrapped in aluminium foil. The Nano featured silk fibroin patch of herbal drug was formulated and wrapped in aluminium foil. The patches were prepared using the combination of polymer, HPMC and silk fibroin solution in different concentration with polyethylene glycol 400. On the basis of evaluation, it concluded that the silk fibroin patch formulated successfully with required dimension.

PA-52: Sustained Release Ciprofloxacin Hydrochloride Microspheres: Influence of Different Formulation Variables

KHAPNE AJIT KISHOR*, WADHER KJ, NAGARKAR A, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA- 441002

Email: ajitkhapane0@gmail.com

The aim of present study was to formulate and evaluate Ciprofloxacin HCL microspheres using Meth acrylic acid esters and to investigate the effect of various formulation variables. Microspheres were prepared by solvent evaporation method. The prepared microspheres were evaluated for drug content and entrapment efficiency. The in vitro release study was performed in pH 7.4 phosphate buffer. Prepared Ciprofloxacin HCL microspheres using Meth acrylic acid esters were found to have significant effects on entrapment efficiency, particle size and practical yield of microspheres. Scanning electron microscopy study revealed that the microspheres were spherical and porous in nature. In-vitro data

obtained for ciprofloxacin HCL microspheres showed good prolonged drug release. The yield per cent the actual drug content and the incorporation efficiencies of the prepared microspheres increased with increasing the drug: polymer ratio. Entrapment efficiency value found to be high with Eudragit L 100, and it increased with increasing the polymer ratio. Particle size found to be increased and decreased in percentage yield.

Keywords: Ciprofloxacin, Eudragit L100, Solvent Evaporation Technique, Stirring time, Tween 80, Span 80.

PA-53: Formulation and Evaluation of Neem Oil Liposomes Prepared with Natural Saponin for Topical Delivery

BHOYAR SUKESHINI U*, GHODESWAR MD, AWANDEKAR NB, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA- 441002

Email: sukeshinibhojar25@gmail.com

Neem oil is a vegetable oil pressed from the fruits and seeds of the neem (*Azadirachta indica*). Neem oil is the effective oil mostly used in the transdermal drug delivery for the treatment of Acne, Psoriasis, and Eczema. They are also used for as antifungal and antibacterial agents. The aim of the study was to prepare liposomes carrier of neem oil for the treatment of transdermal delivery that is capable of delivering the neem oil to specific site by using different ratios of cholesterol and saponin by film hydration technique. Liposomes containing neem oil were prepared by lipid

layer hydration technique using saponin and cholesterol. The prepared liposomes were evaluated for drug entrapment, particle size analysis and in-vitro drug release study. From different ratios, the ratio 1:1 (cholesterol: saponin) exhibited high entrapment efficiency i.e. 86.67% with minimum particle size 2.52µm and prolong release of neem oil (86.22%) and saponin (83.21%) upto 6 hours. The prepared liposomes showed the good organoleptic properties and spreadability. From the above result it could be concluded that the liposomes entrapped with neem oil could be efficiently formulated with good efficacy for topical delivery having prolonged release of drug.

PA-54: Development and Evaluation of Lamotrigine Soya Lecithin Solid Dispersion: In Vitro and Pharmacodynamic Investigation

RAHATE SONIYA W*, PISE PV, GAUTAM SA, UMEKAR MJ, TAKSANDE JB

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA- 441002

Email: soniyarahate04@gmail.com

Epilepsy is common neurodegenerative disorder characterized by spontaneous and repeated attacks of convulsions. It requires immediate pharmacotherapy to prevent its progression to status epilepticus. However, most of the anticonvulsant drugs are poorly water soluble and demonstrate delayed onset of action. Thus there is a need to improve its solubility for better pharmaceutical profile.

The aim of present investigation was to enhance solubility and dissolution profile of new anticonvulsant drug lamotrigine by solid dispersion technique employing soya lecithin phospholipid. Solid dispersions of lamotrigine were prepared with soya lecithin by solvent method. Ethanol increased lamotrigine solubility with soya lecithin in ratio 5:1. XRD and DSC study indicated a smaller crystallite size of lamotrigine. The resultant solid dispersion also significantly delayed the onset of clonic convulsion (875.8 s) as compared to control (85.5 s) and offered complete protection (100%) against the pentylenetetrazole induced seizures in rat compared to control (33.33%). In addition solid dispersion with maximum drug content (77.68%) and dissolution rate (91.40%) was formulated as orodispersible tablet and characterized for its pharmaceutical properties. It can be concluded that solid dispersion of lamotrigine incorporated with soya lecithin demonstrated enhanced solubility and dissolution rate may have potential clinical application.

PA-55: Formulation and Characterization of Atazanavir for Transdermal Patch

GADDAMWAR NILAM VIJAY*,
DHUDHEKAR R, RAUT N, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTEE, NAGPUR,
MAHARASHTRA- 441002

Email: nilamgaddamwar33@gmail.com

Aim of present study was to formulate transdermal patch of anticancer drug atazanavir sulphate for the localized action and systemic effect in sustain release manner.

The atazanavir sulphate identification and characterization were carried out by melting point determination, UV, FTIR and solubility studies. The transdermal patch of Atazanavir sulphate was prepared and evaluated for thickness of patch, moisture content determination, drug permeation study by using Franz's cell and dissolution study. Atazanavir sulphate showed that UV absorbance at λ_{max} 247.0 nm, the spectrum was confirmed with the reference. The FTIR spectrum of atazanavir sulphate exhibited all the functional group peaks as observed in reference, suggested chemical stability of Atazanavir. The physical appearance of the prepared patch was clear whitish with smooth texture, flexible and transparent. The thickness of patch was 0.23 μ m and folding endurance 236.66. The % drug content determination was found to be 86.74 47.04% and diffusion study indicated 90.57% diffusion through Franz Diffusion cell. The release for atazanavir sulphate was extended till 10 hours through transdermal patch indicated sustained release. The Atazanavir transdermal patch prepared and evaluated for release indicated proper diffusion through membrane for sustained period which would be more beneficial for the treatment of HIV.

PA-56: Isolation and Characterization of Biopolymer from Cicer Arietinum Seeds as a Novel Bio-Excipient for Novel Drug Delivery System

KUMAR SUSHANT*1, MADHAV NV.
SATHEESH2, VERMA ANURAG3,
PATHAK KAMLAI

1PHARMACY COLLEGE SAIFAI, UTTAR
PRADESH UNIVERSITY OF MEDICAL
SCIENCES, SAIFAI, U.P.-206130; 2FACULTY OF
PHARMACY, DIT UNIVERSITY, DEHRADUN,
U.K.-248009; 3SCHOOL OF PHARMACEUTICAL
SCIENCES, IFTM UNIVERSITY, MORADABAD,
U.P.-244001

Email: k.sushant25@gmail.com

Aim of this research work is the isolation and characterization of biopolymer from natural edible sources like Cicer arietinum seeds. 200gm of gram seed was taken and were soaked in water overnight. After swelling of the seeds the upper covering of the seeds were removed and then was grinded in mixer. The obtained paste like juice was filtered through the muslin cloth. The filtrate was collected and the filtrate was centrifuged to remove the sediment and the supernatant was taken. The supernatant was treated with acetone and methanol in ratio of 1:1, 1:2 and 1:3. This was kept in refrigerator for 24 hours. Then precipitate was again centrifuged. Now the sediment was collected and supernatant was also collected separately and both were dried to get dried powder after passing through the sieve no 120. It was washed with chloroform or acetone to get the free flowing powder. The isolated biopolymer was the characterized for different physicochemical and spectral analysis. The Yield was found to be 10 $\pm$ 02 %. The isolated biopolymer was light yellowish color in appearance and found to be sparingly soluble in water. This showed the presence of carbohydrate and protein. The mass, I.R, NMR spectral analysis showed the polymeric properties as the natural standard polymer. From the different physicochemical characterization it is confirmed that the biopolymers consist of novelistic biopolymeric properties.

PA-57: Development and

Evaluation of an Herbal Fracture Healing Plaster

KUMAR AADESH*, RANA M, BISHT M, GAIROLA PRIYANKA, HIMANSHI

DEPARTMENT OF PHARMACEUTICAL SCIENCES, KUMAUN UNIVERSITY, BHIMTAL, UTTARAKHAND-263001

Email: dhariwalaadesh13@gmail.com

Peristrophe Bicalyculata a perennial herb used traditionally for the treatment of sprain, bone fracture and also possess number of therapeutic properties such as expectorant, analgesic, anti-inflammatory, antipuretic and antibacterial. Transdermal patches were developed successfully by solvent casting method using other polymers and ingredients mixed with ethanolic extract of Peristrophe bicalyculata. The patches were further evaluated for thickness, folding endurance, moisture content and moisture reuptake. Best five formulations were selected for drug content and in-vitro drug release. The patches showing drug content more than 90% and drug release 85% were selected as best patch. The final formulation was further studied for pharmacological activity. Six male Wister rats having 250-350gm body weight were selected for the animal activity. Fracture was induced by three point pressure method. The plaster containing herbal patch of Peristrophe bicalyculata represents fast healing activity in comparison to the simple plaster after the completion of the study period. This study will help the patients of bone fracture by reducing the side effects of NSAIDs and by reducing the time in healing.

PA-58: Design and Development of Nanosized

Valsartan Loaded Transdermal Film

AMRITA MISHRA*, SAPNA NEGI, MADHAV SATHEESH N V, BHAVNA

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, UTTARAKHAND-248009

Email: ammy8055pca@gmail.com

Transdermal drug delivery is an alternative approach for oral routes, to deliver specific dose of medicament through the skin and reaching into the blood stream. The current objective of the work is to develop and evaluate nanosize valsartan loaded transdermal film. The method used for the preparation of transdermal film is film casting method in which we used biopolymer extracted from Sesame indicum (Sesame). The prepared film was evaluated using various parameters such as weight uniformity study, folding endurance, moisture uptake, percentage uptake, surface pH. The best formulation was further evaluated by in-vitro and ex-vivo study. The result showed that nanosize valsartan loaded transdermal film of sesame indicum having a moisture uptake is 24.44 ± 0.462 , weight uniformity is 22.14 ± 0.01 and thickness range is 0.146 ± 0.005 . A slow release kinetics was observed which was best fitted in Peppas Korsmeyer release profile.

Keywords: Transdermal drug delivery, Transdermal film, Sesame indicum (sesame), Valsartan.

PA-59: Design and Development of Self Nano-emulsifying Drug Delivery (SNEDDS) of Zidovudine

PATHAK VAISHALI*, BHATT PRIYANKA,

MADHAV. N.V. SATHEESH

Faculty of Pharmacy, DIT University, Dehradun, Uttarakhand-248009

Email: vaishalipathak18@gmail.com

Self Nanoemulsifying Drug Delivery (SNEDDS) has emerged as a propitious scaffold to improve the rate and extent of absorption of hydrophobic drugs. The current objective of our research work is to isolate a novel bio material from the seeds of Vigna mungo and to evaluate its bio emulsifying ability by formulating Zidovudine loaded self-nanoemulsion. Five drug loaded Self Nanoemulsifying formulations were formulated (VM1- VM5) using Zidovudine as a model drug, Vigna mungo as a bioemulsifier cum bioretardant and methanol as a co-surfactant. Similarly standard formulations (SM1-SM2) using Tween 80 as surfactant and transcitol as co-surfactant were formulated by aqueous titration method. All the formulations were semi solidified by using lactose as an adsorbent through solid carrier technique. The prepared formulation was subjected for various evaluation parameters like pH, globule size, drug content, viscosity, robustness to dilution, rate of drug release and in vivo studies on rabbits. A slow release kinetics was observed by Fickian Diffusion (Higuchi Matrix) and the best fit model in Peppas Korsmeyer. The best formulation (VM5) showed R² value 0.9549, t_{30%} and t_{50%} 27 min and 5.6 hour. Therefore, it was concluded that a novel biopolymer isolated from Vigna mungo can serve as a novel- bioemulsifier for formulating various drug loaded SNEDDS.

Keywords: Self – Nanoemulsifying Drug Delivery (SNEDDS), hydrophobic drugs, Vigna mungo, Zidovudine, bioemulsifier, bioretardant.

PA-60: Surface Modified-

Nanoparticles for Intranasal Delivery: Formulation and Characterization

CHANDEWAR SHITAL ANIL*, JAWANJAR S, BIYANI D, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: shitalchandewar@gmail.com

The aim of the present study is to prepare surface modified-nanoparticles and characterize it's physicochemical and functional attributes for nose-to-brain drug delivery. The present study, Quercetin nanoparticles were developed in order to accomplish poor aqueous solubility of Quercetin and enhancement of drug absorption rate to nasal mucosa by increasing drug retention time using single emulsion technique. For this purpose, Eudragit® RS 100 was chosen as mucoadhesive polymer and used at different drug / polymer ratios in the nanoparticles formulation. The lyophilized nanoparticles were evaluated with respect to the drug loading, entrapment efficiency, solubility analysis, particle size, mucoadhesive property, in vitro drug release, in vitro drug diffusion, ex vivo permeation study, FTIR and XRD study showed molecular dispersion and conversion of the drug into amorphous form. The solubility studies of Quercetin Nanoparticles were found to be increased than pure Quercetin. Nanoparticles showed adequate mucoadhesion, the mucoadhesive potential of optimized Quercetin Nanoparticles showed a higher percentage of mucoadhesion and do not have any destructive effect on nasal mucosa. The results suggest that above Nanoparticles formulation has the potential for nose to brain drug delivery improved permeation profile for

longer period of time and thereby increasing the patience compliance.

PA-61: Formulation and Evaluation of Metformin Loaded Curcumin-Lycopene Nanoparticles for the Treatment of Diabetes Mellitus Type II

CHAUDHARY NISHA*, SHUKLA V

AMITY INSTITUTE OF PHARMACY, AMITY UNIVERSITY, NOIDA, UTTAR PRADESH - 201313

Email: 123nisuchaudhary@gmail.com

Diabetes mellitus is a metabolic disorder that is illustrated by hyperglycemia (a condition of increased blood glucose level) and insufficiency in the production or action of insulin produced by the cells in the pancreas, called the islets of langerhans. The two naturally occurring potent anti-oxidants i.e. Curcumin, obtained from curcuma longa and lycopene, obtained from Solanum Lycopersicum which can be utilized for the treatment of oxidative stress were utilized for the development of Curcumin.-Lycopene conjugate based biguanide Niosomes. Span 60 as non-ionic surfactant and cholesterol as a stabilizer are used for the preparation of Metformin Hydrochloride loaded Niosomes by the Ethanol Injection Method. This poster deals with the composition, formulation, evaluation, and optimization of Niosomes.

Keywords: Curcumin-Lycopene conjugate, Niosomes, Metformin Hydrochloride, Ethanol Injection Method, Span 60.

PA-62: Regulations of

Clinical Trials for Paediatric Product Development

JUNEJA SAKSHI*, THAKKAR A

AMITY INSTITUTE OF PHARMACY, AMITY UNIVERSITY, NOIDA, UTTAR PRADESH - 201313

Email: sakshijuneja09@gmail.com

Pediatrics is defined as anybody 21 or younger at the time of treatment and classified as neonates, infants, children & adolescents. As pediatric population lacks the decision making capacity to engage in any research hence, they are considered special population. But on the other hand, it is necessary to include them in research for their product development. Thus, main aim of the present work is to evaluate and compare different clinical trials regulations for pediatric population by CDSCO, ICH, EU and USFDA. In India, CDSCO pays emphasis on consent from parent/legal guardian and including them for new drug when there is no therapeutic option available. Whereas in US, pediatrics shall only be included if other subjects cannot meet the public health objective, the risks should be low and children should only be enrolled if it's necessary. Utilization of pediatric physiologically based pharmacokinetic (PBPK) model for pediatric clinical trials was reviewed. The guidelines from the regulatory bodies were thoroughly evaluated and reviewed. Also, in USFDA, there is a provision for the registration of the pediatric drug products using the PBPK modeling and analysis. To conclude, clinical trials for pediatrics are regulated in a different way than adults and focus should be made more on PBPK modeling and simulation to avoid unnecessary clinical trials in this special population.

PA-63: Development and

Characterization of Effective Topical Liposomal System for Localized Treatment of Cutaneous Candidiasis

SANDEEP SAINI*, GUPTA MADHU*

DEPARTMENT OF PHARMACEUTICS, DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH, NEW DELHI-110017

Email: sandeepsaini1644@gmail.com

The topical application of fluconazole by conventional medication is a extensive restraint in accomplishing its therapeutic efficacy against skin infections, like cutaneous candidiasis. So, this study was aimed to prepare fluconazole loaded vesicular construct, like liposomes, niosomes which was incorporate into carbopol gel (1%w/w) for sustain , topical application. The noisome and liposomes were made by the lipid/nonionic surfactant-which was based dry -flim hydration method and characterization on different parameters. Moreover antifungal activity was found with experimentally generated cutaneous candidiasis in immunosuppressed albino rats. The size of liposomes and niosomes was observed to be 0.348 ± 0.054 and $0.326 \pm 0.033 \mu\text{m}$ with encapsulation efficiency of 31.8 ± 1.36 and $27.6 \pm 1.08\%$ which was proved by the results of study. The skin retention studies manifested remarkable presence of drug with liposomal gel of fluconazole from in vitro and in vivo experiments. The liposomal gel induced 14.2 fold more drug accumulation as compared with plain gel, while niosomal gel with same dose application induced 3.3 fold more accumulation in in vivo localization in viable skin. The maximum therapeutic activity was proved by the antifungal study, as lowest of cfu/ml was

showed liposomal fluconazole application. The studies proves efficacy of liposomal gel for topical application of fluconazole with higher accumulation of drug in various part of skin.

PA-64: Eye to Brain an Approach to Target Neurodegeneration

BHAVNA*, DEEPIKA SHARMA

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, UTTARAKHAND-248009

Email: bhavna@dituniversity.edu.in

Neurodegenerative diseases represent a major threat to human health. These age-dependent disorders are becoming increasingly prevalent, in part because the elderly population has increased in recent years. The increasing prevalence of Alzheimer's, Parkinson's and other neurodegenerative disorders requires the search for novel mechanisms (molecular, cellular, physiological and pathogen-associated). Eye to brain is a novel approach for targeting the central nervous system disorders. The eye offers a natural window to the brain as the retina; the light-sensitive layer lining the interior of the eye is considered part of the central nervous system (CNS) and the only optically accessible nervous tissue. The acute or chronic drug treatments for different neurodegenerative disorders are challenging from several aspects. The low bioavailability and limited brain exposure of oral drugs, the rapid metabolism, elimination, the unwanted side effects and also the high dose to be added mean both inconvenience for the patients and high costs for the patients, their family and the society. The reason of low brain penetration of the compounds is that they have to overcome the blood-brain barrier (BBB) which protects

the brain. Eye to brain drug administration is one of the promising options to bypass blood-brain barrier, to reduce the systemic adverse effects of the drugs and to lower the doses to be administered.

PA-65: Isolation of Biopolymer from Zea Mays Seeds and Their Characterization

PANDEY SWARNIMA1*, KUMAR SUSHANT2, GUPTA AMRESH1, MADHAV NV SATHEESH3

1GOEL INSTITUTE OF PHARMACY & SCIENCES (GIPS), LUCKNOW, U.P. -227105; 2PHARMACY COLLEGE SAIFAI UPUMS, SAIFAI, U.P.-206130; 3FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, U.K.-208009

Email: yesgoldi@gmail.com

Aim of present study was to isolate the bio-polymer from the seeds of zea mays and its characterization. The 200 gm of Zea mays seeds was soaked in water overnight. Then upper covering was removed. Add 50 ml of water and grinded in mixer and this was filtered through the muslin cloth. The filtrate was centrifuged and then supernatant was taken. This was treated with acetone and methanol in 1:1, 1:2 and 1:3 ratios. This was kept in refrigerator and precipitate was separated with centrifuge. The residue was collected and dried in oven. This was sieved through sieve no. 120. The free flowing bio-polymer was collected and packed in air tight container. The % yield of bio-polymer was found to be 8.2%. Then it was characterized for spectral analysis which showed the polymeric nature of bio-polymer. The isolated bio-polymer showed the novel characteristics which can be used in drug

targeting as well as for controlled release of the drug.

PA-66: OTC Medication- An Uphill Journey

NEHA, PROF*, P.K.SAHOO

DEPARTMENT DELHI INSTITUTE OF
PHARMACEUTICAL SCIENCE AND RESEARCH
(DIPSAR) NEW DELHI, INDIA

Email: nehas11990@gmail.com

Over the counter (OTC) drugs also known as non-prescription drugs are those medications which can be obtained without a Registered Medical Practitioner and can be easily purchased in pharmacies, grocery stores, and convenience stores. OTC as “Drugs are substances intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease”. Their significant action and easy availability makes OTC most purchased drugs in various countries. There are over 80 therapeutic categories of OTC drugs which can be grouped in 12 broad therapeutic classes. Accessibility, affordability, trust and empowerment attributes epitomize the value OTC medicines provide consumers and nation’s healthcare system. OTC retail sales totaled \$17 billion in 2010. The center for drug evaluation and research division of the FDA OTC medications to ensure that they are properly labeled, their benefits outweigh their risks, their potential for misuse and abuse are low, and their health practitioners are not needed for their safe and effective use. OTC medications represent a diverse group of widely available drugs and their use will increase and will be continued to rise. Consumers, healthcare professionals, and public health officials recognize the convenience and efficacy of OTC medicines and their value in providing

numerous options for common and minor illness. Their wide availability greatly advances individual and public health. These drugs are safe and effective when used as directed.

PA-67: Design & Development of anti-cancer drug loaded lignin nanoparticles for the treatment of breast cancer

AAKASH SONI*, VANDANA PRASAD,
MANSI GUPTA, DR. SUSHAMA
TALEGAONKAR

DEPARTMENT OF PHARMACEUTICS, DELHI
INSTITUTE OF PHARMACEUTICAL SCIENCES
AND RESEARCH, NEW DELHI-110017

Email: aakashsoni1908@gmail.com

Biopolymers are emerging as a promising nanomaterial platform because they integrate several important properties which have advantages such as its ease of availability, inexpensive and biodegradability. The lignin nanoparticles were prepared by solvent displacement using dialysis bag. The parameters were optimized by Design Expert-Faced centered central composite design. The drug was loaded by physical adsorption method. Maximum drug loading obtained 20.73%. Result: The size of the drug loaded nanoparticles was found to be 220 ± 20 nm when measured by PSS. TEM image of DLLNPs shows the particle size of 250 nm. The drug loaded lignin nanoparticles exhibited a cumulative % release of $62.11 \pm 7.4\%$ of the loaded drug in 24 hrs whereas it showed a cumulative % release of $97.007 \pm 4.5\%$ of drug in 48 hrs. MTT Assay was performed on the MCF-7 breast cancer cell line with the drug solution. The drug loaded lignin

nanoparticles exhibited the greater effect as compared to pure drug. This shows that the formulation (DLLNPs) is killing the MCF-7 cells very effectively with the loaded drug. The IC50 value of formulation is less as compared to that of free drug so dose minimization can also be achieved. The developed formulation was found to have advantages over the conventional anti-cancer drug formulation such as decreased dose, decreased dosing frequency, lower toxic effects and cost of treatment.

PA-68: Design and Development of Novel Oral Mucosal Films for Oral Cavity Ulcers

GUPTA MANSI*, KHULLAR SHAGUN,
SONI AAKASH, TALEGAONKAR
SUSHMA

DELHI INSTITUTE OF PHARMACEUTICAL
SCIENCES AND RESEARCH, NEW DELHI-110017

Email: mansigupta72696@gmail.com

Aim of present study was to design and develop novel oral mucosal films. Solvent casting: In this method, water soluble polymers are dissolved in suitable solvent and the drug along with other excipients is dissolved in other suitable solvent. Then both the solutions are mixed and stirred. Followed by degassing under vacuum to settle the air bubbles and is then finally casted into petri plate and dried. Melatonin was obtained as white-cream to yellowish crystalline, odorless powder and acicular shaped crystals with melting point of 117°C . It was sparingly soluble in PBS pH 7.4 and water but very soluble in solvents. A drug excipient compatibility study was carried out with different excipients. Optimized film was found to be flexible, transparent, smooth, non-sticky,

and homogeneous containing 96.21% drug and pH of film was 6.70 ± 0.01 . The moisture loss in the optimized formulation was found to be low i.e. 4.65. The tensile strength of the formulation was 0.173 kg/cm^2 . The In-vitro disintegration time of the optimized film was about 31.8 sec with maximum release of $97.5 \pm 1.3\%$ after 30 min. Fast dissolving film of melatonin was successfully developed and has a good potential to retain the drug in the oral cavity with good in vitro and in vivo characteristics at laboratory scale. Hence, developed fast dissolving film formulation can be a new era of drug delivery in future.

PA-69: Carbon nano tubes : Advanced drug delivery system

SRIVASTAV A*, GUPTA M

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, UTTARAKHAND- 248009

Email: akanksha28.srivastav@gmail.com

Carbon nano tubes (CNT) are designed hexagonal arrangement of carbon with diameters measured in nanometers. CNT can be single-walled or multi-walled depending upon the application potential. CNT posses the ability to attract sufficiently great interest as it owns the various combinations of properties, because of which it becomes worthy for a vast range of applications in scope from electronics to biotechnology. The production of CNT includes the transformation of carbon sources into nano tubes conventionally at high temperature and low pressure at which manufacturing conditions governs the characteristics of the final product. Various methods have been designed and developed for manufacturing of CNT, from which widely used

is gas phase catalytic processes. Mostly three methods are used for manufacturing of CNT i.e, Chemical vapor deposition (CVD), Laser ablation technique and Carbon arc- discharge technique. Both single-walled and multi-walled type of CNT posses no ability to cross the cell therefore, they have to be functionalized or activated in order to permeate or cross the membrane of the normal cell and also more particularly for targeting the cancer cells. Therefore, CNT shows their valuable results in treating cancers as it carries various physical, chemical and mechanical properties, which provide them ability of a potent biological carrier to deliver anticancer drugs.

PA-70: CANCER

ABHISHEK PATEL*, MANJU PANDEY, MEHSEEN

AZAD INSTITUTE OF PHARMACY & RESEARCH NATKUR, LUCKNOW UTTAR PRADESH 226008

E-mail: patelabhi7398@gmail.com

Cancers are a large family of diseases that involve abnormal cell growth with the potential to invade or spread to other parts of the body. They form a subset of neoplasms, A neoplasm or tumor is a group of cells that have undergone unregulated growth and will often form a mass or lump, but may be distributed diffusely. Some cancers may cause specific groups of systemic symptoms, termed paraneoplastic phenomena. Auto immune diseases Hormones ,Physical agents, Heredity Radiation, Infection , Diet and exercise, Physical inactivity and obesity . Chemicals-Tobacco,Alcohol etc. Sometypesofcancer are Carcinomas, Sarcomas. Leukimias and LymphomasAs a cancerous tumor grows , the lymphatic system carry cancer cells to other parts of body. During this process, known as metastasis, the cancer cells grow and may develop into new tumors. One of

the first places a cancer often spread is to lymph node. Cancer may also spreadthrough the blood stream to distant parts of body.PURPOSE OF CANCER TREATMENT IS THAT- *cancer improves,*the disease is brought under control *cancer reocrrence is prevented.The main forms of treatment are cancer surgery, radiotherapy, chemotherapy, hormone therapy.DIAGNOSIS- Cancer detection is based on biopsy and histopathological study of tissue and blood and bone marrow test for increasing cell counts in case of leukemias. Techniques like radiography,CT and MRI are useful to detect cancers.

PA-71: Folate-appended lipid nanoparticles for targeted co-delivery of docetaxel and curcumin to lung carcinoma cells

PATEL MAYUR*RAWAL SHRUTI, BORA VIVEK, MATHUR PRATEEK, MEHTA ANKITA, PATEL BHOO MIKA,

INSTITUTE OF PHARMACY, NIRMA UNIVERSITY, AHMEDABAD – 382481, GUJARAT

Email: drmayurmpatel@gmail.com

The present research work elaborates development and characterization of a novel folate appended dual-drug loaded nanostructured lipid carriers (NLCs) for lung carcinoma therapy. To benefit from targeting ability of folate and synergism of combination of docetaxel and curcumin (1:2 molar ratio), their co-loaded NLCs (FA-DTCR-NLCs) were developed by employing hot high-pressure homogenization technique. The cytotoxicity studies using NCI-H460 (lung carcinoma) cell line showed a significant reduction in cell

viability in the cell treated with FA-DTCR-NLCs as compared to the cells treated with unconjugated NLCs. The cell uptake analysis of FA conjugated coumarin-6 (C6) loaded NLCs clearly depicted the role of overexpressed folate receptor in facilitating endocytosis of FA-DTCR-NLCs. The in-vivo pharmacokinetics demonstrated a significantly higher bioavailability (~12.39 folds) than commercial product. In-vivo pharmacodynamic studies in mice model showed significant amelioration in antitumor response with significantly lower off-target toxicity in FA-DTCR-NLCs treatment groups revealing their superior safety and efficacy. The results of the study demonstrate that the developed FA-DTCR-NLCs could be used as a promising tool for the treatment of NSCLC.

PA-72: To formulate and evaluate uncoated tablets of metformin and glibenclamide 650 mg

**DANU MITALI*, ARYA RAJESHWAR KK
KUMAUN UNIVERSITY BHIMTAL-263136,
UTTARAKHAND**

Email: danumitali10@gmail.com

Metformin and glibenclamide is mainly used for treatment of diabetes. The study set out to improve physical and chemical characteristics of present formulation. The materials and methods were procured by the company and selected to meet the quality and to make cost effective. Preformulation studies were performed to characterize the drug and excipients for best formulation. Many preformulations studies were done like identification of drug, solubility of drug, compatibility, melting point determination,

loss on drying, angle of repose, bulk density, tapped density, Carr's Index. From obtained results it can be concluded that: 1. the uncoated tablets were successfully prepared by wet granulation using varying concentration of binding agent. 2. Uncoated tablets were prepared by using PVPK-30 and Sodium Starch glycolate. 3. Content Uniformity was found to be 100.7% and friability of different formulation was found between 0.11% to 0.73%. 4. Highest cumulative % drug release was 95.86% which was in line of marketed formulation 95.25%. Dissolution studies revealed that the drug release was acceptable with optimized formulation. 5. Selected wet granulation method has proved proper flow property of blend, content uniformity and proper compression of blend.

PA-73: Formulation and evaluation of drotaverine hydrochloride sustained release tablets

**BHAMBAR KUNAL V*, PANDE SHRIKANT
D2, BHAMBAR RAJENDRA S**

**TMGV'S PHARMACY COLLEGE, PANCHAVATI,
NASHIK-422003, MAHARASHTRA**

**2VIDYABHARATI COLLEGE OF PHARMACY,
AMRAVATI-444602, MAHARASHTRA**

Email: kunalbhambhar@gmail.com

To develop suitable formula and procedure to sustain the drug release of prepared tablets. The direct compression technique was followed to manufacture the Drotaverine hydrochloride tablets for all batches containing Drotaverine hydrochloride. Polymers were passed through sieves. Magnesium stearate was passed through # 60 sieves. Weighed amounts of drug as well as all other ingredients were blended. The

blend was compressed on 10-station rotary press using Round shaped punches. All the prepared matrix tablets were yellowish in color having smooth surface. The thickness of all the formulations ranges from 4.60-5.10 mm. In weight variation test the average percentage deviation of all the formulations was found to be within the limit. It was also found that all batches show percent drug content more than 95 %. The tablet hardness were found in the range 6.1-7.0 kg/cm² and friability was less than 1 % within the acceptable limits. The dissolution study shows that formulation MT-8 shows maximum drug release 99.63% at the end of 12 hours while MT-1 shows least 82.64% at the end of 12 hours. Drug release rate was slower with higher concentration of polymers. The highest *r* value was obtained for Higuchi model, so diffusion was the predominant release mechanism for matrix tablets. Mechanism of drug release was swelling, chain relaxation followed by diffusion and erosion and the drug releases by first order phenomenon.

PA-74: Brain targeting drug delivery system

**SRIVASTAVA ANCHAL*, KUMAR
SUSHANT, PANDEY SWARNIMA**

**GOEL INSTITUTE OF PHARMACY AND
SCIENCES, LUCKNOW-226028-UTTAR
PRADESH**

Email: anchal.srivastava1305@gmail.com

Drug delivery to the brain are always a challenging task for the formulation scientists for development of formulation, because the presence of blood brain barrier (BBB) with tight junction in the brain endothelial cells causes the low permeation of drug. For overcome these challenges use numerous traditional approaches such as prodrugs, disruption of blood brain



barrier, have shown some success to delivered the drug across the blood brain barrier. The overall prevalence rate for CNS pathology has demonstrated that approximately 1.5 billion people undergoing from disorders of central nervous system. Blood brain barrier play a major role in drug deliver to the brain. It has tendency to impair the drug distribution and causes the difficult is for the development of CNS drug. The most important point of drug development for CNS are the net amount of drug delivered (medicinal agent) and it's capability to gain access to the pertinent target sites. In order to distribute the drugs into the CNS via passing the blood brain barrier, many new emerging approaches have been developed for example chemical delivery system, magnetic drug targeting, drug Carrier system (antibodies, liposomes or nanoparticles).

PA-75: Formulation and characterization of mucoadhesive nanoemulsion drug delivery system of lorazepam for status epilepticus

SINGH MANISH K*, BAJPAI ANSHITA, DATT NEELAM, SARAF SHAILENDRA K

FACULTY OF PHARMACY, BABU BANARASI DAS NORTHERN INDIA INSTITUTE OF TECHNOLOGY, LUCKNOW-226028, U.P.

Email: mk4732@yahoo.in

Status epilepticus is a seizure of sufficient duration lasting more than 30 minutes. Lorazepam is a first line benzodiazepine act by enhancing the action of Gamma-aminobutyric acid for status epilepticus. The present

experimental work aimed to develop advanced nanoparticle system based mucoadhesive intranasal nanoemulsion of Lorazepam for the treatment of Status Epilepticus. Nine formulations (A to I) were prepared using spontaneous emulsification method. The above formulations were evaluated for drug content, viscosity, refractive index, bioadhesiveness, % drug release, entrapment efficiency, zeta analysis and in-vivo activity using electroshock model. The prepared mucoadhesive nanoemulsion of Lorazepam was clear and transparent with particle size 11.4 nm which is in nanometric range, with pH 6.8. The viscosity of optimized batch E was found to be 46.25 cP. The formulation has low viscosity which makes it pourable for nasal administration. The drug content was found to be 18 mg. The % drug release and % entrapment efficiency were found to be 68.5 % and 70.50 % respectively. It was concluded that a novel, fast, accurate and convenient technique was utilized for the formulation of nanoemulsion and intranasal drug delivery system provide low side effects and exhibit faster and prolong release of drug during the treatment of status epilepticus.

PA-76: Formulation and evaluation of solubility enhanced ciprofloxacin

BANO AFZAL*, PATRA SAGARIKA

COLLEGE OF PHARMACEUTICAL SCIENCES MOHUDA, BRAHMAPUR-760002, ODISHA

Email: afzalbano122017@gmail.com

The main objective of present research work has to formulate microemulsion of ciprofloxacin, a poorly water soluble antimicrobial drug having low bioavailability. Hence its salt form is commercially used which enhance

the solubility in water. For this present work, initially surfactant, cosurfactant were selected according to their HLB value. The pseudo-ternary phase diagram is constructed to determine the microemulsion existing zone. Six different types of formulations were developed by a homogeniser with 70-80 rpm at 40-60 degree celcius. Then all the formulations were evaluated for pH conductivity, in-vitro drug release study, stability study, solubility study was performed for optimized formulation. The ph of designed formulations were between the range of 6.04-7.0. This is ideal for blood because the pH of the blood is 7.3-7.4. Oil in water type of microemulsion was determined by the conductivity data. In-vitro release of optimized formulation (FM3) was 96.2% as compared to pure drug 46.60%. After 90 minutes and the marketed product i.e salt form is 94%. Hence by formulating microemulsion, solubility of ciprofloxacin is significantly enhanced and safety for use.

PA-77: Fabrication of surface decorated graphene oxide nanocomposite for label free prognosis of Alzheimer's disease

NANGARE S. N*, DESHMUKH P. K., TADE R. S

HR PATEL INSTITUTE OF P'CEUTICAL EDUCATION AND RESEARCH, SHIRPUR, MAHARASHTRA -425405

E-mail: rxpatilpravin@yahoo.co.in

Alzheimer's disease (AD) is a major neurodegenerative health problem worldwide. Since, the poor prognosis of the disease significantly contributes to its complicated

nature. The recent techniques engaged in the AD biomarker detection are costly, tedious, and time-consuming, necessitate complicated instruments and lack sensitivity. Therefore, using the currently proposed Surface Plasmon resonance (SPR) biosensor, we will be able to develop simplistic sensor with adequate sensitivity to achieve detection of AD biomarkers (A β , tau protein, and β -secretase), in range of nM to pM. Looking at synthesis prospects, AgNPs and GO were prepared by green route and the modified Hummers method respectively and analyzed for spectral techniques. Spectroscopic findings explored the successful synthesis of GO and AgNPs. Results revealed the appreciable particle size, zeta potential, PDI, EDAX of AgNPs and GO. HR-TEM revealed the spherical nature of AgNPs around 14.36 to 21.80 nm size and polycrystalline property. Also, the layer-by-layer (LbL) technique was efficiently used for the fabrication of GO@MNP-Ab. The zeta potential for LbL approach exhibited the successful deposition of cationic and anionic polymers. Finally, the GO@MNP-Ab sensor showed the efficient detection of AD biomarkers using SPR. This LbL GO@MNP-Ab biosensor will open up new avenues for real time, cost effective and easy detection of AD.

PA-78: Recent advances in novel drug delivery system

THAKUR MONIKA*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, SECTOR 3A, BHADURGARH, HARYANA-124507

E-mail: tmonika783@gmail.com

An overview to target knowledge about recent advances in NDDS. This data for the report is gathered from pubmed, research gate,

elsewhere, science direct and science daily. Evolution of an existing drug molecules from a conventional form to a novel form can significantly improve its performance in terms of patient compliance, safety and efficacy. This Study highlights the vesicular system such as liposomes, niosomes, ethosomes, transferosomes and pharmacosomes are used to improve the therapeutic index of drug. Particulate system like nanoparticles have been used as a physical approach to alter and improve pharmacokinetic and pharmacodynamic properties of various types of drug molecules due to their small sizes, they exhibit properties like enhanced reactive area as well as ability to cross cell and tissue barrier, that make them a favourable carrier for a novel drug delivery. It also highlights the many challenges associated with anti-hypertensive drug therapy currently available antihypertensive drugs bears some significant drawbacks but efforts have been made to design drug delivery system for antihypertensive drugs- a) reduce the dosing frequency b) increase in bioavailability c) deliver them to target cell with minimal side effects. This present review highlight the better therapy for high standard of living.

Keywords:- Carriers, Hypertension, nanoparticles, vesicular, liposomes

PA-79: Formulation and evaluation of liposomal formulation for an antidiabetic drug

HARISH KOTHARI*, YASH SHARMA, SWARNA RAJ, BHAVNA

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN-248009

E-mail: hkothari917@gmail.com

Liposomes are the spherical vesicles having at least one lipid bilayer. The use of liposome can be as a vehicle for the administration of pharmaceutical drugs and nutraceuticals. In the present research oral antidiabetic drug (Sitagliptin) was used for the preparation of liposomal delivery. The method of preparation for liposome formation was hand shake method, by using materials as lecithin, cholesterol, chloroform, methanol, polyethylene glycol and palm oil. The liposomal formulations were evaluated for various physicochemical properties and in vitro drug release studies. The prepared liposomes were evaluated for visual appearance, liposome size by optical microscopy, pH determination, % drug entrapment efficiency and % drug loading capacity. Efforts were made to study the in-vitro release studies for optimized liposomal formulation (LHS-1) of Sitagliptin which follows first-order release kinetics. Liposomes being a leading drug delivery system, played a significant role in the formulation of antidiabetic drugs, thus can improve the therapeutic effect.

Keyword: Liposomes, Hand shake method, Drug entrapment, Drug loading, oral antidiabetic

PA-80: Antimicrobial Potential Herbal Derived Oil

MEGHA*, FARHEEN, SHARAD VISHT, HARISH CHANDRA

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN, UTTARAKHAND-248009

E-mail: gmeghan043@gmail.com

The volatile oils are the one the phytochemicals that are used since ancient time due to their therapeutic activity like antibacterial, antifungal, permeation enhancer, anti-

inflammatory, analgesic etc. The purpose of study was to evaluate antimicrobial potential of oil obtained from Galinsoga Formosa. Oil was extracted using Clevenger apparatus. The antimicrobial assay was performed as per I.P. The plant was procured from road side at Nalapani, Dehra Doon in month of September. The plant was authenticated. The whole fresh plant was utilised for extraction of oil by Clevenger apparatus. After extraction the oil was characterized and evaluated for anti-microbial properties (antibacterial and antifungal activity). It was concluded from present study that oil showed antimicrobial activity but the antibacterial activity was more prominent than antifungal activity. Keywords: Galinsoga formosa, herb, oil, antibacterial, antifungal

PB-01: Evaluation of hepatoprotective activity of Ficus carica fruit extract

AWASTHI SANTOSH*, VILAS VANJARI ARCHANA, NANJAPPAIAH H M, PATIL V P, HUGAR SHIVKUMAR

BLDEA'S SSM COLLEGE OF PHARMACY & RESEARCH CENTRE, VIJAYAPUR-586103

Email: amoghsanth@gmail.com

The present study was an attempt to demonstrate the hepatoprotective potential of Petroleum ether extract of Ficus carica fruit against Isoniazid mediated rat liver injury. Hepatoprotective activity of test extract was evaluated by estimating the serum levels of SGPT, SGOT, ALP and Bilirubin (Total & Direct) against isoniazid induced liver toxicity in rats. In the present study, rats treated with petroleum ether extract of Ficus carica fruit exhibited dose dependant significant decrease

in the elevated levels of biochemical markers when compared to the isoniazid control group. The standard drug silymarin demonstrated significant hepatoprotective activity.

PB-02: Screening of antistress activity of Ficus benghalensis fruit extract

NANJAPPAIAH H M*, MD. ABDUL QAYYUM, SHIVAKUMAR HUGAR, PATIL VP

P.G. DEPT OF PHARMACOLOGY, BLDEA'S SSM COLLEGE OF PHARMACY & RESEARCH CENTRE, VIJAYAPUR, KARNATAKA,-586103, INDIA,

Email: nanjupharma143@gmail.com

The aim of the present study was to investigate the antistress activity of Ficus benghalensis fruit (Moraceae) using albino mice and rats. The methanolic extract of Ficus benghalensis fruit was prepared and subjected to preliminary qualitative phytochemical screening. Flavonoids, Tannins and Alkaloids were found to be present. Acute toxicity studies were carried out in albino mice. The methanolic extract did not show the lethal effect at a dose of 2000 mg/kg body weight with no signs of abnormalities or any mortality observed for 14 days period. Anoxia stress tolerance test, Swimming endurance test, Immobilisation stress models were used to investigate the anti-stress potential of title plant. The results indicate that pretreatment with methanolic extract of fruit of Ficus benghalensis exhibited significant anti-stress activity at the tested doses of 125mg/ kg and 250 mg/ kg 500 mg/ kg. On the basis of results, it was concluded that Ficus benghalensis fruit possess anti-stress activity.

PB-03: Evaluation of hepatoprotective activity of Ficus carica fruits extract

HUGAR SHIVAKUMAR*,PATIL VIRUPANAGOUDA, VANJARI ARCHANA VILAS, H M NANJAPPAIAH,

P. G. DEPT. OF PHARMACOLOGY BLDEAS SSM COLLEGE OF PHARMACY AND RESEARCH CENTRE, BLDE UNIVERSITY CAMPUS, VIJAYAPUR-586103. KARNATAKA,

Email: shivkumarhugar@yahoo.com

The present study was an attempt to demonstrate the hepatoprotective potential of petroleum ether extract of Ficus carica fruits against isoniazid and alcohol mediated rat liver injury. Hepatoprotective activity of test extract was evaluated by estimating the serum levels of ALT, AST, ALP and bilirubin (total & direct) using isoniazid induced liver toxicity and ethanol induced hepatic injury in rats. In the present study, rats treated with the petroleum ether extract of Ficus carica fruits demonstrated dose dependant significant decrease in the elevated levels of biochemical markers when compared to the isoniazid and ethanol induced liver toxicity. The results of the present study suggest that petroleum ether extract of Ficus carica fruits possesses significant hepatoprotective efficacy against isoniazid and alcohol exposed liver toxicity.

PB-04: Anthelmintic activity on leaves and bark extract of Bauhinia variegata Linn.

PANT MEGHA*

SCHOOL OF PHARMACY, GRAPHIC ERA HILL UNIVERSITY, CLEMENTOWN, DEHRADUN,UK,

248001

Email: pant.megha.1999@gmail.com

The aim of the present study was to evaluate the anthelmintic activity of ethanolic and aqueous extract of leaves and bark of *Bauhinia variegata* Linn using *Pheretima posthuma* as test worms. The time of paralysis and time of death were studied and the activity was compared with piperazine citrate as reference standard. The alcohol and aqueous extract of bark of *Bauhinia variegata* exhibited significant anthelmintic activity as evidenced by decreased paralyzing time and death time. The results thus support the use of *Bauhinia variegata* as an anthelmintic agent.

*PB-05: Antiuro lithiatic activity of *Phyllanthus acidus* aqueous leaf extract*

MOBEEN SHAIK*, KALYANI V, PADMALATHA K, VENKATESARA RAO, S, JAYARAMI REDDY A

VIJAYA INSTITUTE OF PHARMACEUTICAL SCIENCES, ENIKEPADU, VIJAYAWADA, ANDHRA PRADESH, 521108

Email: mobeen.pharma@gmail.com

The present study was an attempt to scientifically validate the folkloric usage of *Phyllanthus acidus* aqueous leaf extract for the said ailments. The In-vitro results of calcium oxalate crystallization showed high antiuro lithiatic activity, protein denaturation method showed high antiarthritic activity, poor hemolytic activity and high thrombolytic activity. Supplementation with aqueous leaf extract of *Phyllanthus acidus* in Sprague dawley rats with urolithiasis significantly ($P < 0.001$) lowered kidney retention levels of calcium and magnesium. Furthermore, high serum levels of

urea, blood urea nitrogen, creatinine and uric acid were significantly ($P < 0.001$) reduced by the extract. The extract exhibited significant antiuro lithiatic activity at dose of 500 mg/kg body weight as evidenced by histopathology studies. The obtained results provide a support for the use of this plant in traditional medicine and in further investigation.

*PB-06: Salubrious anthelmintic potential on leaves extract of *Shorea robusta* Linn.*

ADITI PETWAL*

SCHOOL OF PHARMACY, GRAPHIC ERA HILL UNIVERSITY, CLEMENTOWN, DEHRADUN, UK, 248001

Email: petwaladiti@gmail.com

The plan of the study was to assess the potential of anthelmintic activity of ethanol and chloroform extract of leaves of *Shorea robusta* Linn using *Pheretima posthuma* as test worms. The time of paralysis and time of death were studied and the activity was compared with piperazine citrate as reference standard. The ethanolic and chloroform extract of leaves of *Shorea robusta* exhibited significant anthelmintic activity as proof by decreased paralyzing time and death time of the test worms. However, chloroform extracts show good result as compare to ethanol extract. The results hence support the use of *Shorea robusta* leaves extract as an anthelmintic agent.

PB-07: β -caryophyllene, a CB2R selective agonist, protects against dementia

induced by neuro-inflammation but not by mitochondrial dysfunction

KISHORE A*, KANOJIA U, CHATURBHUI SG, SANKE RA, DAS M, SURUBHOTLA R, KRISHNADAS N, GOURISHETTI K, NAYAK PG.

MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES, MANIPAL ACADEMY OF HIGHER EDUCATION, MANIPAL, KARNATAKA, INDIA, 576104

Email: anoop.kishore@manipal.edu

In the present study, we evaluated the effects of β -caryophyllene (BCP), a cannabinoid receptor-2 selective agonist, against dementia models whose aetiology mimicked neuroinflammation and ageing. Two doses of β -caryophyllene (50 & 100 mg/kg, p.o.) were tested against AlCl₃-induced dementia in rats using Morris water maze test. In this model, dementia was induced by injecting AlCl₃ intraperitoneally at 10 mg/kg once daily for 42 days and the animals were treated with BCP for 21 days. Spatial memory was evaluated by escape latency and path efficiency. Then, episodic memory was assessed using novel object recognition task in doxorubicin-induced (DOX) neuroinflammation model, where DOX at 2.5mg/kg was given intraperitoneally once every 5 days for 50 days, with BCP co-administration. Later, its effect on spatial memory was evaluated in the ageing model of D-galactose-induced mitochondrial dysfunction. For ageing, D-galactose was injected subcutaneously at 300 mg/kg for 70 days, with BCP co-administration. BCP at 100 mg/kg exhibited significant activity against AlCl₃- and DOX-induced cognitive impairment and improved the diminished



activities of AChE, catalase and SOD in the hippocampus and reduced the levels of lipid peroxidation. However, it did not show activity against D-galactose-induced ageing model. BCP protects against dementia induced by neuroinflammation. However, it has no effect on neuronal ageing induced by mitochondrial dysfunction.

PB-08: Neuroprotective effect of trans-cinnamaldehyde in rotenone induced neurotoxicity in rats; possible role of nitric oxide

KUMAR S*, KUMAR S, KUMAR P

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, BATHINDA-151001.

Email: sachinpadruthiya@gmail.com

This study aimed to investigate the potential beneficial effects of trans-cinnamaldehyde (TCA) in Rotenone induced Neurotoxicity in Rats. trans-cinnamaldehyde expected to improve Parkinsonism like symptoms by modulating the levels of various neurotransmitters. The neuroprotective role of TCA is well explored in various CNS disorders. Therefore, this study was designed to explore and compare the mechanistic role of TCA against rotenone induced Parkinsonism like symptoms in rats. Rats were administered with rotenone (1.5 mg/kg/day; s.c.) daily for a period of 35 days. TCA (5, 10 and 20 mg/kg) were administered daily starting from 1st day one hour prior to rotenone administration. TCA (5, 10 and 20 mg/kg) were administered daily starting from 1st day one hour prior

to rotenone administration. Behavioral parameters (body weight, rotarod, narrow beam walk and actophotometer) were assessed on weekly basis. On 35th day, animals were sacrificed and striatum were isolated for biochemical (LPO, GSH and nitrite). Rotenone administration significantly reduced body weight, motor coordination, oxidative defense, increased pro-inflammatory mediators and decreased level of catecholamines. Pre-treatment with TCA significantly attenuated the alteration in behavioral, oxidative stress, neuroinflammatory, mitochondrial and catecholamines level in striatum. The study provides a hope that these drugs could be used as adjuvant therapy in the management and treatment of PD.

PB-09: Neuroprotective effect of filgrastim against haloperidol induced orofacial dyskinesia in rats

KADIR A*, RAM P, KUMAR P

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, DABWALI ROAD, BATHINDA, PUNJAB-151001, INDIA

Email: kadircare@gmail.com

Tardive dyskinesia is an iatrogenic, inevitable, hyperkinetic movement disorder characterized by choreiform, ataxic and repetitive involuntary movements involving the mouth, face and trunk. The oxidative stress hypothesis is one of the possible mechanisms involved in the TD. The study was designed to investigate the neuroprotective effect of filgrastim against haloperidol induced orofacial dyskinesia possibly by modulating the behavioral and

oxidative stress parameters in rats. Rats were treated with haloperidol (1 mg/ kg, i.p. for 21 days) to induce orofacial dyskinesia. Filgrastim (20, 40 and 60 µg/ kg, s.c.) was administered daily 4 hours before the haloperidol treatment for 21 days. Behavioral parameters were assessed on 1st, 7th, 14th, 21st day after haloperidol treatment. On day 22nd animals were sacrificed, striatum and cortex were separated out for the estimation of biochemical parameters. Administration of haloperidol for 21 days results in decreased rotarod and locomotor activity and increasing the orofacial dyskinetic movements. Further, haloperidol treatment results in increased levels of MDA, nitrite and decreasing levels of antioxidant enzymes. The administration of filgrastim (40 and 60 µg/ kg, s.c.) along with haloperidol significantly attenuate the impairment in behavior and biochemical parameters. However, the lower dose of filgrastim (20 µg/ kg, s.c.) shows no significant effect.

PB-10: Neuroprotective effect of berberine against 3-nitropropionic acid induced huntington disease like symptoms in rats

RAHI V*, BRAD JS, KUMAR P

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, DABWALI ROAD, BATHINDA, PUNJAB-151001, INDIA

Email: vikrantrahi100@gmail.com

Huntington's disease (HD) is a disorder of hyperkinetic movement and progressive neurodegeneration which causes motor dysfunction. We investigated Berberine (BBR),

a plant alkaloid, for its curing abilities if any in 3-nitropropionic acid (3-NP)-induced HD in rats. BBR was administered orally at three different doses, half an hour prior to the administration of 3-NP (10mg/kg i.p) for 21 days. Performance of rats on narrow beam walk (NBW), rotarod and actophotometer were investigated on the 1st day, 7th day, 14th day and 21st day along with calculation of percentage change in body weight. Levels of superoxide dismutase (SOD), catalase, lipid peroxidation (LPO), glutathione (GSH) and nitrite were calculated in the tissue homogenates of striatum and cortex differently. Histological investigation was also performed to determine cell death. BBR 50mg/kg/ga p.o and 100 mg/kg/day p.o has significant results on enhancement of locomotor, rotarod and NBW also increase the levels of antioxidants. BBR 25 mg/kg/day p.o has non-significant results and decrease the level of nitrite. BBR 100 mg/kg/day p.o has significant results over 50 mg/kg/day p.o. BBR failed to affect 3-NP-induced striatal neuronal lesion but decreased microglial proliferation and increased astrocyte numbers in the lesion core are seen. These results taken together suggest that BBR could be potential not only use for correcting movement disturbances and anxiety in HD but also for reducing excitotoxicity.

PB-11: Neuroprotective potential of fingolimod in experimental sporadic dementia in rats.

KAJAL*, PRIYANKA, DESHMUKH R

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, DABWALI ROAD, BATHINDA,

PUNJAB-151001, INDIA

Email: kajalbagri1796@gmail.com

Alzheimer's disease (AD) is an age-related neurodegenerative disease mainly characterized by progressive cognitive decline, synaptic loss, extracellular amyloid-beta ($A\beta$) deposits and intracellular accumulation of neurofibrillary tangles of tau protein. Multiple etiological factors have been linked with AD pathophysiology, oxidative stress, neuroinflammation, neurotransmitter deficit and foremost are the deregulation of lipid metabolism, involve in AD pathology and cognitive deficit. In the present study we have explored the neuroprotective potential of Fingolimod (FTY720), against ICV-STZ induced experimental sporadic dementia in the rats. STZ infused bilaterally at the dose of (3mg/kg) on day first and third. Spatial and non-spatial memory was evaluated by using Morris water maze and object recognition test. Fingolimod (0.25 and 0.5 mg/kg, p.o.) was administered at weekly intervals after ICV-STZ infusion in rats. STZ infusion in rats produced cognitive deficit and caused significant elevation in markers and oxidative stress and degenerative changes in hippocampus and cortical brain region. Fingolimod treatment attenuate STZ-induced cognitive decline, reduced oxidative burden and able to preserve neuronal architecture and prevent neuronal loss in hippocampus and cortical brain region of the rats. The outcome of the present study clearly indicates that the neuroprotective potential of fingolimod & suggesting its therapeutic potential in cognitive disorders.

PB-12: The assessment of possible role of β 2-adrenergic transmission in Alzheimer's

disease in biventricular streptozotocin

KUMARI S*, SINGH VP, DESHMUKH R

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, BATHINDA, PUNJAB, 151001, INDIA

Email: thakurshilpa156@gmail.com

Multiple neurotransmitter deficits have been observed during aging and associated disorders such as sporadic alzheimer's disease. Deficit in central noradrenergic transmission has been well documented in AD and aging pathophysiology. However, β 2-adrenergic signaling has been reported to play a key role in neurogenesis, synaptic plasticity and depletion of neuroinflammatory markers in brain. However, the exact role of β 2-adrenergic modulation (stimulation inhibition) was a matter of debate, although in the present study it has been found that β 2-adrenergic agonist clenbuterol enhance the cognitive functioning as well as restores the cholinergic hypofunction, antioxidant level in brain. Moreover, outcomes of present study clearly indicate that the stimulation of β 2-adrenergic receptor would be therapeutic in management of progressive cognitive disorders such as sporadic Alzheimer's disease.

PB-13: Embelin restores striatal seurochemistry and attenuates MPTP-induced motor deficits in rats

PURI P*, BHARDWAJ R, DESHMUKH R

DEPARTMENT OF PHARMACEUTICAL

SCIENCES AND TECHNOLOGY, MAHARAJA
RANJIT SINGH PUNJAB TECHNICAL
UNIVERSITY, BATHINDA, PUNJAB, 151001,
INDIA

Email: priyankajmi1997@gmail.com

Embelin, a main active constituent of Embeliaribes, has been reported to possess various neuroprotective potential and reported to produce anti-inflammatory, antioxidant and anticonvulsant action. In the current study we have investigated the neuroprotective potential of embelin against MPTP induces experimental Parkinson's disease in rats. MPTP was administered on 1st, 4th and 7th day in rats. Embelin was administered from day 2nd to 15th in MPTP infused rats. Movement abnormalities were assessed by behavioural tests and change in body weight was examined on weekly basis. On the 15th day, the animals were sacrificed, and the rat striatum was isolated for the estimation of biochemical parameters, pro-inflammatory cytokine levels, monoamines and their metabolites, GABA and glutamate was performed. Repeated intranigral administration of MPTP significantly altered the behavioural, biochemical, proinflammatory cytokines and striatal neurochemistry. Further, embelin attenuated oxidative stress, pro-inflammatory cytokines and restored the striatal neurochemistry induced by MPTP. These findings suggest the neuroprotective effect of embelin against PD. The observed protective effect of embelin might be attributed to its antioxidant, anti-inflammatory and neuromodulatory effects.

*PB-14: Vinpocetine
attenuates levodopa induced
dyskinesia and biochemical
abnormalities in striatal 6-*

OHDA infused rats

SHARMA G*, SHARMA S, DESHMUKH R

DEPARTMENT OF PHARMACEUTICAL
SCIENCES AND TECHNOLOGY, MAHARAJA
RANJIT SINGH PUNJAB TECHNICAL
UNIVERSITY, BATHINDA, PUNJAB, 151001.

Email: garusharma189@gmail.com

Parkinson's disease (PD) is the second most common neurodegenerative disorder. However, chronic use of L-DOPA is associated with dyskinesia in PD patients. Increased level of oxidative stress markers along with neuroinflammation has been well reported in animal models as well as in human PD patients. Vinpocetine is a well-known antioxidant and anti-inflammatory agent along with phosphodiesterase -1 inhibitory activities. Recently it has been reported to reduce neuronal death in various in-vitro and in-vivo animal model of PD. In the present study we have investigated the effect of vinpocetine on LIDs in 6-hydroxydopamine (6-OHDA) lesioned rats. Intra-striatal administration of 6-OHDA followed by treatment with L-DOPA and carbidopa produced stable motor deficits, dyskinesias and cause increased oxidative stress and neuroinflammatory markers. Chronic treatment with vinpocetine significantly attenuated dyskinesias along with in 6-OHDA treated rats. The current data demonstrate that vinpocetine could prove to be a useful candidate molecule for the treatment of movement disorders as well as in the management of LID.

*PB-15: Evaluation Of
Neuroprotective Effect Of
Stevoside On Experimental
3-Nitropropionic Acid*

Induced Huntington's Disease

ROHIT*, DAHALIA M, NAJIBULLAH MD,
PATHAK DP, LATHA S*

DELHI INSTITUTE OF PHARMACEUTICAL
SCIENCE AND RESEARCH (DIPSAR),
MEHRAULI, NEW DELHI- 110017

E-mail: rcpharma74@gmail.com

Huntington's disease is a rapidly progressive neurodegenerative disease that leads to dementia. Typically presents with alterations in mood defects in memory and attention progresses to a movement disorder consisting of involuntary rapid motions. The 3-Nitropropionic acid (3-NP) a natural environmental toxin selectively causes the degeneration of GABAergic neurons in the striatum by inhibiting mitochondrial complex -2, leading to neuronal death that producing huntington like symptoms. There are currently no effective pharmacological agents available to treat core symptoms. To study the neuroprotective action of stevoside of physiological, neurobehavioral and biochemical parameters and evaluation the effect of stevoside on 3-Nitropropionic acid induced neuronal death in cortex, hippocampus and striatum using H&E STAINING. The finding of our study showed that the stevoside significantly improved the learning, memory and motor functions in the 3-NP induced HD in rats by decreasing the acetylcholine esterase activity which in turn increased the cholinergic neurotransmission in the striatum, cortex, and hippocampus. It shows antioxidant and scavenging properties.

*PB-16: Evaluation of
Neuroprotective Effect of
Garcinol on LPS Induced*

Neuroinflammation

WALIA HIMANSHI*, CHAUHAN ROHIT,
RAY RS, LATHA S

DELHI INSTITUTE OF PHARMACEUTICAL
SCIENCE AND RESEARCH (DIPSAR),
MEHRAULI, NEW DELHI- 110017

Email: mishu26296@gmail.com

Neuroinflammation is the pathological hallmark of various neurodegenerative disorders and other psychiatric illness including Alzheimer's disease, Parkinson's disease, Huntington's disease and Multiple sclerosis. Bacterial endotoxin lipopolysaccharide (LPS) is a well accepted model for the induction of neuroinflammation in rodents with microglial activation and elevation of brain inflammatory cytokines. Garcinol, a polyisoprenylated benzophenone is the principle antioxidant substance occurring in *Garcinia cambogia*. It shows strong antioxidant activity. It shows potent antiinflammatory, antioxidant and anticholinesterase properties. Hence we investigated the neuroprotective potential of garcinol against LPS induced neuroinflammation in rats.

PB-17: Thyroxine activity of Phyllanthin & Hypophyllanthin on Female & Male Wistar Rats

BANO AYESHA*, KUMAR AKSHAY,
KUMAR TANYA, AGRAWAL SS

DELHI INSTITUTE OF PHARMACEUTICAL
SCIENCE AND RESEARCH (DIPSAR),
MEHRAULI, NEW DELHI- 110017

Email: officialab1993@gmail.com

The thyroid gland is a butterfly-shaped

endocrine gland located in the base of the neck. It releases two major hormones T₃ (triiodothyronine) and T₄ (tetraiodothyronine). Hypothyroidism is the disease state in humans and animals caused by insufficient production of thyroid hormone. Hypothyroidism is treated with the laevorotatory form of thyroxine (L-T₄) and triiodothyronine (L-T₃). But they may cause various side effects and may also be economically costly. Herbal drugs have been used since ancient time for curing various diseases. One such plant is *Phyllanthus amarus*, it is used as an hepatoprotective. Since, the liver metabolises the thyroid hormones T₃ and T₄; therefore, in a liver disorder the serum concentrations of both the thyroid hormones may be affected. Encouraging results were obtained when isolated compounds of *Phyllanthus amarus* viz., Phyllanthin and Hypophyllanthin showed thyroid activity quantified by inducing hypothyroidism in rats using chemical agents like Propylthiouracil. Various parameters such as Total protein, total cholesterol, T₃ and T₄, TSH, daily food and water intake, histopathological parameters, reproductive hormones, weekly body weight, thyroid weight were estimated.

PB-18: Pharmacological Investigation of Agmatine in Polycystic Ovarian Syndrome in Rats

WANJARI MINAKSHI S*, AGLAWE MM,
DIXIT MP, TAKSANDE BG, KOTAGALE NR

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTÉE, NAGPUR,
MAHARASHTRA-441002

Email: wanjariminakshi25@gmail.com

Present investigation focuses on

pharmacological investigation of agmatine in polycystic ovarian syndrome in rats. Female rats were taken and assigned to oral administration of Letrozole (1 mg/kg) dissolved in 0.5% CMC (2mg/kg) up to 21 days for induction of PCOS in rats. PCOS rats will be administered with Agmatine (40 mg/kg ip) for 15 days and various biochemical estimations will be done. During this period, vaginal smears were collected daily for estrus cycle determination. On the day subsequent to last Letrozole dose administration, rats were killed; uteri and ovaries were then excised and weighed. Serum hormone levels and histologic changes in ovaries were examined. Results of our study profoundly display the beneficial role of agmatine in regulating metabolism in PCOS. Agmatine 40 mg/kg ip have significantly attenuated the metabolic impairment induced by Letrozole again indicated through normalized serum total cholesterol, triglyceride, HDL, LDL and blood glucose levels in PCOS rats. Concluding our work, present study demonstrates anti hyperglycemic effects of agmatine and its protective properties. The restoration of ovarian function and hormonal profile by agmatine treatment could be supportive in managing PCOS. This is not a fully convincing model for the study of polycystic ovaries or of polycystic ovary syndrome (PCOS). As a whole, this animal model in several ways is similar to the human polycystic ovary syndrome.

PB-19: Involvement of Imidazoline Receptor in Antidepressant like Effect of Metformin in Rats

IKHAR ABHILASHA PREMLAL*,
RAMTEKE US, GAWANDE DY, TAKSANDE

BG, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTTEE, NAGPUR,
MAHARASHTRA-441002

Email: abhikhar65@gmail.com

Aim of present study was to investigate the involvement of imidazoline receptor in antidepressant like effect of metformin in rats. Sprague dawley rats (220-250 g) are used for this protocol. the rats in which depression was induced by Force Swim Test (FST) after 24hr, metformin (25mg/kg, 50mg/kg, 100mg/kg, i.p.) was administered for treatment. The sub-effective dose of imidazoline I1 receptor agonist moxonidine (0.25 mg/kg), imidazoline I1 antagonist efaroxan (1.0mg/kg) and imidazoline I2 idazoxan (0.25mg/kg) were administered prior to metformin and agmatine and check the antidepressant like effect of agmatine by forced swim test and open field test through interaction with imidazoline receptor. The results were found significantly effective in decreasing immobility time showing antidepressant like effect in depressed rats. The imidazoline I1 receptor agonist moxonidine (0.25 mg/kg) found to potentiate mobility time of metformin (25mg/kg). In contrast, imidazoline I1 antagonist efaroxan (1.0mg/kg) and imidazoline I2 idazoxan (0.25mg/kg) found to attenuate anti-depressant like effect of metformin (25mg/kg). Agmatine (20mg/kg) and metformin (25mg/kg) produce synergistic effect. The present study we propose that metformin is closely associated with agmatine and imidazoline receptors. Thus, as like agmatine, metformin can be also projected as a novel therapeutic target for treatment of depression.

PB-20: Role of Achyranthes Aspera Linn. Root Extract on

Pentylentetrazole induced Kindling and Associated Comorbidities

PISE SHAILESH BABURAO*, SAKHARE DIVYA, GAWANDE D, AGLAWE M, TAKSANDE BG, UMEKAR MJ.

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTTEE, NAGPUR,
MAHARASHTRA-441002

Email: shailesh.pise04@gmail.com

Aim of present study was to find out the the role of Achyranthes aspera root extract in comprehensive management of epilepsy and associated comorbidities. Kindling was induced in animals by PTZ (35 mg/kg; i.p.) for 42 days. After kindling animal were divided in different treatment groups. The naïve group (non-kindled) was considered as Group I (n=6) and was injected daily with saline (10ml/kg; i.p.). Group II (n=5) served as the vehicle control, Group III (n=5) served as the sodium valproate treatment group (300mg/kg; i.p.) and Group IV-VI (n=5) served as the A. aspera (1, 2.5 and 5mg/kg; i.p.). On every 5th day post-treatment, Group II-VI were challenge with a PTZ (35mg/kg; i.p.) and the seizure severity score was noted. Animal were monitored for the seizure severity score up to 1h (immediately after the PTZ shot). 2h after the PTZ animal were subjected to behavioral evaluations. The result of the present study suggests that A. aspera treatment has ameliorative effect on seizure severity; depression like effect and learning and memory deficit in PTZ kindled mice. The present study concludes that Achyranthes aspera Linn. May be given per se or supplemented with standard antiepileptic drug for the management of epilepsy and associated comorbidities.

PB-21: Role of Achyranthes Aspera Linn. in Chronic Unpredictable Mild Stress induced Depression in Mice.

BHAD MRUNALINI NITIN*, BAREWAR SN, GAWANDE DY, TAKSANDE B.G, KALE MB, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTTEE, NAGPUR,
MAHARASHTRA-441002

Email: mrunalinibhad05@gmail.com

Antidepressant activity of Achyranthes aspera was studied in CUMS induced depression. Swiss albino mice were exposed to chronic unpredictable mild stress (CUMS) protocol for 28 days and evaluated in sucrose preference test, splash test, forced swim test as a parameters of depressive illness. Achyranthes aspera and fluoxetine were injected during day-15 to day 28 of the protocol. The present study showed that mice stressor regimen induced significant reduction in sucrose preference test, grooming behaviour in splash test, increase immobility in forced swim test as compared to non-stressed mice. Long term treatment of Achyranthes aspera significantly suppress anhedonia induced by CUMS protocol suggested the potential antidepressant like effect of Achyranthes aspera. Anti-depressant like effect was compared to SSRI's like fluoxetine. Achyranthes aspera and fluoxetine treatment shown to prevent the effect of CUMS on splash test and Achyranthes aspera elicit antidepressant like effect. The present study demonstrated anti-depressant like effect of Achyranthes aspera in CUMS induced depression in mice and Achyranthes aspera may represent a new potential approach for the

treatment of stress related neurological disease like depression.

PB-22: Evaluation of Efficacy of Local Drug Delivery of Achyranthes aspera Gel for Dental and Oral care

PATIDAR PRAGYA*, D'CRUZ T, PANDA VS, DIXIT MB, PRABHAKAR G

PRINCIPAL K.M. KUNDNANI COLLEGE OF PHARMACY, CUFFE PARADE, MUMBAI, MAHARASHTRA-400005

Email: patidar.pragyachinu@gmail.com

Aim of present study was to conduct a single blind case controlled trial to evaluate and compare the efficacy of A. aspera gel and tetracycline fibres in the management of chronic periodontitis in patients. Formulation was prepared by dispersing standardised aqueous extract of A. aspera in an aqueous based gel and then evaluated for various parameters like Viscosity, Texture, pH, Syringeability along with in vitro permeability and Stability studies. A clinical investigation of gel was conducted for which a total of 40 patients with chronic periodontitis were selected and categorized into two groups, Group A: 20 patients treated with scaling and root planing (SRP) followed by subgingival placement of A. aspera gel and Group B: 20 patients treated with SRP followed by subgingival placement of tetracycline fibre. The clinical parameters (Plaque Index, Gingival Index, Probing Pocket Depth, and Clinical Attachment Level) were recorded at baseline and at the follow-up done after 3 months. Results showed that the formulation was stable up to one month and from clinical evaluation it was inferred that it causes significant reduction of all the parameters. A.

aspera gel was comparable to that of marketed tetracycline fibres in the treatment of chronic periodontitis. Thus, the herbal gel is a safe alternative to Tetracycline.

PB-23: Studies on Role of Agmatine in Ethanol Withdrawal induced Depression in Rats

KAPSE MONA SUBHASH*, PATIL SD, TAKSANDE BG, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTTEE, NAGPUR, MAHARASHTRA- 441002

Email: monakapse1@gmail.com

Aim of present study was to Study the role of agmatine in ethanol withdrawal induced depression in rats. Adult Wistar rats were administered with ethanol (2 g/kg, 12% v/v) by intraperitoneal route (ip) for 10 days. After 10 days of administration, ethanol withdrawal for 48 hours and animals were exposed to FST and thigmotaxis. During the withdrawal, agmatine was injected (10-40 mg/kg, ip) divided doses during 09:00 am and 05:00 pm daily. Agmatine (20 and 40 mg/kg, ip) significantly reduced the depression like symptoms induced by ethanol withdrawal. The pre-treatment with moxonidine (0.25 mg/kg, ip) 11 imidazoline receptor agonist potentiated; whereas the pre-treatment of Efaroxan (1 mg/kg, ip), an 11 imidazoline receptor antagonist efficiently reversed the effect of agmatine in ethanol withdrawal. The ELISA analysis of Arginine decarboxylase in hippocampus in ethanol withdrawn animal revealed that there was marked reduction in Arginine decarboxylase activity as compared normal animals. Agmatine can be projected as potential therapeutic target in overcoming

alcohol abuse and associated problem such as depression.

PB-24: Investigation on Agmatinerbic Signalling with in Habenula on Ethanol Self-Administration in Rats.

GAIDHANE VIJAYA J*, AGRAWAL RB, TAKSANDE BG, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTTEE, NAGPUR, MAHARASHTRA- 441002

Email: vijayagaidhane94@gmail.com

Aim of present study was to investigate the role of agmatinerbic signaling within habenula on ethanol self-administration in rats. Adult healthy Sprague-Dawley rats (220-250g) were implanted with the cannulae targeted at the posterior ventral tegmental area (pVTA) and lateral habenular (LHb) region due to their direct influence in ethanol reward. These rats were trained to self-administer ethanol in pVTA in a standard two-lever (active/inactive) operant chamber test. Each active lever press in self-administration of 100nL of ethanol (200 mg%) containing solution. Agmatine (40 and 80ng/rat) was injected into LHb during extinction phase before self-administration. Administration of agmatine (40 and 80 ng/rat) into LHb during extinction phase in pVTA produce decrease in lever presses in operant conditioning chamber. In addition, we analyzed the dopamine level in p-VTA region in trained and agmatine treated rats. Ethanol self-administration enhanced dopamine levels within pVTA and this effect was completely blocked by pretreatment of agmatine. The effect of agmatine was potentiated by α -2 agonist, clonidine (0.2mg/kg, i.p) and

blocked α -2 antagonist, yohimbine (2.5mg/kg, .ip). The study proposed the role of central agmatinerbic signaling within habenula in ethanol reinforcement mediated through α -2 receptor and suggests agmatine as a potential therapeutic target in alcoholism.

PB-25: Role of Achyranthes Aspera Linn. in Ethanol withdrawal Induced Anxiety and Depression

MUDE GAURAV SANJAYRAO*,
JAMBHULKAR JB, TAKSANDE BG,
UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTTEE, NAGPUR,
MAHARASHTRA- 441002

Email: gaurav21pharmamude@gmail.com

Aim of present study was to find out the role of Achyranthes aspera Linn root extract on ethanol withdrawal induced anxiety and depression by elevated plus maze, open field test and forced swim test. The plant material was ground to a moderately coarse powder. About 200g of the powder was extracted with alcohol and water using soxhlet apparatus. The phytochemical screening was carried out. The rats were tested for anxiety and depression like behavior in an elevated plus maze, open field test and forced swim test and evaluate the possible anxiolytic and antidepressant effects of A. aspera root extract during ethanol withdrawal. The results obtained from present work indicated that acute administration of A. aspera in withdrawal phase showed significantly decreased the ambulations and grooming in open field test in 10 min session which is increased in ethanol withdrawal where no significant difference was observed

in rearing But it is opposite in chronic administration. The administration of drug in ethanol withdrawal show significant decreased closed arm entries and time spent in elevated plus maze where there is increased open arm entries and time spent in elevated plus maze. The decreased immobility time was observed in acute drug administration which is increased in ethanol withdrawal group and opposite in chronic administration. The AARE is effective in treating ethanol withdrawal induced depression and somatic signs which fails to show anxiolytic effect.

PB-26: Investigation on the Role of Central Agmatinerbic Signaling in Ethanol Reinforcement in Rats

BHONDEKAR SHRADDHA P*, NAMBIAR
SB, AGLAWE MM, TAKSANDE BG,
KOTAGALE NR, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTTEE, NAGPUR,
MAHARASHTRA- 441002

Email: bhondekarshraddha@gmail.com

Investigation on the role of central agmatinerbic signaling in ethanol reinforcement in rats was studied. Sprague Dawley rats were implanted with the cannulae targeted at the posterior VTA. These rats were trained to self administer ethanol in standard two-lever operant chamber test and lever press resulted in self administration of 100nL of ethanol(200mg%) containing solution. Over a period of 7 days, ethanol significantly increased the number of lever presses, which was considered as a measure reward, while prior administration of agmatine, and its modulators aminoguanidine (65ng/rat), DFMO (125ng/rat), and arcaïne

(50ng/rat) into pVTA during extinction phase before self-administration subjection resulted in significant decrease in lever presses. Present study shows that the agmatine increases the lever pressing activities through imidazoline receptors. This indicates the significant inhibition of the action of agmatine and hence confirmed the involvement of imidazoline receptors in the effect of agmatine in blocking reacquisition. The present study for the first time investigated the role of central agmatinerbic signaling in ethanol reinforcement in rats and suggested agmatine as a potential therapeutic target in overcoming ethanol dependence.

PB-27: Involvement of Agmatine Pathway in Tolerance to Ethanol Analgesia and Withdrawal Hyperalgesia in Mice

BARAPATRE VAISHNAVI SURESH*,
CHARPE AS, NEWARE PR, TAKSANDE
BG, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTTEE, NAGPUR,
MAHARASHTRA- 441002

Email: vb.vaishu11@gmail.com

Aim of present study was to investigate that involvement of agmatine pathway in tolerance to ethanol analgesia and withdrawal hyperalgesia in mice. Adult healthy Swiss albino mice (25-28g) were injected with ethanol (3g/kg, ip, 12%) or saline (1ml/kg, ip) once daily for 9 days. On days 1, 3, 5, 7 and 9 of experiment, mice were subjected to the tail flick test 20min after the first daily ethanol injection. Agmatine (5-20 μ g/mouse, icv) or L-arginine (40 μ g/mouse, icv) or arcaïne (25 μ g/mouse, icv

) or CSF (2µl/mouse, icv) or aminoguanidine (20mg/kg, ip) or saline (1ml/kg, sc) was administered daily prior to first daily ethanol (1mg/kg,ip) or saline (1ml/kg, sc) injections and reaction latencies were determined as per above mentioned schedule. The tolerance to anti-nociceptive effect was observed on day 4 ethanol administration and continued up to end of the protocol. Injections of agmatine, arcaïne and aminoguanidine prevented the development of tolerance to ethanol analgesia and also inhibited withdrawal hyperalgesia in dependent animals. This study demonstrated that agmatine not only potentiate ethanol induced anti-nociception but also blocked its tolerance and withdrawal hyperalgesia. The data indirectly project agmatine as a potential therapeutic target in overcoming alcohol abuse and associated problem.

PB-28: Investigation on Role of Agmatine in Hypothalamic Regulation of Corticotropin Releasing Hormone Adrenocorticotropic Hormone Release and Associated Disorders

GAJBHIYE MONA D*, ZADE SP, TATODE AA, AGLAWE M, TAKSANDE BG, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTÉE, NAGPUR, MAHARASHTRA- 441002

Email: monagajbhiye@gmail.com

Investigation on the role of agmatine in hypothalamic regulation of corticotropin releasing hormone, adrenocorticotropic

hormone release and associated disorders was done in present study. Sprague Dawley rats (200-250 g) were administered with agmatine (10 nmole/rat i-pvn and 80 mg/kg i.p) and evaluated in open field test, elevated plus maize, forced swim test and plasma analysis of ACTH and corticosterone levels. Both agmatine doses, significantly increased number of entries and time spent in open arm with decreased number of entries and time spent in closed arm in EPM. However agmatine at similar doses, increased rearing, grooming and ambulation parameter in OFT and attenuated the immobility time in FST. Agmatine treated rat had markedly lower blood levels of CRH, ACTH and corticosterone as compared to OFT, EPM and FST subjected group. Present study demonstrated the role of agmatine in release of hypothalamic CRH followed by ACTH and corticosterone. Thus agmatine and agmatineric pathway may be suitable for management of neurobehavioural and neuroendocrine diseases.

PB-29: Advancement in treatment of Hutchinson-Gailford Progeria Syndrome

KAMBLE PRANALI SANJAY*, MAMIDWAR A, UMEKAR M, LOHIYA R

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTÉE, NAGPUR, MAHARASHTRA- 441002

Email: kpranali341@gmail.com

The aim of present study is to understand the various aspects of HGPS disease with special emphasis on pathophysiology, symptoms, recent trend in treatment and future opportunities. Clinical evaluation, study of laboratory tests like blood test, urine test, insulin resistance, cardiac stress testing, Genetic tests like detect

changing in the gene, skin changes similar to that in scleroderma. Lonafarnib, a FTL inhibitor, has been proposed as a form of treatment and recent studies have shown it is effective in alleviating some of the symptoms of progeria. So that it will help to reduce the risk of progeria. Progeria is devastating disease caused by a single gene mutation. Since the mutation is located on the LMNA gene, the nuclear Lamina proteins are affected. A single nucleotide substitution causes a 50 base pair deletion of pre-lamin A. Lamina A is then prevented from completing its processing and remains in an immature form called progeria. The accumulation of progeria has a multi-systemic effect leading to rapid aging and early from complications of atherosclerosis. Lonafarnib, a FTL inhibitor, has been proposed as a form of treatment and recent studies have shown it is effective in alleviating some of the symptoms of progeria. So it will help to reduce the risk of progeria.

PB-30: Effect of Achyranthes Aspera Linn. Plant Extract on Nicotine Withdrawal Signs in Mice

SINGH KUNDAN, JAIISHWAR*, ZADE LP, KALE MB, AGLAWE MM, TAKSANDE BG, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTÉE, NAGPUR, 441002

Email: kdrajput447@gmail.com

Aim of present study was to study effect of Achyranthes aspera linn. plant extract on nicotine withdrawal signs in mice. Young Swiss albino mice weighing (20-25 g) used in this protocol. In present study animals were daily injected with nicotine injections

(2 mg /kg, s.c., four times daily, for 10 days). *Achyranthes aspera* Linn. root extract (5, 10 and 20 mg / kg i.p.) was injected before the first daily dose of nicotine from day 1 to 10. After nicotine withdrawal, somatic signs for rearing, grooming, jumping, genital licking, leg licking, head shakes by using the OFT, anxiety in EPM (number of entries and time spent) and depression in FST (immobility time) was analyzed. Results of the present study showed that abrupt withdrawal of daily nicotine injections (2 mg/kg, s.c., 4 times daily, for 10 days) significantly increased somatic signs associated with depression as well as anxiety (decreased the number of entries and time spent in open arm in elevated plus maze) in nicotine dependent animals. Repeated administration of *Achyranthes aspera* Linn. root extract (5, 10 and 20 mg / kg i.p.) before the first daily dose of nicotine from day 1 to 10 attenuated the elevated scores of somatic signs and abolished the depression and anxiety like behavior induced by nicotine withdrawal in dependent animal. The *Achyranthes aspera* root extract can be projected as treatment option for nicotine withdrawal symptoms.

PB-31: Role of Agmatine in Functional Consequence of Locus Coeruleus Neurodegeneration in Alzheimer's Disease

BORKAR ANJALI RAMRAO*,
 DESHMUKH RA, TAKSANDE BJ, KOTGALE
 NR, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF
 PHARMACY, KAMPTREE, NAGPUR, 441002

Email: anjali.borkar48@gmail.com

Swiss albino mice (25-30g) were injected intracerebroventricular injection of β -amyloid (3ng/mouse) on 0 day development of memory impairment was assessed by radial arm maze (RAM) and novel object recognition (NOR). Agmatine (0.5 ng and 1ng/mouse) intra locus coeruleus cannulation and Yohimbine hydrochloride β -2 adrenoreceptor antagonist (0.5-1mg/kg I.p) administered alone or in combination in beta amyloid treated mice for 14 days once daily and animals are subject to memory analysis on 28th. In NOR, all groups displayed reduced exploratory activity in test when animal became familiar with the environment and object. In the RAM beta-amyloid treated group more working and reference memory error and this memory impairment is significantly attenuated by the (agmatine 1ng/mouse) and the memory facilitatory effect of agmatine is reversed by the Yohimbine hydrochloride β -2 adrenoreceptor antagonist (0.5-1mg/kg I.p) also agmatine alter the brain neurochemical level in account of learning and memory improvement. In conclusion present study project agmatine as a potential therapeutic target for memory impairment by beta-amyloid and in addition, modulation of β -2 adrenergic receptors in LC helps in neurodegenerative disorder like AD.

PB-32: Evaluation of Ethanolic Fruit Extracts of Cucumis Sativus (L.) in Dexamethasone induced Insulin Resistance State in Mice

JOSHI SUMIT ASHOK*, DAMA GY,
 BIDKAR JS, PANCHAL CV, PETHKAR SR

SGMSPM'S SHARADCHANDRA PAWAR
 COLLEGE OF PHARMACY DUMBARWADI,
 PUNE, MAHARASHTRA- 412409

Email: sumit.ajoshi87@gmail.com

Insulin resistance is also called metabolic X syndrome, associated with a cluster of abnormalities like type II diabetes mellitus. Fruits, seed and roots extracts of *Cucumis sativus* have been used in the ethnomedicine for several medicinal properties such as cooling, tonic, and diuretic, anti-oxidant, antilucer, anti-hyperglycemic activities. After going through the literature available, its role in insulin resistance state is not yet reported. Hence the present investigation and thorough literature survey, we examined the preventive effect of Cs on insulin resistance state in experimental animals. Insulin resistance in mice was developed by a standardised dose of dexamethasone. Mice are divided into Normal treated and Dexa-treated groups. Dexamethasone and drug treatment are given for 22 days. Results of present study shows that *Cucumis sativus* (200 and 400 mg/kg) dose dependently decrease glucose, triglyceride and insulin in plasma. Also increase the glucose uptake from hemidiaphragm. It increase MDA level as well as decrease GSH, SOD level. The present study provides original evidence that oral administration of Cs have shown preventive effect.

PB-33: Screening of Frankincense oil for Anti-Anxiety Activity in Mice.

PETHAKAR SHRIRAM RAMESH*,
 ARSUDE JB, JOSHI SA, PANCHAL CV

SSPM'S SHRAMJIVI COLLEGE OF PHARMACY,
 OMERGA, OSMANABAD, MAHARASHTRA-
 413606

Email: rampethkar86@gmail.com

According to the world health report (WHO 2001), approximately 450 million people suffer from a mental or behavioral disorder. Frankincense essential oil obtained from *Boswellia carterii* belonging to family- (Burseraceae). Traditionally the oil is good for anxiety, respiration and for removing scars. The objective of the study is to screen the anti-anxiety activity of frankincense oil in mice. The qualitative investigation of oil is carried out for analysis of active chemical constituents. The elevated plus maze, light and dark model and open field test were used to assess the anxiolytic activity of frankincense oil. The result showed that the frankincense oil in EPM, the both dose showed significantly increased in the time spent and number of entries in open arm. In the light and dark model, the 250 mg/kg dose of frankincense oil showed more significant activity than 500 mg/kg. The oil increases the time spent, number of entries as well as rearing in light arena. Further in open field test the significant increase in the locomotor activity. These changes are similar to those induced by the standard anxiolytic diazepam. The results of the present study suggest that frankincense oil possess anxiolytic effect.

PB-34: Pharmacological effect of Metformin in cardiotoxic induced hyperthyroidism in Wistar Rats

ABHISHEK, DARIYAL RAHUL, KIMOTHI VISHWADEPAK, SANWAL RITU*, KAUSHIK MADAN, SINGH SANJAY
SIDDHARTHA INSTITUTE OF PHARMACY,

DEHRADUN, UTTARAKHAND-248001

Email: sanwalritu4@gmail.com

Chronic hyperthyroidism was associated with deleterious cardiac remodeling characterized by myocytes lengthening, chamber dilation, decreased relative posterior wall thickness, increased wall stress and increased left ventricular fibrotic deposition. These also includes rapid heart rate, increased B.P etc. So, present study was designed to establish the consequences when both the complication are together. The effect 8% NaCl and 1% in drinking water model of cardiac remodeling was studied and observed that levels of T3 and T4 were increased and decrease in level of Thyrotropin hormone is restored by Metformin. The mean concentration of T3 were 110 ng/dL and 129 ng/dL & T4 concentration were 4.4 µg/dl and 6.6 µg/dL in the study and control group respectively. The mean TSH concentration was 1.52 mIU/L and 1.62 mIU/L in study and control group. Metformin shows significant increase in T4 5.5µg/dl and T3 119ng/dl levels and increase in TSH concentration upto 3.2 mIU/L. The study shows that, Metformin 125mg/kg has profound effect on increased T3, T4 and decreased TSH level. Significant decrease in T3 and T4 levels and increase in TSH level was noticed. We suggest close regular monitoring of T3, T4, and TSH and further evaluation by specifically designed studies in Diabetic Patients and Hyperthyroid Patients. It also concludes that there will be a harmful effect of Metformin as inducer of Hypothyroidism.

PB-35: Design and Development of Diclofenac-Ranitidine Solid Dispersion by using Co-Processed

Superdisintegrants to formulate Fast Dissolving Tablets

SHESH NARAYAN SHARMA*, ABHAY PRATAP YADAV

R K PHARMACY COLLEGE, KASHIPUR, SURAI, SATHIAON, AZAMGARH, UTTAR PRADESH-276403

Email: snsharmamgs@gmail.com

In the present research work, the effect of a novel- drug-drug solid dispersion approach on the dissolution of poorly soluble Diclofenac sodium (DS) with soluble Ranitidine (RAN) was studied. Solid dispersion of DS with RAN (100:150) was prepared by solvent evaporation technique. Solid dispersions were characterized by FTIR study. Solid dispersions were then compressed into fast dissolving tablets (FDTs) and evaluated for quality control tests. Long-term treatment with NSAIDs may produce gastrointestinal symptoms for which histamine H2-receptor antagonists may be prescribed. Thus, there is a need for a formulation that is not only providing improvement in solubility but at the same time reduces GI adverse effects of DS. The solubility of DS was increased in solid dispersion as observed from phase solubility study by using co-processed superdisintegrants (Sodium Starch Glycolate & Crosspovidone). A decrease in disintegration time, % friability and wetting time was noted with tablet prepared by co-processed superdisintegrants when compared with tablet formulated using Sodium Starch Glycolate, Crosspovidone alone or as compared to their physical mixtures, when compressed directly. This gastric-sparing effect could be attributed to the beneficial action of RAN present in the formulation. Keywords: Diclofenac, Ranitidine, drug-drug solid

dispersion, co-processed superdisintegrants

PB-36: Pyrus Communis Juice- A Natural Cure For Psychosis

ARZOOI*, GOYAL RK, PARLE M

DELHI INSTITUTE OF PHARMACEUTICAL
SCIENCE AND RESEARCH (DIPSAR), NEW
DELHI- 110017

Email: arzoopannu@gmail.com

Aim of the present study is to investigate the anti-psychotic potential of *Pyrus communis* juice in rodents. The fresh *Pyrus communis* (Pear) juice at two different concentrations 50% v/v and 100 % v/v was administered to rodents for 21 d and the anti-psychotic activity was assessed by in vitro methods viz ketamine-induced stereotypic behaviour, swim induced grooming behaviour and pole climbing avoidance in rats, experimental models. On 21 d and neuro-chemical estimation was done. The different concentrations (50% v/v and 100 % v/v) of fresh *Pyrus communis* juice were assayed after chronical administration for 21 d. Administration of Pear juice significantly delayed the latency time taken by the animals to climb the pole in Cook's pole climb apparatus. There was remarkably decreased in ketamine-induced falling, head-bobbing, weaving and turning counts. Whereas, in swim induced grooming behaviour model, there was a significant reduction in swim induced grooming behaviour. Moreover, significantly decreased in the brain dopamine levels and inhibition of acetylcholinesterase activity was recorded. There was significant enhancement in reduced glutathione levels in the brains of mice, which reflect enhanced scavenging of free radicals, responsible for its activity. Therefore,

the present study proved the significant anti-psychotic activity of *Pyrus communis* juice.

PB-37: Evaluation of Methanolic Extract of Clitoria ternatea Hepatoprotective & Nephroprotective Activity in Albino Wistar Rats

SUPRIYA KHANRA*, DEBRAJ
MUKHOPADHYAY2, TARUN
PARASHAR1, ANUJ MITTAL1, PALLAVI
SRIVASTAVA3, PUNEET DHAMIJA4

DEPT. OF PHARMACY, UTTARANCHAL
INSTITUTE OF PHARMACY, UTTARANCHAL
UNIVERSITY, DEHRADUN 2DEPT. OF
PHARMACY & ALLIED HEALTH SCIENCES,
DELHI PHARMACEUTICAL SCIENCE
& RESEARCH UNIVERSITY (DPSRU),
NEW DELHI 3DEPT. OF PSPVPI, INDIAN
PHARMACOPOEIA COMMISSION, GHAZIABAD
4DEPT. OF PHARMACOLOGY, ALL INDIA
INSTITUTE OF MEDICAL SCIENCE (AIIMS),
RISHIKESH, UTTARANCHAL UNIVERSITY, BOYS
HOSTEL BLOCK- F, PIN-248007, PREMNAGAR,
DEHRADUN,

Email :supriyakhanna05@gmail.com

The aim of the study was to investigate the nephroprotective & hepatoprotective activity of methanolic extract of *Clitoria ternatea* in Cisplatin & CCl₄ induced in rats. Methanolic extract of aerial part of *Clitoria ternatea* plant was studied for its Nephroprotective & Hepatoprotective activity in animal experiment models. Nephrotoxicity was induced by Cystone 16 mg/kg b.w. Standard drug was taken Silymarin. Test drug were given methanolic extract *Clitoria ternatea* 500 mg/kg, 1000 mg/kg. Hepatotoxicity was induced by CCl₄. Standard drug was taken cisplatin

100 mg/kg. Test drugs were given extract of *Clitoria ternatea* 500 mg/kg & 1000 mg/kg as per b.w. In Hepatoprotective activity positive control group was provided with CCl₄ and increased SGPT, SGOT, ALP level compare to negative control group whereas Test(2) group was provided with methanolic extract of *Clitoria ternatea* 1000 mg/kg decreased SGPT, SGOT, ALP level compare to standard group. In nephroprotective activity positive control group was provided with CCl₄ increased Urea and creatinine level where as Test(2) group are provided with methanolic extract of *Clitoria ternatea* 1000 mg/kg decreased urea and creatinine level. On evaluating biochemical parameters it was found that methanolic extract of *Clitoria ternatea* 1000 mg/kg showed hepatoprotective and nephroprotective activity in rats.

Keywords: SGPT, SGOT, ALP,
Nephroprotective, Hepatoprotective

PB-38: Different Stages of Diabetes

PUNIT RAI*, SHESH NARAYAN

R K PHARMACY COLLEGE, KASHIPUR, SURAI,
SATHIAON, AZAMGARH, UTTAR PRADESH
276403

Email :punit.j.rai@gmail.com

Diabetes is a disease that affects 18.2 million people in the United States alone. Diabetes is a chronic disease in which the body does not produce or properly use insulin, a hormone that is needed to convert sugar, starches and other food into energy needed for daily life. Diabetes is a very serious disease often overlooked. This disease results when there is a high level of sugar in the blood for an extended period of time. It can be controlled by diet, exercise, pills and insulin injections. There are three main types

of diabetes--Type I, which affects primarily the younger population; Type II, which primarily affects the population above 40; and Type III, gestational diabetes, which affects women during the third trimester of their pregnancy. Symptoms may include excessive thirst, hunger, urination and weight loss. A group of metabolic risk factors that raise the risk of type 2 diabetes in one person, including: abdominal obesity (excessive fat tissue in and around the abdomen); atherogenic dyslipidemia (blood fat disorders—high triglycerides), low HDL cholesterol, and high NCE (New chemical entity). The goal from a diet perspective is to control your sugar in the blood stream in such a way that the insulin in the bloodstream can manage it efficiently. In addition to diet, medication and exercise play a key role in controlling the diabetes.

PB-39: Medicinal Properties of Ocimum tenuiflorum

BHASKAR*, PUNIT RAI, SHESH NARAYAN

R K PHARMACY COLLEGE, KASHIPUR, SURAI, SATHIAON, AZAMGARH, UTTAR PRADESH 276403

Email: bhaskarkumar7676@gmail.com

Tulsi is a Sanskrit word which means “matchless one”. Several medicinal properties have been attributed to the Tulsi plant not only in Ayurveda and Siddha but also in Greek, Roman and Unani systems of medicine. In Ayurveda, Tulsi used as antiasthmatic and antikaphic drugs. It is also used in treatment of fever, bronchitis, arthritis, convulsions etc. Scientific explorations of traditional belief of medicinal properties of Tulsi have got momentum mostly after the middle of the 20th

century. Ocimum sanctum (Tulsi or holy basil) has a very special place in the Hindu culture. The present study was focused on evaluation of antimicrobial activity of Ocimum sanctum leaf extract in normal tap water and local river water. Plants are of the important sources of medicine & a large numbers of drugs in use are derived from plants. The therapeutic uses of plant are safe, economical .

Keyword : Ocimum sanctum, Antimicrobial effect, Minimum Bactericidal Concentration, Microbial growth.

PB-40: Digital Biomarkers for Mood Disorder

MS. SARITA SINGH*, DR. MANJU PANDEY, MEHSEEN, ABHISHEK PATEL

AZAD INSTITUTE OF PHARMACY AND RESEARCH, NATKUR, LUCKNOW, UTTAR PRADESH-226008

E-mail: sharitasingh22@gmail.com

Current approaches to psychiatric assessment are resource intensive require time consuming evaluation by trained clinician. Digital biomarkers are data that consumers directly collect about health or disease management through digital technologies to explain, influence and/or predict health related outcomes. Mood disorder (i.e. major depressive disorder (MDD),bipolar II) occur in 12% of population in their lifetime, resulting in substantial functional and economic burden. To reduce burden it is critical to diagnose using accessible methods which enable timely detection of clinical deterioration. Use of digital biomarkers offers an alternative assess to mood disorder that is scalable, un-obstructive, time-sensitive and cost-effective as compared

to standard clinical assessments.Movement of data from actigraphs(which measures motor activity from sensor) may be especially useful for detecting MDD or bipolar disorder characterized by increase or decrease in directed behaviour, energy level and movement in addition to sleep which are captured via actigraph. Thus the present approach aimed to identify robust digital biomarkers to diagnostic status and symptom severity. Actigraphy data collected in patients with MDD and healthy controls suggested that diagnostic status of participants can be predicted with a high accuracy and precision using features extracted from actigraphy,data,alone.

Keywords: Digital biomarker, MDD, Actigraph.

PB-41: Arsenic induced oxidative stress and alteration in the activities of antioxidative enzymes in Oryza sativa L. plant and counteract by Paeonol extracted from paeony root

REHMAN FAISAL*, REHMAN F

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN,UTTARAKHAND, 248009,

Email: rfaisal71@yahoo.com

Present study assessed the toxic effect of arsenic and their counteract with paeonol on the growth, biomass, and on different antioxidant scavenging enzymes such as ascorbate peroxidase (APX), guaiacol peroxidase (GPX), catalase and superoxide dismutase (SOD) in rice seedling. In the experiment, plant was

cultivated on hydroponic medium and treated with arsenic solution of the concentrations varies 100 μ M, 50 μ M, and 10 μ M. Results conclude that arsenic was more toxic for root growth, than for shoot growth and damage to the epidermal cells and aerenchymatous cortex. Activities of superoxide, ascorbate peroxidase, catalase, guaiacol peroxidase, were increased when treated with different concentration of arsenic. In arsenic treated seedling, the oxidative stress has been observed due to over production of reactive oxygen species resultantly, the level of H₂O₂ and malondialdehyde contents were increased. Thus, upregulation of APX, SOD, CAT, GPX, activities play an effective role in acclimatization to arsenic stress. Joint treatment of Paconol with arsenic showed significant alteration on all parameters tested under the purview of arsenic treatment alone, leading to better growth in rice seedling due to substantial reduction of over production of ROS.

PB-42: Photodynamic therapy: A specific cancer treatment

RAYKA JITENDRA*, CHATURVEDI VARUNESH, MUKIM MOHAMMAD

KOTA COLLEGE OF PHARMACY, RANPUR, JHALAWAR ROAD, KOTA- RAJASTHAN-32500.

Email: raykajitendra180199@gmail.com

Photodynamic Therapy (PDT) is a clinically approved (1993) therapeutic procedure for causing selective cytotoxic activity towards malignant cells. PDT involves administration of a photosensitizer that absorb light of specific wavelength. In presence of oxygen, a series of event lead to direct tumor cell

death by producing reactive oxygen species, microvasculature blockage and induction of local inflammatory reaction in tumor cell. Photofrin is the widely used photosensitizer in PDT treatment. Clinical study revealed that early stage cancer can be curable with PDT and it can prolong the life of patients with inoperable cancer. PDT has been used in many countries for lung tumor, brain tumor, head and neck tumor, breast cancer, oesophageal cancer etc. Due to specificity for tumor cell and less toxicity for healthy cells PDT become popular treatment in various developed countries.

PB-43: Neuroprotective effect of harmine against 3-nitropropionic acid induced neurotoxicity in rats

CHANDOLIA PRIYANKA*, ARORA A, KUMAR P

DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY, MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, BATHINDA-151001, PUNJAB

Email: priyankachandolia42@gmail.com

Huntington disease (HD) is a devastating, autosomal dominant inherited neurodegenerative disease characterized by progressive motor, behavioral, and cognitive decline. Enhancing glutamate transporter (GLT) expression has been reported to be beneficial in neurodegenerative disorders. Harmine has been documented to possess wide spectrum of pharmacological actions, including upregulating GLT, anti-oxidative action and neuroprotective potential in various animal models of neurological disorders. The present study was designed to investigate the

effects of Harmine in 3-Nitropropionic acid (3-NP) induced neurotoxicity in rats. 3-NP was administered for 21 days (10 mg/kg i.p.) in rats and these animals were treated with vehicle or different doses of harmine (10, 20 and 40 mg/kg p.o.). Harmine treatment attenuated 3-NP induced behavioral and biochemical alterations. Among the doses selected, harmine (10 & 20 mg/kg p.o.) was observed to be most effective in improving rotarod, transfer latency, time taken to cross the beam and locomotor activity in rats. Further, harmine significantly attenuated oxidative stress in 3-NP treated rats. The outcomes of present study suggest that harmine is beneficial and might emerge as an adjuvant or prophylactic therapy for 3-NP induced neurotoxicity in rats.

PB-44: Cath-bot: first step towards an independent heart catheterization robot.

SINGH SARITA*, PANDEY MANJU

AZAD INSTITUTE OF PHARMACY & RESEARCH, NATKUR, LUCKNOW, UTTAR PRADESH-226008.

Email: manju16824@gmail.com

Heart catheterization rely on fluoroscopic imaging for guidance which exposes the staff and patient to harmful radiation, human error also an important factor of morbidity and mortality. The ultimate goal of CATH-BOT is a self- directed robot which is capable of performing remotely supervised catheterization without ionizing radiation. CATH-BOT will create a patient specific 3-D anatomical model by obtaining recent pre-procedural imaging within the hospital ERS (eg. MRI) and also uploaded images from outside sources. The 3-D anatomical model is co-registered with patient



real time imaging prior to procedure. Catheter location and course are continuously tracked by an EMTS which is also co-registered. Thus CATH-BOT is aware of real- time catheter position in relation to patient anatomy without the need of fluoroscopy. Catheter movement is accomplished using a robotically steerable catheter. CATH-BOT will have pre-programmed CMA's which is attained through integrating catheter position, desired location and real-time anatomical map. Safeguards include redundant force sensors, mechanical restraints. Future integration of computational creativity and deep learning via artificial neural network will raise the level of catheter manipulation to that of human operator, all without radiation. The goal of CATH-BOT is procedural independence, EMTS prototype performed well & development of steerable catheter and CMA database is on progress.

PB-45: Congenital Insensitivity

BHARDWAJ AAKASH*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BHADURGARH, HARYANA-124507

E-mail: iamaksbhardwaj@gmail.com

The purpose of this is to gather a report on Congenital Insensitivity to pain. The data for the gathered information in report is graded from PubMed, research gate, Elsevier, science direct, and science daily. In this article, it has been demonstrated the signs and symptoms of some patients that refer to the pediatrics department, hospital and assay about their difficulties with this disorder. CIP is caused by the mutation in SCN19 gene and in rare cases it is caused by mutation in PMRD12 gene. It is inherited in an autosomal recessive

pattern. They mostly presented by recurrent osteomyelitis in their feet that severely controlled by antibiotic therapy and even surgery. They had no pain sensation inspite of deep sore and infection. CIP is an extremely rare condition in which there is a failure of development of the sensory nerve leading to lack of pain awareness. This syndrome can be diagnosed by clinical and paraclinical tests together but it would be better to confirm by genetic test. The diagnosis of this syndrome helps us to try for the better quality of life for the patients and avoid unnecessary amputations.

PB-46: Hair Loss

SHIKHA*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BHADURGARH, HARYANA-124507

E-mail: shikhashthana111@gmail.com

This data for the report is gathered from pub med, research gate, elsewhere, science direct and science daily. Hair loss is a common condition. It can be caused by variety of disorder and due to some deficiency in nutrients. Acute alopecia lasting upto 6 month or less. 11 drug that cause hair loss eg Cimetidine, amphetamine etc.. Hair loss which lasted more than 6 month defined as chronic hair loss. 89 drug caused chronic hair loss eg. amitriptyline, levodopa etc. Drug that is commonly used are minoxidil and fiansteride. Minoxidil help in vasodilation of blood vessel due to which supply of blood or oxygen is increases in hair follicle. Fiansteride [For men] work by inhibiting the enzyme 5 -alpha reductase which convert the enzyme testosterone into dihyrotestosterone[DHT] . It block the hair follicle and cause hair loss. Recent advances : like micro LED AND 3D PRINTING. It was concluded that Expect minoxidil and fiansteride there are different drug which are are used for treatment of

hair fall like rapamycin , metformin , alpha ketoglutyrate help in hair loss therapy by modulation in AMPK and Mtor signalling pathway.

Keywords : Fiansteride, minoxidil, 5 alpha reductase and dihydrotestosterone (DHT), Alopecia.

PB-47: Hutchinson-Gilford Progeria Syndrome

GOYAL MEGHA*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BHADURGARH, HARYANA-124507

E-mail: goel.mega1116@gmail.com

PROGERIA The data for the gathered information in report is graded from PubMed, research gate, Elsevier, science direct, and science daily. Progeria is an extremely rare genetic disorder that cause premature, rapid aging shortly after birth. Hutchinson-Gilford progeria syndrome, a major type of progeria is caused by defect in lamin protein (progerin) A or C, which is encoded by LMNA gene. Lamin A is a major nuclear component that determine the shape and integrity of the nucleus. Mutation in LMNA gene encoding for A-type lamin disrupt the integrity of nuclear function causing cellular decline. It seems that same molecular mechanisms which are responsible for premature aging of cells of progeria patient , are involved in physiological aging because progerin is also produced in senescent cells and cells of old individuals, suggesting that progerin accumulation might be a factor in physiological aging. Hutchinson-Gilford progeria syndrome is a genetically heterogeneous group of hereditary disease. The current review conclude that the replication



stress is a major cause of genomic instability which further contribute to the aging process. Elucidation of the molecular mechanism of this disease may be useful in defined treatment of this devastating disease. This should enable the development of treatments that might be applicable to general processes of aging as well.

PB-48: Glioblastoma Multiforme

**SAHU SANSKRITI*, KIRAN ,
CHAUDHARY HEMA**

**PDM UNIVERSITY, BHADURGARH,
HARYANA-124507**

E-mail: sanskritisahu99@gmail.com

An overview of Glioblastoma multiforme and future aspects of treatment. This data for the report is gathered from Pub med, research gate, elsewhere, science direct and science daily. Glioblastoma multiforme is one of the most aggressive and malignant type of CNS tumor. It is also known as grade IV astrocytoma by WHO. Literature revealed the pathogenesis to involve multiple signalling pathway through multiple genetic mutation and gene expression. Despite new insights into Glioblastoma pathophysiology, the prognosis for patient diagnosed with this highly aggressive tumor remain bleak. Current treatment combine surgical resection and chemoradiotherapy leading to an overall increase in survival for 12.1 to 14.6 months. Ongoing preclinical and clinical studies evaluating efficacy of novel therapy provide hope for increasing survival benefit. This article focus on the advancement in Glioblastoma treatment in newly diagnosed and recurrent glioblastoma including novel therapies such as antiangiogenic agents,

mammalian target of rapamycin inhibitor and immunotherapies. The present study conclude that advance novel therapies provide hope for increasing survival benefit.

KEYWORDS: Glioblastoma multiforme, chemotherapy, antiangiogenic agents, astrocytoma.

PB-49: Pharmacoeconomic and cost-effectiveness study of anti-hypertensive agents

MALLINATH VP*,BIRADAR SM, KAYUM HL,

**BLDEA'S SSM COLLEGE OF PHARMACY & RC,
VIJAYAPUR,**

Email: mallinathp91@gmail.com

Black pepper (*Piper nigrum*) has been used in folk medicine as stomachic, aromatic, diaphoretic and hepato-protective. *Helicobacter pylori* is identified as gastric carcinogen and known to cause gastric cancer by injecting virulent toxin CagA and translocating VacA. Black pepper is known to have antioxidant, antiulcer activity and gastro protective effects. Therefore, the present work aimed at the preparation and evaluation of floating tablets of black pepper extract. In the current experiment, we have developed gastro-retentive floating tablets of standardized pepper extract by direct compression method and evaluated for various in vitro parameters. Tablets containing HPMC K100M, pepper extract, sodium bicarbonate, talc, magnesium stearate and colophony were prepared by direct compression method and evaluated. Formulations were optimized based on buoyancy time and in vitro drug release. Optimized formulation showed good floating

behavior along with better controlled drug release. The successful formulation was found to be F3 and its buoyancy time was less than one minute and drug release was up to 10 hours. We conclude that, the developed formulations can be effectively used to treat ulcers and in the prevention of gastric carcinogenesis.

PB-50: Assessment and Evaluation of Drug Information Services by Clinical Pharmacist.

SANATKUMAR B NYAMAGOUD*,AHMV SWAMY

**DEPARTMENT OF PHARMACY PRACTICE,
KLE COLLEGE OF PHARMACY,
VIDYANAGAR,HUBBALLI ,KARNATAKA-580031**

E-mail: dr.sanathnyamagoud@gmail.com

Drug information service (DIS) are the services that aims to promote safe, effective and economic use of medicinal products by the provision of accurate, current, independent, evaluated information to improving of patient care and quality of life. To assess & evaluate, professional status & specialty of enquirer, purpose of enquiry, Time frame for reply, sources used for information. Study Site: DIC at VGH. Duration: 6 months. A prospective study. Inclusion: Drug information enquiries from health care professionals. Drug information enquiries from others. Source of Data: Drug information request forms. A total number of 90 queries were received. Most of the queries were received from general medicine department 62(68.88) and least were from general surgery 2(2.22%). Most of the queries were for update of knowledge 52 (57.77%)

and time frame for reply was within a day 42 (46.66%), answers were given in printed format 39(43.33%). The majority of queries were regarding dose and administration of drug 56 (62.22%) and most preferred resource was Micromedex 76 (84.44%). Services provided by the centre was appreciated by majority of its users however there is a need to bring greater awareness about the service in the hospital and to encourage the healthcare professionals to utilize the services for better patient care.

Keywords: Drug information centre, Drug information services.

PB-51: Cost Analysis of Various Brands of Corticosteroids in Dermatology Department at a Tertiary Care Teaching Hospital

SRINIDHI B C*, SIMRAN S, ANIL A, JOEL JJ

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail: nidhibh95@gmail.com

The study will analyze the cost variability between different Corticosteroid drugs commonly prescribed in Dermatology department. Among the out-patients who visited the dermatology department, a 6 month prospective study was conducted, Price of particular drugs available in different strength

and dosage form which are manufactured under different brands were compared. Drugs that are available under a single brand were excluded. The study showed that 300 prescription contains 817 drugs, number of drugs per prescription was 1-8 with average of 2.72 drugs per prescription, out of which very few were prescribed in generic name, Among corticosteroids that are prescribed as single drug therapy, price variation of Prednisolone (5mg) shows maximum variation in price of 4408.67% followed by Mometasone (0.1%) of 501.42%, whereas Methylprednisolone (8mg) showed minimum Percentage price variation of 3.87%. out of 10 combinations which are commonly prescribed, Beclomethasone + Clotrimazole (20gm) shows maximum price variation of 918.18% followed by Clobetasone and Salicylic acid and least price variation was seen in combination of Betamethasone + Fusidic acid (15gm) 5.12%. Cost analysis of various brands of Corticosteroid available in the market reports that, there is huge difference in price variation among Corticosteroids used in Dermatology Department.

Key Words: Corticosteroid, price variation

PB-52: Prescribing Pattern of Gastroprotectives and Antibiotics Along With Analgesics Among Post Operative Patients

BHAVANA C K*, VADAKKAN K, ALTAF M, NANDAKUMAR U P

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF

PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail address: bhavanack96@gmail.com

To evaluate the prescribing pattern of gastroprotectives and antibiotics along with analgesics among post-operative in-patients in the orthopedics department of a tertiary care teaching hospital. A retrospective study was carried out for a period of six months from September 2018–February 2019. Post-operative usage pattern of gastro-protective agents and antibiotics were analyzed by collecting drug therapy details of patients from case sheets including treatment charts and analyzed by descriptive statistics. A total of 400 patients prescribed with analgesics were selected for the study, out of which, 237 (59.25%) were males whereas 163 (40.75%) were females. Cefazolin (39.10%) was found to be the most commonly prescribed antibiotic agent followed by Cefuroxime (21.48%) and Cefixime (20.47%). Among gastroprotective agents prescribed, 89.21% belonged to the class of Proton Pump Inhibitors (PPIs) whereas 10.79% were H2 receptor antagonist. Drug utilization studies when done periodically can help in modulation of therapy of patients. The current study provides an insight to the health care providers on the importance of rational use of antibiotics and gastroprotectives which in turn helps in the delivery of good quality health care.

PB-53: A Prospective Study on The Prescribing Pattern and Cost Analysis Of Antibiotics in an Out Patient

Dermatology Department At A Tertiary Care Teaching Hospital

SIMRAN S*, ANIL A, SRINIDHI B C, JOEL JJ

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail: shareensimran313@gmail.com

To assess the prescribing pattern of various Antibiotics in the management of skin disorders and to analyse the price variation between various brands of Antibiotics. After taking Ethics committee's permission, prescriptions of 300 patients attending Dermatology OPD between September 2018 – March 2019 were audited. The prescriptions were analysed for commonly prescribed antibiotics and percentage price variation among different brands of antibiotics were calculated. Drugs available under a single brand were exempted. Out of 300 prescriptions, 107 patients were prescribed with 171 antibiotics. Topical antibiotics were most commonly prescribed (69.59%), followed by oral antibiotics (29.82%) and parenteral antibiotics (0.584%). It was found that fusidic acid (29.90%) was the most commonly prescribed antibiotic followed by Clindamycin (16.82%). In price variation study of Antibiotics used as single drug therapy, Azithromycin (250mg) shows maximum price variation of 1607.23% followed by Minocycline (45mg) of 473.68% and least price variation was seen in Fusidic acid (5gm) of 2.45%. Fusidic acid was found to be the most commonly prescribed antibiotic. Cost analysis study showed

significant difference in the price of drugs among various brands of antibiotics available in the market.

Key words: Antibiotics, Prescribing pattern, Price variation

PB-54: A Retrospective Study on Post-Operative Usage Pattern of Analgesics in Orthopaedics Department Of A Tertiary Care Teaching Hospital.

ALTAF M*, BHAVANA C K, VADAKKAN K, NANDAKUMAR U P

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail: mohammedaltaf252@gmail.com

To evaluate the prescribing pattern of analgesics and to know the most routinely prescribed analgesic for post-operative pain management in Orthopaedics department. A retrospective study was carried out for a period of six months from September 2018–February 2019. Post-operative usage pattern of analgesics were analysed by collecting drug therapy details of patients from case sheets including treatment charts and analysed by descriptive statistics. Out of the total 400 cases selected for the study, 237 (59.25%) were male whereas 163 (40.75%) were female. Open Reduction and Internal Fixation (ORIF) 93 (23.25%) and Closed Reduction and Internal Fixation (CRIF) 90 (22.50%) were the most common surgical

procedures performed. Drugs were given more as combination therapy 295 (73.8%) than Monotherapy 105 (26.2%). The most commonly prescribed agent among patients who received single analgesic therapy was Diclofenac. Among Fixed dose combination therapy Paracetamol + Tramadol 173 (58.64%) was found to be the most prescribed analgesic. 465 (59.46%) of analgesics were given orally whereas 317 (40.53%) were administered parentally. The current study provides an insight to the health care providers on the importance of rational use of analgesics that in turn helps in the delivery of good quality health care.

Key words: Analgesic, Pain, Orthopedic.

PB-55: Study of Prescribing Pattern of Antifungal Drugs In out Patient department of Dermatology In A Tertiary Care Hospital

RISHAB P*, RASHMEEN N, BHARATH K C, SHRICHARITH S

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail address: rishab0711@gmail.com

To study the prescribing pattern of Antifungal drugs and cost variability between different Antifungal drugs prescribed. This is a prospective observational study done at Justice KS Hegde Medical College and Hospital, Mangaluru, Karnataka. From August 2018 to April 2019, 400 OPD patients from the

department of dermatology were taken who were diagnosed with fungal infection. Factors taken into consideration were age, gender, types of diagnosis and types of antifungal drugs prescribed. Price variability among different brands of drug were included. 400 antifungal drug prescription were analysed. More than 50% of the patients were from the age group 21-40 yrs. Male (51.8%) were more than that of females (48%). Majority of the drugs prescribed were topically (64%) than orally (36%). Azole group of antifungal was the most prescribed group. Most commonly prescribed antifungal drug was found to be Luliconazole (33.8%) which is newer azole antifungal drugs. It was followed by ketoconazole (30%) and terbinafine (28.1%) respectively. The study also showed that the cost of prescription was high because of the prescription of branded drugs.

Key words: Prescribing pattern, Antifungal, Superficial infection, Price variability

PB-56: A Study on the Severity of Pain among Cancer Patients

ARCHANA P*, DOMINIC K S, JOSE A, NANDAKUMAR U P

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail: archanaprabhumaroli@gmail.com

To study the severity of pain among cancer patients before and after therapeutic intervention. A prospective study was conducted among 180 cancer patients in the department of Oncology of a tertiary care

teaching hospital. The study was conducted for a period of six months from September 2018 to February 2019. A data collection form was prepared to collect information on patient's socio-demographics, diagnosis, analgesic agents prescribed and other relevant details. Self-administered Visual Analogue Scale (VAS) was used to assess the pain severity. Out of 180 cancer subjects enrolled, 52.8% were males and 47.2% were females with mean age of 48.57±1.213. 91 (50.6%) patients were found to have experienced moderate pain, 63 (35%) experienced mild pain and 26 (14.4%) experienced severe pain before therapeutic intervention. 175 patients received therapy with single analgesic agent whereas 5 received a combination of two agents. The therapeutic intervention for the pain presented by the patient was highly effective as 14.4% of total cases of severe pain was reduced to 1.1%. The intensity of pain was relatively high among patients before therapeutic intervention. Pain severity had substantially reduced on receiving analgesic agents which proved that the treatment was highly effective, further improved the quality of life of patients.

Keywords: Cancer, Pain severity, Analgesics

PB-57: A Study on Drug-Drug Interaction among Chronic Kidney Patients in Tertiary Care Teaching Hospital

SHANFAR I*, ROY A D, RAJ B

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE

KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail: ibrahimshanfar@gmail.com

To study the frequency of drug-drug interactions (DDIs) occurred among chronic kidney disease (CKD) patients. A six months prospective observational study was conducted among 200 hospitalised adult CKD patients in a tertiary care teaching hospital. A total of 200 CKD patients were enrolled among which 66% were males and 34% were females. 2239 medication orders were reviewed and 529 DDIs were observed. the most frequent class of drug responsible for interactions were Antihypertensives, Minerals, Insulin, loop diuretics, Antacid, Antiemetic. DDIs pose a major challenge to health care providers which results in significant failure in the provided pharmacotherapy of the CKD patients. Pharmacist can contribute in providing better clinical outcomes by implementing optimal pharmaceutical care.

Keywords: CKD, DDIs

PB-58: A Retrospective Study on Drug Utilization Pattern In Management Of Rheumatoid Arthritis

SHRADHA S*, RISHAB P, MEHANEESHA K, ANJALY V

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail: shradha173@gmail.com



To evaluate the drug utilization patterns in the treatment of RA in the Orthopedic department of a tertiary care hospital in Mangaluru. A retrospective study was carried out in the Orthopedic department for a period of six months (September 2018- March 2019). Medical records of patients diagnosed with RA during 2013-2017, who satisfy the inclusion and exclusion criteria were retrieved and reviewed. Relevant details of patient demographic profile and drug therapy details including drug name and dose for each patient was collected and summarized using descriptive statistics. Out of the 400-medical record of patients reviewed in the study, it was found that occurrence of RA was predominantly higher in females (79.2%) than that of males (20.8%). The age group in which disease most commonly observed was between 50 to 69 years (Male – 55.4%, Female – 48.9%). The most commonly prescribed DMARDs for the treatment were Methotrexate (52.7%), followed by Hydroxychloroquine sulphate (42.5%) and Sulfasalazine (2.8%). Deflazacort (37.1%) was the most prescribed corticosteroid whereas Hydrocortisone (3.9%) was the least prescribed drug. Drug utilization pattern provides a classic frame of trends in prescribing according to various general practitioners. Hence, will help to improve patient management by rationalizing drug use.

Keywords: RA, DMARDs, Corticosteroids

PB-59: A Retrospective Study on Comorbidities and Infections Associated With Rheumatoid Arthritis

MEHANEESHA K, RISHAB P*, SHRADHA S, ANJALY V

DEPARTMENT OF PHARMACY PRACTICE,
NITTE GULABI SHETTY INSTITUTE OF
PHARMACEUTICAL SCIENCE , JUSTICE
KS HEGDE HOSPITAL, DERELAKATTE,
MANGALORE-575018

E-mail: kateejamehaneesha@gmail.com

To evaluate the comorbidities and infections associated with Rheumatoid Arthritis and their management. A retrospective study was carried out in the Orthopaedic department for a period of six months (September 2018 - March 2019). Medical records of patients diagnosed with RA during 2013-2017, who satisfy the inclusion and exclusion criteria were retrieved and reviewed. Relevant details of patient demographic profile, associated comorbid conditions and infections with its management for each patient were collected and summarized using descriptive statistics. Out of the 400 medical records of patients reviewed in the study, it was found that occurrence of RA was predominantly higher in females (79.2%) than that of males (20.8%). Among the total 400 patients with RA, 331 patients were observed to have comorbidity. The most common comorbidity observed in RA patients was Anaemia 100 (30.21%) followed by Hypertension 70 (21.14%) and Type II Diabetes Mellitus 62 (18.73%). Out of the 11 patients who developed RA associated infections, Tuberculosis 6 (54.5%) and Urinary tract infection 4 (36.4%) were the most commonly diagnosed infections. The choice of RA treatment and its outcomes are influenced by the associated comorbid conditions and infections. Therefore, to rationalize drug use and for successful management of RA in patients, the comorbidities and infection should be

taken into consideration.

PB-60: A Study on Diagnostic Criteria of Gestational Diabetes Mellitus and Its Clinical Management

GRACERITY N*, SHEBIN K, ALBY T, BHARAT K

DEPARTMENT OF PHARMACY PRACTICE,
NITTE GULABI SHETTY INSTITUTE OF
PHARMACEUTICAL SCIENCE , JUSTICE
KS HEGDE HOSPITAL, DERELAKATTE,
MANGALORE-575018

E-mail: gracerity95@gmail.com

To document the diagnostic criteria and clinical management for GDM. Gestational diabetes mellitus (GDM) may result in maternal as well as foetal complications that can increase the foetal mortality and morbidity. This prospective observational study was conducted on in-patients and out-patients of Obstetrics and Gynaecology Department at Justice K.S.Hedge Charitable Hospital, Deralakatte, Mangaluru. Subjects were enrolled based on the inclusion criteria. The data was collected from subjects, their relatives, in and out patient's clinical records. A total of 207 pregnant women were enrolled and 89 were diagnosed with GDM. Above the severity percent the pregnant women underwent glucose challenge test during their first antenatal visit due to presence of high risk factors. In the study, 57% women achieved good glycaemic control with the clinical management. Metformin was the most prescribed drug during all trimesters (3.3%, 7.8%, and 31.4%) as compared with insulin

(2.2%, 2.2%, and 6%). 77% had good control of blood sugars with insulin therapy and 83% of women achieved target blood sugar levels with combination therapy. Lack of uniform diagnostic criteria for gestational diabetes mellitus has often led to misconceptions and under treatment of GDM. Thus, the prevention and management of GDM must be given enough importance throughout pregnancy.

Keywords: Gestational Diabetes Mellitus, GCT, metformin, insulin

PB-61: Analysis of Drug Related Problems Among Patients Admitted In Pulmonary Medicine Department of A Tertiary Care Teaching Hospital

DSOUZA M D*, TOM J, SHAJI J, RAJESH K S

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail: dencita11dsouza@gmail.com

The focus of the current study was to analyse various DRPs in respiratory disease patients. A prospective observational study was conducted among hospitalized patients in Pulmonary Medicine Department for a duration of 6 months. All the patients diagnosed with respiratory diseases were followed and reviewed on daily basis for the assessment of DRPs. A

total of 97 patients were enrolled out of which 63 developed 223 DRPs making a proportion of 2.29 DRPs per patient. The overall incidence of DRPs during the study period was found to be 64.9%. Among them 136(60.98%) were potential DRPs and 87(39.01%) were manifested DRPs. The highest percentage of DRP occurred was potential ADE (37.66%) category followed by manifested ADE(29.14%) and effect of drug treatment not optimal (potential)(21.97%) and the causes for the development of DRPs are Interacting combination of drugs(69.46%), ADRs(20.79%) and Dose timing instructions wrong/unclear/missing(3.98%). As the intention of resolution of DRPs 272 interventions were made where the maximum frequency was for Prescriber informed only (37.13%) followed by Drug stopped (23.89%) and Side effects reported(17.27%). Out of 223, 76.68% DRPs were totally solved. The study lights up the analysis of various DRPs, causes, intervention and outcome of intervention for the management of DRPs in respiratory disease patients.

Keywords: Drug related problems, adverse drug event, adverse drug reactions.

PB-62: Distribution of Drug Related Problems among Patients with Respiratory Diseases

TOM J*, SHAJI J, DSOUZA M D, RAJESH K S

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE, JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

E-mail: jeffintom94@gmail.com

To study the distribution of Drug Related Problems (DRPs) among patients diagnosed with respiratory diseases in a tertiary care teaching hospital. A prospective observational study was conducted among hospitalized patients in Pulmonary Medicine Department for a period of 6 months. Treatment records of all patients satisfying the inclusion criteria were analyzed and reviewed on a daily basis for identifying DRPs using PCNE Classification. Out of 97 patients, 63 patients developed a total of 223 DRPs. The percentage occurrence of DRPs during the study period was found to be 64.9%. The study showed that occurrence of DRP was higher among males(67.24%) than females(61.53%). Potential ADE was found to be the highest reported problem among both males(34.12%) and females(42.26%) enrolled. Patients aged ≥ 65 had the highest rate of occurrence of DRP (66.66%) and manifested ADE(37.33%). The study also showed that overall occurrence of DRP was highest among patients diagnosed with single respiratory disease and extra-pulmonary co-morbidities(73.68%), followed by patients with multiple respiratory diseases and extra pulmonary co-morbidities(71.42%) and multiple respiratory disease without extra-pulmonary co-morbidity(66.66%). The present study spread light on the occurrence of DRPs among patients with respiratory diseases. It also emphasize on the need of timely identification and management of such problems for better patient care.

PB-63: Refsum Disease

FARHEEN

IRAM

,BAJPAL,IRAM,TRIPATHI,FATIMA

AZAD INSTITUTE OF PHARMACY AND RESEARCH, NATKUR,LUCKNOW, UTTAR PRADESH-226008 .

Email: iramfarheen212@gmail.com

Non-medicated treatment of Refsum disease – Diet should be low in phytanic acid (found in dairy products, beef, lamb etc.) Medicated treatment- The removal and reinfusion of blood plasma (plasma pheresis) may also be required. Histopathologic examination of the skin from a suspected patient commonly shows hyperkeratosis, hyper-granulosis and acanthosis. The presence of cells in the basal and super basal layers of the epidermis containing variably sized vacuoles with accumulated lipids is pathognomonic for the disease.

Key names- adult refsum disease, phytanic acid storage disease, refsum syndrome.

PB-64: A Study on Prescription Pattern in Paediatric Population

MATHAI DEBBIE*, SALIM S, HINGE R, JOEL J J

DEPARTMENT OF PHARMACY PRACTICE, NITTE GULABI SHETTY INSTITUTE OF PHARMACEUTICAL SCIENCE , JUSTICE KS HEGDE HOSPITAL, DERELAKATTE, MANGALORE-575018

Email: debbiemathai96@gmail.com

Aim of present study was to study the paediatric prescription and to identify the commonly prescribed drugs. A prospective observational study of six months duration was conducted in the paediatric department (outpatients and in-patients) of a tertiary care teaching hospital.

A suitable data collection form was designed to collect patient demographic details and drug details. Data were analysed using descriptive statistics. A total of 340 patients were included in the study. A total of 1091 drugs were prescribed, among which the most commonly prescribed drug class was antibiotics (25.93%) followed by antipyretic and anti-inflammatory agents (16.68%). Acetaminophen was the most frequently prescribed drug (14.57%) followed by amoxicillin-clavulanic acid (12.09%) and Chlorpheniramine (3.66%). Among the antibiotics prescribed, the most frequently prescribed antibiotic class was penicillin (49%) followed by cephalosporins (24.25%) and aminoglycosides. Among the different dosage forms, syrups were most commonly prescribed. The study reports the increased use of antibiotics, which can be reduced for the treatment of viral infections by formulating treatment guidelines and improvising the prescribing of pediatrics.

PB-65: Thyroxine Activity of Phyllanthin and Hypophyllanthin on Female and Male Wistar Rats

PARAS GUPTA*, ASHISH KUMAR, TANYA KUMAR, S.S. AGRAWAL

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCE AND RESEARCH (DIPSAR), MEHRAULI NEW DELHI-110017.

E-mail: paaaras20@gmail.com

The thyroid gland is a butterfly-shaped endocrine gland located in the base of the neck. It releases two major hormones T3

(triiodothyronine) and T4 (tetraiodothyronine). Hypothyroidism is the disease state in humans and animals caused by insufficient production of thyroid hormone. Hypothyroidism is treated with the levothyroxine form of thyroxine (L-T4) and triiodothyronine (L-T3). But they may cause various side effects and may also be economically costly. Herbal drugs have been used since ancient time for curing various diseases. One such plant is *Phyllanthus amarus*, it is used as a hepatoprotective. Since, the liver metabolises the thyroid hormones T3 and T4; therefore, in a liver disorder the serum concentrations of both the thyroid hormones may be affected. Encouraging results were obtained when isolated compounds of *Phyllanthus amarus* viz., Phyllanthin and Hypophyllanthin showed thyroid activity quantified by inducing hypothyroidism in rats using chemical agents like Propylthiouracil. Various parameters such as Total protein, total cholesterol, T3 and T4, TSH, daily food and water intake, histopathological parameters, reproductive hormones, weekly body weight, thyroid weight were estimated.

PB-66: To Study the Prevalence of Diabetes Associated with Hypertension in Delhi NCR

KUMAR ASHISH*, GUPTA PARAS, PRAKASH UIDAI, GUPTA SK

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCE AND RESEARCH (DIPSAR), MEHRAULI NEW DELHI-110017.

Email: ashishkumarandro@gmail.com

Hypertension is a substantially modifiable risk factor for Diabetes, cardiovascular morbidity, mortality and other complications. Age, sex, race, socioeconomic status, alcohol, smoking, lifestyle, genetics, nutrition, exposure to environmental agents etc. are the various factors triggering diabetes. Prevalence of Diabetes & its other co morbidities, risk factors was studied and quantified the pharmacoecconomical burden associated with Hypertension in a regional demographical area (Government hospitals and nearby localities) of Delhi NCR. A cross sectional survey was conducted among people (n=434) in Delhi NCR of different age groups (>18years) belonging to different areas. Written informed consent were obtained and subjects were made aware of the objective and procedure of the study. The mean age of Diabetic subjects was 51.23± 13.62 years. The prevalence rate of diabetes was 23.73% in hypertensive patients. Out of 262 Males and 172 Females, 47 (45.63%) males and 56 (54.36%) females were diabetic respectively. Metformin and Glimepiride was the most prescribed combination following DPP-4 inhibitors, Insulins, etc. The other fixed dose combinations prescribed for hypertension included β blockers (42.16%), CCBs (31.1%), AT 1 blockers (29.95%), ACE inhibitors (28.80%) and diuretics (23.5%). The overall medication and non-medication costs found out to be ₹ 957.5 and ₹ 367.34 per month respectively.

PB-67: NO-sGC-cGMP signaling influence the anxiolytic like effect of lithium in mice

VAIBHAV WALIA¹* MUNISH GARG²

1FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN 248009, UTTARAKHAND

2DEPARTMENT OF PHARMACEUTICAL SCIENCES, MAHARSHI DAYANAND UNIVERSITY, ROHTAK- 124001, HARYANA

Email: vaibhav.walia@dituniversity.edu.in

In this study, NO-sGC-cGMP signaling influence in the anxiolytic like effect of lithium was investigated. Lithium (50, 100 and 200 mg/kg, i.p.) was administered to the mice and the anxiety related behavior was determined using light and dark box (LDB) and elevated plus maze (EPM) methods. It was observed that lithium (100 mg/kg, i.p.) treatment reversed the anxiety related behavior and decreased the level of glutamate and nitrite in the brain of mice as compared to control. To determine the underlying role of nitric oxide (NO), sub-effective dose of lithium was administered in combination with NO donor i.e. L-Arginine (50 mg/kg, i.p.), NO and soluble guanylate cyclase (sGC) inhibitor i.e. methylene blue (1 mg/kg, i.p.) and phosphodiesterase inhibitor i.e. sildenafil (1 mg/kg, i.p.). The results obtained demonstrated that the anxiolytic like effect of lithium was abolished by the pretreatment with NO donor and potentiated by the pretreatment with NOS inhibitor. It was concluded that NO-sGC-cGMP pathway influenced the anxiolytic like effect of lithium in mice.

PB-68: Influence of gender difference in the antidepressant effect of fluoxetine in mice in tail suspension test

RIMSHA*, VAIBHAV WALIA

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN-248009, UTTARAKHAND

Email: rimshaashfaq016@gmail.com

To determine the effect of gender difference in the antidepressant effect of fluoxetine (FLX) in mice in tail suspension test (TST). Swiss albino mice of either sex were used and the depression-like behavior was measured by TST. The present study showed that the immobility period of the female mice was greater than the male mice. Further, the immobility period of FLX treated male mice was significantly lesser than the FLX treated female mice. It is concluded that the depression related behavior is more in female as compared to male. Further the antidepressant effect of FLX is more pronounced in male as compared to female.

PB-69: Anxiolytic-like effect of pyridoxine in mice by elevated plus maze and light and dark box

DISHA VERMA*, VAIBHAV WALIA

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN-248009, UTTARAKHAND.

Email: vdisha92@gmail.com

Present study was carried out to investigate the 'anxiolytic-like' effect of pyridoxine in mice. Pyridoxine (90, 180 and 360 mg/kg) was administered by intraperitoneal (i.p.) route to the experimental mice and anxiety-related behavior was evaluated by light and dark box (LDB) and elevated plus maze (EPM) models. Glutamate, GABA and nitrite levels were also



determined in the isolated whole brain of mice. It was observed that pyridoxine (180 mg/kg, i.p.) treatment increased the % time spent in the light compartment of LDB and open arm of EPM significantly as compared to control mice. Further pyridoxine (180 mg/kg, i.p.) treatment increased the level of GABA, but reduced the levels of nitrite and glutamate in the brain of mice significantly as compared to control. Thus, pyridoxine exerted anxiolytic like effect in mice by modulating the brain GABA, glutamate and nitrite level.

PB-70: Influence of stress and fluoxetine on immobility period of mice in tail suspension test and forced swim test

TANZILA*, VAIBHAV WALIA

FACULTY OF PHARMACY, DIT UNIVERSITY,
DEHRADUN-248009, UTTARAKHAND

Email: mehek1320@gmail.com

To investigate the influence of immobilization stress of 2 hrs and FLX on the immobility period of unstressed and stressed mice and to determine how stress and FLX modulates the effect of each other. Mice were stressed by immobilization for 2 hrs and the immobility period of both unstressed and stressed mice were determined by using tail suspension test (TST) and forced swim test (FST). Immobilization stress of 2 hrs increased the immobility period of mice in both TST and FST. FLX reduced the immobility period of both unstressed and stressed mice in both TST and FST. Both immobilization stress of 2 hrs

and FLX modulated the effect of each other. Immobility period of mice in which FLX was administered before the immobilization stress of 2 hrs had no significant difference from the immobility period of mice in which FLX was administered after the immobilization stress of 2 hrs. It has been concluded that the immobility period of mice in which FLX was administered before the immobilization stress of 2 hrs had no significant difference from the immobility period of mice in which FLX was administered after the immobilization stress of 2 hrs.

PB-71: Systematic Study of Pathophysiology and treatment of Diabetic retinopathy

QURESHI FATIMA*, REHMAN FAISAL,
MISHRA SHUBHAM, SINGH SIDDHARTH

FACULTY OF PHARMACY, DIT UNIVERSITY
DEHRADUN, UTTARAKHAND-248009

Email: Fatimaqureshi5908@gmail.com

The most prevalent complication of diabetes mellitus (DM) is diabetic retinopathy (DR). Diabetic retinopathy (DR) is a significant diabetes mellitus (DM) complication that continues to be a leading cause of visual loss in working-age populations. Clinical manifestations of vascular anomalies in the retina make the diagnosis of DR. Clinically, DR is split into two phases: non-proliferative retinopathy diabetes (NPDR) and proliferative retinopathy diabetes (PDR). NPDR is the early phase of DR in which enhanced vascular permeability and capillary occlusion are two primary retinal vasculature observations. During this phase, fundus

photography can detect retinal pathologies including microaneurysms, hemorrhages and difficult exudates, although patients may be asymptomatic. DR diagnosis is based on microvascular lesion identification. The introduction of antivascular endothelial growth factor (VEGF) treatment showed significant clinical advantages in patients with DR. However, most patients have not achieved significant visual enhancement in clinical terms. Therefore, the development of fresh medicines is urgently needed. Laboratory and clinical proof showed that inflammation and retinal neurodegeneration in the early phases of DR, in relation to microvascular modifications, can contribute to diabetic retinal damage. Further inquiry of the underlying molecular mechanisms may provide goals for fresh early intervention growth. The literature study consist of current knowledge and fresh perspectives into DR pathophysiology as well as clinical procedures for patients with DR.

Keywords: vascular pathology, inflammation, retinal degeneration, anti-VEGF, laser treatment

PB-72: Beneficial role of sodium orthovanadate in diabetic colon cancer

PATEL BM*, PATEL K

INSTITUTE OF PHARMACY, NIRMA
UNIVERSITY, S. G. HIGHWAY, CHHARODI,
AHMEDABAD-382481

Email: bgoyal@nirmauni.ac.in

The objective of the present study was to study the effects of sodium orthovanadate (SOV) in diabetic colon cancer. Disease was induced

by streptozotocin and 1,2 dimethylhydrazine in rats. Treatment was given for six weeks after disease induction. Disease control rats depicted hyperglycaemia, hyperinsulinaemia, elevated tumor burden and cancer biomarker levels. Treatment with SOV controlled hyperglycaemia, hyperinsulinaemia, reduced tumor burden and cancer biomarker levels. Immunohistochemistry of p53 gene showed that in disease control group, p53 gene was mutated and there was higher expression of E-cadherin and CD34 as compared to normal control group. Treatment with SOV showed uniformed p53 expression and reduced E-cadherin and CD34 expression. MTT assay, scratch assay, clonogenic assay and annexin V-FITC assay using flow cytometry were performed on HCT 15 cell line. Clonogenic assay showed that treatment of SOV causes decrease in colony formation potential. Rhodamine-123 dye assay showed that, live cells in control cell line were higher as compared to treated cells with SOV. Annexin V-FITC and propidium iodide staining showed the increased % of apoptosis in SOV treated cells. Chick Chorioallantoic Membrane assay showed that SOV causes anti-angiogenic effects in dose dependent manner. SOV exhibits tumor suppressive effect in diabetic colon cancer. SOV acts possibly by exhibiting anti-proliferative and anti-angiogenetic effects.

PC-01: Synthesis, Evaluation, Molecular Docking and Molecular dynamics studies of novel n-(4-(pyridin-2-yloxy) benzyl) Arylamine

derivatives as potential Antitubercular agents

VERMA R*, BOSHOF H, ARORA K, SHENOY G

MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES, MANIPAL- KARNATAKA 576104

E-mail: ruchi.verma@manipal.edu

Triclosan has been reported to inhibit InhA and thus inhibit fatty acid biosynthesis. Its role as an antitubercular agent is limited by its poor solubility and sub-optimal bioavailability. Objective: A new series of novel triclosan analogues were designed, synthesized and screened for its in-vitro antimycobacterial and antibacterial activity. Methodology: Thirteen novel molecules were synthesized, characterized and were further evaluated for antitubercular and antibacterial activity. In silico studies were carried out to explore the plausible mode of interactions of synthesized analogues with the target residues. Results and Discussion: Most of the compounds showed significant activity against Mycobacterium tuberculosis H37Rv strain with MIC values in 20-40 μ M range and also showed more significant activity against Bacillus subtilis and Staphylococcus aureus. The synthesized compounds showed druggable properties and the predicted ADME properties were within the acceptable limits. The in-silico studies predicted better interaction of compounds with target protein residues and higher dock score in comparison to triclosan. Molecular dynamics simulation study of compound 2i was performed in order to further explore the stability of the protein ligand complex and the protein ligand interaction in detail. Conclusion: Synthesized compounds were found to have further scope for structural

modifications and explore this moiety as potent antitubercular agents.

PC-02: Synthesis, Biological Evaluation of 2,3 -Disubstitutedimidazolyl/ Benzimidazolyl-quinazolin-4(3H)-one Derivatives

PATIL D*. A., DESHMUKH P. K., PATIL P. O., PATIL G. B.

H. R. PATEL INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH, KARWAND NAKA, SHIRPUR- MAHARASHTRA, 425405

E-mail: dilipapatil@gmail.com

A series of disubstituted-quinazolin-4(3H)-ones derivatives have been synthesized and confirmed through IR, ¹H- and ¹³C-NMR, MS spectroscopy and elemental analysis. Synthesized compounds were screened for in-vitro and in-vivo anti-inflammatory activity using human red blood cell membrane stabilization method and carrageenan-induced rat paw edema. The antimicrobial potency was measured by disk diffusion method. The compounds with imidazole (3g) and benzimidazole nucleus (4b and 4f) displayed a significant anti-inflammatory activity by in vitro method. Moreover, the compounds 3d and 4a exhibited a significant anti-inflammatory activity in-vivo. The compounds 3d, 3f and 4g were found to be active antimicrobial agents, when compared with reference drug ciprofloxacin and amphotericin-B. Thus, these compounds can serve as promising leads for further biological studies.



PC-03: Synthesized Pyrimidine Derivatives Showing Strong Anticancer Activity in Conjunction with other Biological Activities

CHAURASIA H S*, NAYAK A AND JAIN A P

R.K.D.F COLLEGE OF PHARMACY, SRK UNIVERSITY, BHOPAL- MADHYA PRADESH 462026

E-mail: hridaya03shankar@gmail.com

Pyrimidine is a heterocyclic aromatic organic compound containing two nitrogen atoms at positions 1 and 3 of the six-membered ring which shows wide range of biological activities. Numerous methods for the synthesis of pyrimidine and also their diverse reactions offer enormous scope in the field of medicinal chemistry. Novel functionalized pyrimidine, thiopyrimidine, iminopyrimidine derivatives and their derived bicyclic thiazolopyrimidine compounds have been showed wide biological activity. The synthesized compounds were studied for their anticancer activity against hepatocellular carcinoma HepG-2, human prostate adenocarcinoma PC-3 and human colorectal carcinoma HCT-116 cell lines. Pyrimidine derivatives also having anti-tubercular, antibacterial, antifungal, antiviral, anti-inflammatory, Antimalarial, anti-HIV activity. The present review attempts to give brief information about the synthesis and various biological activities of pyrimidines and their derivatives.

PC-04: Biologically active heterocyclic nucleus: Triazine

MEGHANI MONIKA*, KAUSHIK PEEHUL, SINGH GURVINDER

KOTA COLLEGE OF PHARMACY, RANPUR – RAJASTHAN-325003

E-mail: Monikameghani1998@gmail.com

Among all heterocyclic compounds, the triazine nucleus have been increasingly studied in previous years due to which it occupies a remarkable position. The triazine nucleus possesses a broad range of biological activities. Triazine is an attractive nucleus for the design and development of new drugs because it is found in many potent biologically active molecules with promising biological potential like anti-inflammatory, anti-mycobacterial, anti-viral, anti-cancer, antileishmanial, antiamebic etc. This nucleus has attracted attention in the field of medicinal chemistry due to the wide spectrum of biological activities. The structure activity relationship of this nucleus has generated interest among medicinal chemists because of its various biological activities and this has concluded in the discovery of several lead molecules. Within a very short period of time, the outstanding development of triazine nucleus in various diseases proves its magnitude for medicinal chemistry research. Therefore, these compounds have been synthesized by many researchers as target structure and were further screened for their biological activities. In this updated review, we have compiled and discussed the biological potential of triazine nucleus and its derivatives, which could provide an important information of the triazine derived compounds

to a medicinal chemist for the development of clinically viable drugs.

PC-05: Role of Hydrotropic Method for Eco-Friendly UV Spectrophotometric Analytical Development

JIRVANKAR PRANITA*, LOHIYA R, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: pjirvankar123@gmail.com

Aim of present study was development of UV Spectrophotometric analytical methods for drugs and there formulation by hydrotropy. Determinations of poorly water insoluble drugs usually involve use of organic solvents. Hence to avoid this excessive use of organic solvents along with development of green eco-friendly analytical methods, concepts of Hydrotropic solubilisation, mixed Hydrotropy, mixed solvency are used to increased water solubility of drugs. Methods use various hydrotrope, a compound that solubilises hydrophobic compounds in aqueous solution. Hydrotropic solutions possess high industrial demand due to their unique features such as easy availability, good recovery, absence of fire hazards, higher separation factors without any solutes emulsification problem and eco-friendly in nature. Concentrated aqueous solutions of sodium benzoate, sodium salicylate, urea, and Nicotinamide, sodium citrate, and sodium acetate and sodium ascorbate have been employed to enhance the aqueous solubility of

a large number of poorly water soluble drugs and can be used for determination of these drugs without interference in absorbance at proper wavelength. Solubility is one of the most important characteristics of a drug and can be enhanced by different solubilization techniques among which Hydrotropy technique has boosted its use in various operational fields by adding a second solute which results in aqueous solubility of another solute.

PC-06: Synthesis, Characterization and Biological Evaluation of 2, 5-Substituted Benzimidazole Derivatives

PAL GURWINDER*, SINGH VINEET KUMAR, BODLA RB

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH (DPSAR), NEW DELHI-110017

Email: sharmagurwinder97@gmail.com

Benzimidazole nucleus is a constituent of many heterocyclic aromatic compounds having a wide range of biological activities. The objective of the study is to synthesize 2,5 substituted benzimidazole derivatives. In this present study, 19 benzimidazole derivatives were synthesized by reacting 5-substituted-o-phenylenediamine as primary reactant with different aromatic carboxylic acid and aromatic aldehydes. The anti bacterial and anti fungal activity was performed by cup plate method using different gram +ve and gram -ve bacteria. The in vitro anti oxidant activity was determined by ABTS

and DPPH method. Evaluation of in vitro anti inflammatory activity was performed by inhibition of protein denaturation method. The results showed that structures were confirmed with the help of Melting Point, UV, IR, ¹H NMR. The promising anti microbial activity observed in BNZ 1, BNZ 2, BNZ 3, BNZ 9, BNZ 10, BNZ 13 and BNZ 14. Anti oxidant activity was maximum in BNZ 1, BNZ 3, BNZ 9, BNZ 10 (for DPPH) and BNZ 1, BNZ 2, BNZ 3, BNZ 16, BNZ 17 (for ABTS). Synthetic compounds BNZ 1, BNZ 7, BNZ 9, BNZ 11, BNZ 12, BNZ 14, BNZ 16, BNZ 18 shows excellent anti inflammatory activity.

PC-07: Synthesis, Characterization and Evaluation of Biological Potential of Substituted Apigenin Derivative

DESHMUKH SHYAM R*, SAWARKAR S, GUPTA K, KABRA U, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA-441002

Email: deshmukh.shyam611@gmail.com

The present work describes the synthesis of substituted piperazine of fluoro analog of Apigenin. The molecular modification approach was used to enhance the ADME property and solubility of Apigenin. The synthesis of fluoro analog of Apigenin carryout by benzylation and the second step is a Baker-Venkataraman rearrangement to provide the b-diketone, which upon treatment with

acid leads to cyclization to form the fluoro analog of apigenin. The chemical structures of the substituted piperazine of fluoro analog of Apigenin were confirmed by using ¹H NMR, ¹³C NMR, mass spectroscopy and FTIR. The log P (partition coefficient) of all compound shows increasing the lipophilicity due to attachment of 4'carbon spacer at 7th hydroxyl group of fluoro analog of Apigenin and substituted piperazines. The anti-oxidant activity and anti-microbial activity shows good results. The antiproliferative activity of the substituted piperazines of fluoro analog of Apigenin was evaluated by an MIT assay. All the compound displayed better growth inhibition activity against human breast (MCF-7) cancer cells, than the parent Apigenin.

PC-08: Development of HPTLC Method for Quantitative Estimation of Levocloperastine Fendizoate in Bulk and its Suspension

RABADE SHEEPALI K*, JAIN N, UMEKAR M, LOHIYA R

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA-441002

Email: shefalirabade28@gmail.com

The aim of present work is to develop a new, simple, specific and economic HPTLC method for quantitative estimation of Levocloperastine (LCP) Fendizoate in bulk and its suspension. The chromatographic separation was carried out on Merck pre-coated aluminium sheet with

Silica Gel 60 F254 using a mixture of Toluene: Ethyl acetate: Glacial acetic acid (6:1:0.3 % v:v:v) as the mobile phase and densitogram evaluation of spots was carried out at 285 nm using Camag HPTLC System with Linomat IV Sample applicator and TLC Scanner 3 with winCATS software. The method was validated for accuracy, precision, linearity, stability, specificity and Ruggedness. The R_f value 0.37 was observed for LCP. LCP showed good correlation coefficient $r^2 = 0.9916$ for LCP in given concentration range 5-13 ng/spot for LCP. The method was successfully applied to the analysis of the drug in bulk and its suspension. The result obtained by HPTLC method for determination of Levocloperastine Fendizoate are reliable, accurate and precise. The method does not have any interference of excipient while determining from their formulation. Hence, it can be employed for routine quality control analysis in LCP in suspension.

PC-09: Synthesis, Formulation and Validation of Prussian Blue: A Competent Approach for Decorporation of Radionuclides

MANOCHA PURNIMA*, MITTAL P, PATHAK D, SANDAL N

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH (DIPSAR), NEW DELHI-110017

Email: purnimamanocha27@gmail.com

Decorporating agent Prussian Blue was

synthesized from ferric chloride (FeCl₃) and potassium ferrocyanide (K₄[Fe(CN)₆]) and was formulated into a capsule with two types of granules as a potent absorbent for the decontamination of radionuclides (Cs, Tl) absorbed in the body by complex formation. Prussian blue granules were prepared by wet granulation method. Prussian Blue formulations were validated by UV-spectroscopy and were checked for their linearity, LOD, LOQ etc. The validated formulations of Prussian Blue were evaluated for FTIR studies, adsorption studies, stability and specificity. The final formulations were then tested for their binding efficiency. Prussian Blue was made soluble for UV analysis by reacting with 4N NaOH and conc. H₂SO₄, max was obtained at 710nm. The drug shows linearity within the range of 0.1-100 µg/ml with r^2 of 0.9992. The LOD and LOQ of the proposed method were found to be 0.19µg/ml and 2.55µg/ml indicating that the method developed was sensitive. The IR spectral analyses suggested that there was no interaction between the drug and pH modifiers. Absorption of Cesium and Thallium increases with the increase in concentration of Prussian Blue and shows maximum absorption at 100mg. It also increases with the increase in pH maximum seen at pH 6.7 with Na₂CO₃ and is also affected by medium as it is more in water than GSF as water has a pH between 6-7 while that of GSF is 1.5-2.

Keywords: Decorporating Agent, Prussian blue, pH modifier, LOD, LOQ

PC-10: Design, Synthesis, Molecular Modeling, Docking and in-vitro Study

of Somatostatin Receptor (SSTR) Analogs

BEHERA ASHOK*

CSIR-IICB KOLKATA & FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN-UTTARAKHAND-248009

Email: ashok.behera@dituniversity.edu.in

Somatostatin (SST) is a hormone which primary function is inhibition of hormone secretion. Somatostatin receptor (SSTR) subtypes 1-5 are overexpressed in neuro endocrine tumors (NETs), and SSTR2 is the one most expressed, making it a feasible target for directed radionuclide therapy. By designing a radiolabelled SST analog able to bind to the receptor, a ligand for diagnostification and therapy can be constructed. The ligand can be optimised in terms of affinity toward the receptor, the half-life in the body, pharmacokinetics etc. This project aims at designing a ligand with a higher affinity than existing ligands. Octreotide is the SST analog with the highest affinity toward SSTR2, it will be used as standard ligand template in the modelling of novel analogs. I-Tasser (Zhang server) is used for modeling of SSTR2. HYNIC-Phe3-Octreotide, HYNIC-Tyr3-Octreotide, HYNIC-His3-Octreotate, HYNIC-Met3-Octreotate were designed and minimized energy using MM2 Chem 3D pro softwear. Docking study was performed using Auto dock vina software.

PC-11: Synthesis and Biological Evaluation of New Chromenone Derivatives

against Alzheimer's Disease

TONKA RAJIV K*, UMAA

**DELHI INSTITUTE OF PHARMACEUTICAL
SCIENCES AND RESEARCH UNIVERSITY
(DPSRU), NEW DELHI-110017**

Email: uma5194@gmail.com

Chromenone is aromatic organic chemical compound in the benzopyrone chemical class. The natural and synthetic chromenone shows diversify pharmacological actions such as anti-coagulant, anti-fungal, anti-viral and anti-mutagenic action. Chromenones have also attracted lots of attention as AChEIs. They have been found as a crucial scaffold for the optimal AChEI. Therefore the synthesis of novel synthetic and semi-synthetic chromenones fused with heterocycles inhibits plaque contain beta amyloid and gene mutation in brain. . A convenient 3-4 step method used for the synthesis of synthetic compounds. The synthesized compound was characterized by Attenuated total reflection (ATR), Proton Nuclear Magnetic Resonance (1H-NMR) and Carbon-13 nuclear magnetic resonance (13C-NMR). All novel synthesized compounds were screened for in-vitro and in-vivo anti-alzheimer activity.

PC-12: Natural Product as a Hit Discovery

**GAYATRI KUMARI*,MEGHA, HIMANSHI
MEHRAULI - BADARPUR RD, SECTOR 3, PUSH
VIHAR, NEW DELHI, DELHI 110017**

Email: 987kumarigayatri@gmail.com

NMR spectroscopy now-a-days proving as 1st line analytical tool in discovery of hits

from natural products at academics as well as industrial level. The role of 1H and 13C NMR spectroscopy is summarized with its wide application in isolated compounds screening obtained from natural sources. The recent modifications of NMR spectroscopy (micro NMR spectroscopy, cryprobe technologies, hyphenated LC-NMR-MS systems, etc.) which is enhancing the scope of characterization of isolated compounds. This covers NMR application in structural elucidation, stereo chemical properties studies, pharmacophore receptor binding studies and screening of natural products extracts. Dereplication & natural products NMR databases are also available. The collaboration of industries with academics can promote discovery of hits as potential drugs in the market.

PC-13: Pyrimidine-2-thione analogues as potential antibacterial and anti-fungal agents

**CHATURVEDI VARUNESH *, ANSARI
AADIL, SHARMA ABHAY, NAGAR
JAGDISH**

**KOTA COLLEGE OF PHARMACY, RANPUR,
JHALAWAR ROAD, KOTA- 325003, RAJASTHAN**

Email: varunchaturvedi1900@gmail.com

A series of dihydropyrimidine derivatives were synthesized and evaluated for antibacterial activity against *S. aureus*, *B. subtilis*, and *E. coli* and antifungal activity *Candida albicans*, *A. flavus* and *A. niger* by adopting standard protocol. Among them, compounds 4d, 4g & 4h have shown promising antibacterial activity and compound no. 4c 4e & 4f have shown

potent anti-fungal activities. Rests of the compound have shown moderate antibacterial and antifungal activities. Molecular vibration analyses of two biochemically important molecules namely pyridine-2-thione and pyrimidine-2-thione have been made for all the fundamentals employing the Urey-Bradley potential function supplemented with valence force function for out of plane vibrations.

PC-14: Design, synthesis, and biological evaluation of novel 2, n6-disubstituted 1,2-dihydro-1,3,5-triazine- 4,6-diamines as potential anti-malaria agent

**MISHRA PRIYANKA*, PUROHIT P,
SHEIKH AS**

**SWAMI KESHVANAND INSTITUTE OF
PHARMACY, BIKANER-334022, RAJASTHAN**

Email: mishra.priyanka0412@gmail.com

Malaria is a mosquito borne protozoan disease and a major cause of concern to human health. Severe disease is largely caused by *Plasmodium falciparum*. The DHFR domain of *Plasmodium falciparum* (bifunctional dihydrofolate reductase – thymidylate synthase) is one of the few well defined targets of malaria chemotherapy. In this paper a series of novel 2, N 6 – disubstituted 1,2 dihydro – 1,3,5 triazine – 4,6 – diamines were prepared using microwave assisted organic synthesis and its potential as anti-malarial agents was assessed. The compounds were evaluated in vitro by schizont inhibition method assay



against cycloquanil – resistant FCK2 strain of *Plasmodium falciparum*

PC-15: Anti-inflammatory drugs in Alzheimer's disease: A preclinical analysis.

SHRADDHA M GUPTA^{1*}, SUSHIL K CHAUDHARY², NEETESH K JAIN²

FACULTY OF PHARMACY, DIT UNIVERSITY, DEHRADUN-248009, UTTARAKHAND
2 FACULTY OF PHARMACY, ORIENTAL UNIVERSITY, INDORE-MADHYA PRADESH-453555,

E-mail: Shraddha.27981@gmail.com

Alzheimer's disease (AD) is a prime and increasing burden on families, communities, and national health budgets. AD is a complex neurodegenerative disorder and this suggests that deposition of amyloid- β , accumulation of τ -protein, release of inflammatory mediators and decreasing level of acetylcholine in the cholinergic system could be the possible reason for enhancing neurodegenerative condition of the AD brain. A limiting factor for rapid progress in research on AD has been the small number of animal models of the disease. To bridge the wide gap between the molecular biology of AD and clinical therapeutics, it is essential to have valid non-human animal models to investigate disease mechanisms, test treatments, and evaluate preventative strategies and cures. Thus, new treatment strategies need to be developed, because of the limited effectiveness of the current therapies. The current study included electronic databases such as PubMed, Web of Science and Scopus. A large number of in-vivo and in-vitro models have been presented for evaluating the

mechanism of anti-inflammatory drugs against AD. This critique comprehends the extensive pathophysiological and molecular mechanisms associated with AD, mainly focusing on the challenges associated with the evaluation and predictive validation of these models. This assessment may further contribute to discover a novel drug to treat AD with lesser side effect.

PC-16: Synthesis and biological evaluation of some benzoxazoline ring

SARIKA DEVI^{*}, DR. PRAVEEN KUMAR, RITU SAINI

QUANTUM SCHOOL OF HEALTH SCIENCE, QUANTUM UNIVERSITY, ROORKEE

E-mail: sarikasaini1991@gmail.com

The aim of the present study was to synthesize two benzoxazoline rings and screened for their antimicrobial activity and compared to standard drug. The two benzoxazoline ring were synthesized namely, 2- (2- hydroxyl benzyl) benzoxazoline (A1) and 2- (4- hydroxyl benzyl) benzoxazoline (A2). The title compound (A1) was obtained by the reaction of phosphoric pentoxide and Ortho-phosphoric acid afforded polyphosphoric acid, which react with 2-aminophenol and salicylic acid afforded 2-(2 hydroxyphenyl) benzoxazole, on further reaction with Sodium borohydride dissolved in methanol gave 2- (2- hydroxyl benzyl) benzoxazoline and polyphosphoric acid was react with 2-aminophenol and 4-hydroxybenzoic acid afforded 2-(4 hydroxyphenyl) benzoxazole, on further reaction with Sodium borohydride dissolved in methanol gave 2- (4- hydroxyl

benzyl) benzoxazoline. The structures of target compounds (A1-A2) were established on the basis of infrared spectral analysis. Target compounds (A1-A2) were screened for their antimicrobial activity and showing significant antimicrobial activity as compared to standard drug. The benzoxazoline rings were synthesized according to scheme and calculated its percentage yield. Structures of synthesized compounds were confirmed by IR spectroscopy. These compounds were evaluated for their in-vitro antibacterial activity against both Gram-positive (*B. subtilis*) and Gram-negative bacteria (*E. coli*) using ciprofloxacin as standard drugs in concentration of 50 $\mu\text{g/ml}$ and 100 mg/ml and shows compound A-2 showed maximum zone of inhibition 19 mm against *E. coli* (ESS 2231) and 16 mm against *B. subtilis* (MT).

Key words: Antimicrobial activity, Benzoxazoline ring, Polyphosphoric acid

PC-17: Formulation and Evaluation of Nanoemulsion Based Transdermal Patch of Curcumin

BARSAGADE PRACHI^{*}, GIRI NEHA, RAUT NEHA, UMEKAR MILIND

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: prachibarsagade398@gmail.com

Aim of present study was to formulate nanoemulsion based transdermal patches of curcumin to enhance the solubility of curcumin and permeability through biological membrane. A curcumin was characterized for

the UV Spectrophotometric analysis, FTIR, DSC, Solubility studies, and HPLC analysis. A nanoemulsion was prepared by the high pressure homogenization method using an castor oil, tween 80 and polyethylene glycol 400 and were evaluated for globule size, particle size, zeta potential, stability, pH determination, drug content and Ex-vivo skin permeation study. From the prepared nanoemulsion, different patches were prepared on the film former. Curcumin in a nanoemulsion was found to be more stable than free curcumin. FTIR spectrum of curcumin exhibited the absorption bands 3502.31, 1625.64, 1601.78, 1427.26, 1231.54 cm⁻¹ assigned to -OH, C=O, aromatic C=O, phenol, enol stretching respectively confirms curcumin structure. The DSC curve of curcumin indicated sharp endothermic curve indicated melting point of curcumin. The zeta potential of the system which indicated the decrease in droplet size in base of nanoemulsion i.e., -22.6mV. Moreover, the developed nanoemulsion based transdermal system of curcumin showed improved solubility and permeability in comparison with plain curcumin. The developed nanoemulsion-based transdermal patches of curcumin have skin permeation for topical drug delivery and may be useful for the treatment of skin diseases.

PC-18: Application of Chemical Methods for Solubility Enhancement and Pharmacokinetic Assessment of Drug in Blood Plasma by HPLC

POUNIKAR A*, GAUTAM A, GUPTA K, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA-441002

Email: anurajpounikar16@gmail.com

Aim of present study was to increase water solubility, dissolution and bioavailability of Lamotrigine, a low water soluble drug by preparing Lamotrigine drug complexes with β -Cyclodextrin, Caffeine, Nicotinamide and EDTA. Physical mixture, kneading and Solvent evaporation methods were used to prepare Lamotrigine complexes from which solvent evaporation method was found to be best method. The interaction of Lamotrigine with these hydrophilic complexing agents was characterized by UV, IR, PXRD and DSC. In vitro dissolution study revealed that all the complexes showed improved drug release of Lamotrigine from its complexes. A reverse phase HPLC method was developed for the investigation of Lamotrigine in rat plasma using internal standard method after oral administration of Lamotrigine and its complexes. The method was successfully applied for the pharmacokinetic study in rat. Lamotrigine and its prepared complexes with β -Cyclodextrin, Caffeine, Nicotinamide and EDTA concentration in blood plasma (C_{max}) were found to be 19.4732, 48.4876, 72.2160, 62.2739 and 49.3170 μ g/mL at T_{max} of 5 h respectively. Lamotrigine complexes β -Cyclodextrin, Caffeine, Nicotinamide and EDTA showed 4 to 5 time enhancement of C_{max}. The results demonstrated that complexes of Lamotrigine were successful strategy to improve the solubility and dissolution behavior of Lamotrigine.

PC-19: Development and Validation of UV-Spectrophotometric and HPLC Method Determination of Drug in Formulation

PARSHURAMKAR Y*, DHURVE H, GUPTA K, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA-441002

Email: yasminiparshuramkar@gmail.com

The aim of the present work is the development of a new, simple, specific and economic UV Spectrophotometric method and HPLC method for the estimation of Dofetilide content in bulk and laboratory prepared mixture. The UV spectrophotometric detection was carried out at absorption maxima (λ_{max}) at 231 nm using methanol as a solvent. The quantitation of drug was carried out using A1% 1cm and Beer's law was obeyed in the concentration range of 2-10 μ g/mL. The chromatographic separation was carried on a Phenomenex C-18 (250 mm $\times$ 4.6 mm, 5 μ) column using an isocratic mode with a mixture of Acetonitrile:Phosphate Buffer (pH-7) in the ratio of 55:45% v/v as a mobile phase. The flow rate was 1.5ml/min, temperature is maintained at ambient and detection was made at 231 nm using Photodiode array (PDA) detector. The developed method was validated according to the ICH guidelines and different analytical parameters such as linearity, precision, accuracy, specificity, limit of detection, limit of quantitation

were determined. The proposed method was validated for its accuracy, precision, ruggedness, robustness, linearity, limit of detection, limit of quantitation and was found to be in ranges. The both method was validated and found to be simple, sensitive, accurate, and precise. The results of the study proved the applicability of the present method in routine analysis of Dofetilide in bulk as well as in the formulation.

PC-20: Biological actions of mulberry and its recent advancements

YADAV SONAM*

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH (DIPSAR), NEW DELHI-110017

Email: yadavsonam851@gmail.com

Morus alba, Morus species of the family Moraceae is being utilized as a medicinal plant because of its chemical composition and pharmacological functions. Mulberry plays a vital role in Hypoglycemic activity, anti-obesity action, lipid-lowering action, antioxidants and anti-inflammatory actions, neuroprotective action and anticancer action. We have studied the recent advances and comprehensive information on the uses and pharmacological activities of Mulberry species. All the information about mulberry is collected through multiple internet databases, including Elsevier, Science Direct, PubMed, ACS Publications, SciFinder, Google Scholar and number of books. The pharmacology of Chinese herbs by KEE CHANG HUANG was also used as reference. Keywords: Mulberry,

antioxidant action, anti-inflammatory action, anti-obesity action, hypoglycaemic action, anticancer action.

PC-21: Effect of carbamazepine and valproate on lipid profile in epileptics

SAREEN SHUBHAM*

SARDAR PATEL MEDICAL COLLEGE, BIKANER, RAJASTHAN - 334001

E-mail: shubhs16@gmail.com

Epilepsy is a chronic neurological disorder requiring long term treatment with anti-epileptic drugs (AED's) which results in biochemical changes due to enzyme inducing effect of AED's. Increase in serum cholesterol and triglycerides due to older AED's like carbamazepine and phenytoin is reported by many studies. Since, most epileptic patients are of younger age group, an early and rapid start of atherosclerosis in them will have adverse cardiovascular impact later in life. However, conflicting results are reported on effect of serum lipid profile by sodium valproate when compared to other older AED's like carbamazepine. Materials and Methods: A prospective study was done on 40 new epilepsy patients prescribed valproate and carbamazepine monotherapy. Blood samples were collected before starting drugs and repeated after 4 months of drug treatment. Samples were also taken from 40 healthy controls. Lipid profile was analysed on Beckman-Coulter analyser. t test was used for statistical analysis. Results: Total Cholesterol and LDL cholesterol were significantly higher ($p < 0.05$) after 4 months of carbamazepine use in

epilepsy patients and not significantly high in patients on valproate. Triglyceride levels though raised, were not statistically significant ($p > 0.05$) in both the groups. Conclusion: Adverse impact on serum lipid level occurs due to long term use of carbamazepine. Regular monitoring of lipid profile should therefore be done in patients on carbamazepine.

PC-22: RP-HPLC Method Development and Validation for the Simultaneous Estimation of Serratiopeptidase, Aceclofenac and Paracetamol

PATEL ANSHUL*, KASHAW VARSHA

SAGAR INSTITUTE OF PHARMACEUTICAL SCIENCES, SAGAR, MADHYA PRADESH, INDIA

E-mail address: anshulpatel2296@gmail.com

RP-HPLC method was developed and validated for concurrent simultaneous estimation of Serratiopeptidase (SERA), Aceclofenac (ACE) and Paracetamol (PCM) in combined tablet dosage form. The present study revealed using cheap and cost effective solvent system for the simultaneous estimation of SERA, ACE and PCM. A stable, linear, rapid, accurate and selective RP-HPLC method has been developed for all three drugs at the wavelength 327 nm, flow rate 1 mL/min and the mobile phase was used water: methanol in the ratio (30:70 v/v). Validation parameters such as system suitability, linearity, accuracy, precision, specificity, LOD, LOQ and robustness were

taken into account to carry out the validation of the method. Absorbance maxima for the simultaneous determination were selected by the UV spectrophotometer and that was found to be 327 nm in methanol and water. During the process of RP-HPLC, the linearity was obtained in the concentration range of 2-20 µg/mL for SERA, 100-500 µg/mL for ACE and 20-100 µg/mL for PCM. Correlation coefficient (r) for SERA, ACE and PCM in methanol and water was found to be 0.9817, 0.991 and 0.9949 respectively. The RP-HPLC method was simple, accurate, precise, and rapid and can be used for the simultaneous determination of SERA, ACE and PCM in bulk and pharmaceutical dosage form.

Keywords: Aceclofenac; coefficient; Paracetamol; Pharmaceutical dosage; RP-HPLC; Simultaneous estimation; Validation

PC-23: HPLC Method development and validation: Simultaneous determination of Flibanserin and Caffeine

POORNIMA SHARMA*, SHARAD WAKODE

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCE AND RESEARCH (DIPSAR) NEW DELHI, INDIA

E-mail: shpoornima07@rediffmail.com

Flibanserin is a serotonergic antidepressant drug used to treat hypoactive sexual desire disorder. It is a serotonergic mixed agonist and antagonist that was initially developed as an antidepressant, it was found to have possible effects on sexual desire and drive. Surprisingly, it has been found that it is possible to combine flibanserin with caffeine

to significantly reduce the described side effect (sedation) to a minimum and at the same time increasing the efficacy of the treatment. Here we develop a method for flibanserin and caffeine however there is no such reported method. The simple, fast and sensitive RP-HPLC method was developed for simultaneous determination of Flibanserin and caffeine. The High-performance liquid chromatography is a form of chromatography that pumps the sample mixture or analyte in a solvent at high pressure through a column Using C18 column and a gradient elution system of buffer and ACN, the compounds caffeine and flibanserin were eluted at RT 2 and 5 min in total 10 min run time.. The method was validated as per ICH guidelines for specificity, linearity, range, accuracy, precision, LOD, LOQ, robustness and system suitability testing.

Keywords: HPLC, flibanserin, caffeine, validation, method.

PC-24: Regulatory Issues in Nutraceuticals and Ayush Drugs

BAJWAN RAJAT*, GUPTA PARAS, SINGH BHARGAVI, KUMAR ASHISH

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH UNIVERSITY (DPSRU), NEW DELHI-110017

Email: bajwanr@gmail.com

Alternative the medicines the nutraceuticals and herbal drugs are widely used for the treatment. Nutraceuticals are the concentrated nutrients that are isolated from food or food products and have therapeutic and preventive qualities. AYUSH medicines (Ayurveda, yoga and naturopathy, Unani, siddha, homoeopathy system) are used in India for the treatment.

Herbal products includes functional food, dietary supplements and traditional or folk medicines. Herbal medicines and nutraceuticals are becoming very popular because of in herbal drugs contains high efficiency, low toxicity and side effects, cheap and locally available. But the Abasement of herbal drug standardization, information procedure, and quality control are the mainly omission for the development of herbal treatment. In recent years regulatory and promotional approaches are used to overcome such problems likes Quality control, rigorous research to evaluate the effectiveness and safety, clinical trials of the herbal products are required. But the isolation techniques for desire molecules have not developed for the traditional of folk herbal drugs because of absence of research facilities and market demand.

PC-25: Pharmacognostical Study, Phytochemical Evaluation and in-vitro Pharmacological Activity of Leaves and Bark Extracts of Plumeria Obtusa Linn

SINGH BHARGAVI*, BAJWAN RAJAT, VYAS MANJU

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH UNIVERSITY, NEW DELHI-110017

Email: bhargavisinh95@gmail.com

Plumeria obtusa Linn. flower is a shrub belonging to family Apocynaceae. Locally it is called as a Frangipani or Champa. 47 components were identified, representing 97% of the oil, with benzyl salicylate (49%),

benzyl benzoate (11%), (2E, 6E) – farnesol (8%) and (E)-nerolidol (5%) as major constituent. Regarding anti-microbial activity, the extracts showed variable degrees of inhibition of all microorganisms. Among gram positive bacteria, the most susceptible was *B. subtilis* and the most resistant was *S. aureus*. Among gram negative, the most susceptible was *Erwinia carotovora*, the most resistant *P. aeruginosa*. The anti-oxidant potential of a methanol extract and fractions of *P. obtusa* leaf has shown moderate dose-dependent antioxidant activity based on DPPH and lipid peroxidation inhibition assay. The insecticidal efficacy of *P. obtusa* yielded mosquito mortality rate of 86.2% and weevil mortality of 90% respectively suggesting potential applications in public health pest and disease management. The methanolic extracts of *P. obtusa* stem bark were shown to be effective in increasing the healing of gastric ulcers induced by pylorus ligation, indomethacin in Wistar rats. On the basis of results obtained, *P. obtusa* leaf and bark possess significant antidiabetic, inflammatory, antioxidant, anthelmintic and antimicrobial activity. These activities may be due to the presence of phytoconstituents like alkaloids, flavonoids, triterpenoids etc.

Keywords: *Plumeria obtusa*, insecticidal

PC-26: Anti Inflammatory Activity of Roots of Asteracantha Longifolia

YADAV AASTHA SUNIL*, RAUT P, HEMKE A, UMEKAR M.

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, NAGPUR, MAHARASHTRA-441002

Email: aasthaydv16@gmail.com

Herbal medicines are safer than synthetic

medicines because the phytochemical present in the plant extract target the biochemical pathway have the non – toxic, less side effect and easily available. *Asteracantha Longifolia* is also known as *Hygrophila schulli*. The aerial parts of this plant have been attributed with anti – inflammatory and analgesic properties in the folklore medicine. It is a wild herb commonly found in moist places on the banks of rivers, ditches and paddy fields throughout India. It is classified in the Ayurvedic system of medicine and is used for the treatment of a number of conditions including premecham (diabetes) and athisaram (dysentery). The activity due to the strong occurrence of polyphenolic compounds such as sterols i.e. β sitosterol. In present study anti-inflammatory properties of the roots extract of *A. Longifolia* was evaluated. In this study, *A. Longifolia* roots were extracted with ethanol and carrageenan-induced paw edema test were used to screen the anti-inflammatory action of the roots. The results obtained clearly indicated that *A. Longifolia* roots extract have the ability to decrease the carrageenan-induced foot paw edema. *A. Longifolia* plant aerial parts showed various pharmacological activity but its root extracts also possess anti-inflammatory activity.

Keywords: *Asteracantha Longifolia*, *hygrophila schulli*, athisaram, premecham, ayurvedic, sitosterol

PC-27: Formulation and In-Vitro Evaluation of Fast Dissolving Tablet of Paracetamol using 32 Factorial Design

DANGORE CHAITALI KAILAS*,

WADHER K, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, NAGPUR, MAHARASHTRA-441002

Email: dangorechaitu1997@gmail.com

The aim of present study was to carry out formulation and evaluation of fast dissolving tablets of paracetamol 32 factorial design. Fast dissolving tablets of Paracetamol were prepared by direct compression method using 32 factorial design using various concentrations of superdisintegrants like croscarmellose sodium and Sodium starch glycolate. The prepared tablets were evaluated for weight variation, hardness, thickness, friability, disintegration time, drug content and dissolution rate study. Prepared fast dissolving paracetamol tablet was evaluated like hardness, friability, weight variation and drug content indicate that values were within permissible limit for all formulations. Disintegration time for all the formulations were found to be in the range of 48-110 sec. The friability was less than 1%. The wetting time and disintegration time were practically good for all formulations. In vitro drug release study was carried out and based on the results batch F7 containing higher percentage of croscarmellose sodium was identified as the optimized formulation among all the other formulations. The results showed that with increasing the concentration of superdisintegrants the disintegration time decreases and the release of the drug increases. Among the superdisintegrant croscarmellose sodium gave rapid disintegration of the tablets.

Keywords: Fast Dissolving Tablet, Paracetamol, Direct compression

PC-28: Formulation and Evaluation of Nanoparticles of Plant Herbal Extracts

Containing Phytosterols and its Cytotoxic Effect

KAMBLE NIDHITA S*, BIRE P, UMEKAR M, DURAGKAR N

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, NAGPUR, MAHARASHTRA-441002

Email: nidhitakamble97@gmail.com

Aim of present study was to evaluate phytosterols containing nanoparticles for the cytotoxic activity. The extraction process of *Trigonella foenum*, *Coleus forskohli*, and *Dioscorea bulbifera*, were carried out in petroleum ether by 60-80°C using soxhlet apparatus. The presence of sterols in the extract of three drugs was confirmed by performing preliminary phytochemical screening it give positive lab test and purity of compound was confirmed by thin layer chromatography, column chromatography, and also spectroscopic analysis such as UV visible spectroscopy and FTIR. The isolated compound obtained was subjected to high pressure homogenizer for the synthesis of nanoparticles. The results obtained from present work indicated that the anticancer activity was studied, which include antimitotic activity, antiproliferative activity and Cell line study. The in-vitro studies were carried out by using Franze diffusion cell and in-vivo studies were tested on the rat abdominal skin. The anti-proliferative activities of combination of these drugs have shown maximum growth inhibition of yeast cells. The formulation of gel was found to be stable with respect to its physical appearance, % viscosity, % Spreadability, and drug content. These results from the above studies confirmed that the particle size of combination was in optimum range the in-vivo and in-vitro studies

explain that the above formulation can be utilized for the treatment of breast cancer.

PC-29: Formulation and Evaluation of Solid Dispersion to Enhance the Solubility of Anti-Hyperlipidemic Drug

SAMRIT SHRADDHA R*, TRIPURNENI S R, DUDHEKAR R G, TRIVEDI R V, UMEKAR M J

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, NAGPUR, MAHARASHTRA-441002

Email: ssamrit70@gmail.com

The aim of the present study was to improve the solubility and dissolution rate of a poorly water-soluble drug Rosuvastatin and Ezetimibe by formulating Solid dispersions. The solid dispersion of Rosuvastatin and Ezetimibe were characterized by DSC, XRD and FTIR spectroscopy. Further solid dispersion of both the drugs were compressed with excipients to form conventional tablet and evaluate the pre compression parameters such as Angle of repose, Bulk density, Tapped density and compressibility index and post compression parameters such as Hardness, Friability, Weight variation, Content uniformity, Disintegration and in vitro Dissolution. From the characterization FTIR, DSC, PXRD, Solubility and In vitro dissolution testing both the solid dispersion showed maximum % release. Evaluation of powder blend for pre compression parameters and Post compressions parameters of Rosuvastatin and ezetimibe oral conventional tablets showed the maximum

release. The combination tablet of RVT and EZE shows maximum % release in vitro dissolution. The result shows that solid dispersion of RVT in ratio 1:2 using dichloromethane and EZE in ratio 1:3 using ethanol showed significant increase in solubility and dissolution which may increase the bioavailability of RVT and EZE. Administration of solid dispersion combination (FDC) formulation through oral cavity can be viable and effective, alternative to other conventional therapy of atherosclerosis disease.

PC-30: Formulation and Evaluation of Herbal Gel for Promoting the Hair Growth

TRIPURNENI SUSHMITA R*, SAMRIT S R, BANSOD P G, TRIVEDI R V, UMEKAR M J

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, NAGPUR, MAHARASHTRA-441002

Email: sushtripurneni20@gmail.com

Aim of present study was to prepare and evaluate the herbal gel of extract of *Zingiber officinale* to promote the hair growth. Extraction of the powdered rhizomes of *Zingiber officinale* was carried out using various solvents i.e. (alcohol, water, alcohol: water ratio 1:1 (hydroalcoholic)). Herbal gel of 5% of extract of *Zingiber officinale* was prepared using carbapol 934, PVP, glycerine, methyl paraben and triethanolamine and evaluate. The flow behavior (viscosity) of the gel formulations was studied in a Brookfield Viscometer. pH of gel was determined on digital pH meter and was found to normal range. The stability study was performed to evaluate the separation as well

as precipitation of the drug in the excipients mixture. The results obtained from present work indicated that the entire drug present into Zingiber officinale gel and Minoxidil gel was uniformly distributed and there was no precipitation in formulation with the polymer and it spread easily. From the stability study it was observed that the formulation was stable at different temperatures for 3 month with no separation and precipitation. Calibration curve of standard Minoxidil was plotted at 200-400nm of using phosphate buffer pH 7.4 at different concentration was found to be drug is stable. The results showed that the most desirable gel formulation of Zingiber officinale extract found to be Hydroalcoholic gel formulation with good pH and acceptable viscosity and stable at all temperature.

PC-31: Formulation and Evaluation of Herbal Toothpaste using Musa Paradisiaca Stem Stalk

DHAWAS SWATI V*, PATIL A R, UMEKAR M J

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA-441002

Email: swatidhawas03@gmail.com

Aim of present study was to formulate the herbal toothpaste containing musa paradisiaca stem stalk extract. Collection of the musa paradisiaca stem stalk was from local area. Weighed quantity of calcium carbonate, calcium phosphate were transferred into mortar and pestle and mixed with the help of spatula, then the extract of musa paradisiaca was added and

mixed after that sodium lauryl sulphate and sodium saccharine was added and the mixture was stirred until paste is formed. Glycerine is added in small as per amount to form smooth homogenous paste; water was added as per need. lastly, clove oil, and mentha oil was added as flavouring agent. The antimicrobial and evaluation study was performed. We reported that the extraction of musa paradisiaca stem stalk extract shows antibacterial activity against E.coli and S.aureus. the physical properties of musa paradisiaca stem stalk extract were found to be creamish brown in colour and smooth paste. it is soluble in fixed oil, slightly soluble in NaOH, and HCL. the main purpose of this study was to evaluate the effectiveness of antibacterial dentifrices of the herbal toothpaste prepared from musa paradisiaca in comparison to commercial fluoride toothpaste. It was concluded that musa paradisiaca stem stalk toothpaste was prepared and evaluated and it showed good antimicrobial activity

PC-32: Topical Azathioprine Proniosomal Gel in the Treatment of Rheumatoid Arthritis

PATIL PRANALI SUDHAKAR*, PILLARE SA, TATODE AA, UMEKAR M J

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, NAGPUR, MAHARASHTRA-441002

Email: Pranalipatil024@gmail.com

The purpose of this study was to formulate and evaluate the efficacy of topical azathioprine (AZT) proniosomal gel in the treatment of rheumatoid arthritis (RA). AZT proniosomal gel was prepared by the coacervation phase

separation method using span-60, phospholipid-90G, cholesterol and carbopol-934. The prepared formulation was evaluated for particle size, zeta potential, pH, viscosity, spreadability, in-vitro drug release, ex-vivo skin permeation and stability studies. The efficacy of formulation was evaluated by identifying the antiarthritic activity. The pH, viscosity and spreadability of optimized proniosomal gel were seen in the range of 6.87 ± 1.11 , 724 ± 3.64 cps and 6.86 ± 2.11 g.cm/sec respectively. Also the particle size and zeta potential was found to be 174.8 ± 3.61 nm and 21.8 ± 1.86 mV. The in vitro release study was demonstrated that the release of AZT from proniosomal gel was found to be $82.60 \pm 1.87\%$ in 24hrs. The percent drug permeation through skin of AZT solution, AZT proniosomes, plain AZT carbopol gel and formulation AZT proniosomal gel was found to be $24.08 \pm 1.65\%$, $65.65 \pm 1.35\%$, $22.03 \pm 1.98\%$ and $53.37 \pm 1.24\%$ in 24hrs respectively. The developed ATZ proniosomal gel formulation can be considered as a promising formulation for localized delivery of AZT with reduced toxicity.

PC-33: HPLC Determination of Essential Amino Acids in Marketed Protein Supplements using Precolumn Derivatization

KHATRI MONIKA*, BODLA R, MISHRA D, SINGH B, PAL G

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH (DIPSAR), NEW DELHI-110017

Email: khatrimonika97@gmail.com

HPLC is an essential and versatile tool in quality control and quality assessment of pharmaceuticals and their formulations. We have developed precise and accurate RP-HPLC method for simultaneous estimation of essential amino acids using gradient elution, using Mobile phase A: 0.1mol/l pH6.5 Acetate buffer solution:ACN(93:7) and Mobile Phase B: ACN:Water(4:1), delivered at a flow rate of 1.2ml/min. Amino acids were detected at 254nm using PDA detector. The method used was validated as per ICH guidelines Q2A and Q2B. Linearity range for amino acids were observed at 1-100µg/ml and with correlation coefficient greater than 0.9993. Accuracy was determined with percentage recovery in range of 88-1021% for Horlicks and Bournvita, 90-101% for Pediasure and 90-100% for Nutrilite. Precision was determined in terms of repeatability, intraday and interday precision, showing % RSD less than 2. Out of the 4 samples, Nutrilite was found to be the richest source of amino acids having Phenylalanine in highest quantity among other aminoacids (78mg/g protein). In Bournvita, Threonine was in the highest amount (86mg/g protein), in Horlicks, Valine was in highest amount (96mg/g protein), in Pediasure, Lysine was in highest amount (50mg/g protein). The HPLC method for the estimation of amino acid was found to be accurate, precise, robust and reproducible. This method could be useful for quantitative application of amino acids both in terms of Quality control and Quality assurance point of view.

PC-34: A Validated LC-MS/MS Method for Determination of

Dapagliflozin in Tablet Formulation

ARORA AANCHAL*, KALYAN SAHIL, PARLE AMRITA

DELHI INSTITUTE OF PHARMACEUTICAL SCIENCES AND RESEARCH (DIPSAR), NEW DELHI-110017

Email: aaanchal2017@gmail.com

A highly sensitive, precise and accurate LC-MS/MS method is developed and validated for the determination of Dapagliflozin in tablet formulation. Chromatographic separation was carried out on Agilent InfinityLab Poroshell 120 EC-C18 (2.1×100 mm, 2.7 µm) column. Isocratic elution was based on 5mM ammonium acetate: acetonitrile (20:80, v/v) as mobile phase, column temperature at 35°C and flow rate at 0.2 mL min⁻¹ were utilized. The mass spectrometer was operated under multiple reaction monitoring (MRM) mode using electrospray ionization by monitoring the transition pair (precursor to product ion) of m/z 426.20-107.20 in the positive mode. The method was found linear in the concentration range of 25-500 ng/mL. The limit of detection (LOD) and limit of quantitation (LOQ) were 6.83 ng/mL and 20.70 ng/mL respectively. The optimized method was validated according to the International Conference on Harmonization (ICH) guidelines. The developed method was found suitable for the quantitation of dapagliflozin in tablet dosage form. **Keywords:** Dapagliflozin, LC-MS/MS, Validation, Assay, Spectroscopy.

PC-35: Quality by Design Approach to Analytical RP-

HPLC Method Development and Its Validation

ANANDPARA TANVI M*, SARVE KL, HEMKE AT, UMEKAR MJ

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, NAGPUR, MAHARASHTRA-441002

Email: anandparatanvi@gmail.com

Aim of present study was to develop RP-HPLC method for the estimation of Mangiferin based on Quality by Design approach. An efficient experimental design based on systematic scouting of two key components of the RP-HPLC method (mobile phase and flow rate) is presented. The stock solution mangiferin was made in methanol and absorption of standard solution of mangiferin was determined. The chromatographic condition were optimized with design expert software 11.0 version, i.e. Agilent C18 column (250 × 4.6 mm, 5µm), mobile phase used pH 3.0. Methanol and 0.1% OPA (50:50), flow rate was 0.7 mL/min. The described method was linear (R²=0.998) with range 10-50 µg/mL. The precision, ruggedness and robustness values were also within the prescribed limits. The absorption maximum of standard solution of Mangiferin was found to be 302nm. Chromatographic peak purity results indicated the absence of eluting peaks with the main peak of. A novel simple fast and robust RP-HPLC analytical method of MGN was successfully developed by employing QbD approach (BBD design) and further validated according to ICH guidelines. The quality by design principle was applied to Method development of MGN by the use of DOE approach where box-behnken design was used to analyse various analytical target profile.

PC-36: Nepafenac Loaded Pluronic Micelles for Effective Treatment of Uveitis

DAMBHARE AKANSHA VIJAY*,
SELUKAR P, TATODE A

SMT. KHISHORITAI BHOYAR COLLEGE
OF PHARMACY, KAMPTTEE, NAGPUR,
MAHARASHTRA- 441002

Email: akanshadambhare13@gmail.com

The purpose of this study is to improve bioavailability of Nepafenac (NPF) by preparing polymeric micelles using pluronic F127 for the effective treatment of uveitis. Preformulation parameters were performed for authentication of drug purity. The polymeric micelles are prepared by thin film hydration method by using polymer (Pluronic F127). The prepared micelles were evaluated for particle size, zeta potential, PDI, pH, SEM, in vitro, ex vivo drug release study and stability study. Preformulation study indicates the authentication of drug purity and compatibility. The particle size, PDI and zeta potential of NPF micelles was found to be 210 to 250 nm with narrow polydispersity index (0.60 to 1.39) and -13.1 mV respectively. The pH of the formulation was in the desired range 6.1 to 7.3. Then surface morphology of optimized formulation examined by SEM and it was appeared as spherical in structure. In in-vitro release profile showed 69.45±0.6% release in 12hr, drug release rate increased with increasing amount of nepafenac in the formulations and Ex-vivo result was found to be 74.99±1.1 % in excised goat cornea. The result reveals

that the NPF loaded micelles having better bioavailability and sustain release of NPF than the marketed suspension formulation.

PC-37: Radiopharmaceuticals in healthcare

PRAJAPATI AKANSHA*, KHARB
DERVESH

DELHI INSTITUTE OF PHARMACEUTICAL
SCIENCES AND RESEARCH, PUSHP
VIHAR-110017, NEW DELHI

Email: devprajapati682@gmail.com

Amongst therapeutic radiopharmaceuticals, targeted alpha therapy (TαT) can deliver potent and local radiation selectively to cancer cells as well as the tumor microenvironment and thereby control cancer while minimizing toxicity. In this review, we discuss the history, progress, and future potential of TαT in the treatment of prostate cancer, including dosimetry-individualized treatment planning, combinations with small-molecule therapies, and conjugation to molecules directed against antigens expressed by prostate cancer cells, such as prostate-specific membrane antigen (PSMA) or components of the tumor microenvironment. A clinical proof of concept that TαT is efficacious in treating bone-metastatic castration-resistant prostate cancer has been demonstrated by radium-223 via improved overall survival and long-term safety/tolerability in the phase III ALSYMPCA trial. Dosimetry calculation and pharmacokinetic measurements of TαT provide the potential for optimization and individualized treatment planning for a precision medicine-based cancer management paradigm. The ability to combine TαTs with other agents, including

chemotherapy, androgen receptor (AR)-targeting agents, DNA repair inhibitors, and immuno-oncology agents, is under investigation. Currently, TαTs that specifically target prostate cancer cells expressing PSMA represents a promising approach.

PC-38: Development and validation of RP-HPLC method for estimation of naftopidil as API and in tablet dosage form

PUROHIT PRASHANT*, MISHRA P, ALI S
SWAMI KESHVANAND INSTITUTE OF
PHARMACY, BIKANER-334001

Email: prashantskip@gmail.com

A reversed phase HPLC method for the estimation of Naftopidil has been developed. The drug was separated on ODS column using methanol and water as mobile phase in ratio of 80:20 v/v at flow rate of 0.8 ml/min. Components are detected simultaneously at 280 nm using UV detector. The detection limits for Naftopidil was 0.0327 µg/ml whereas the quantitation limits was 0.0991 µg/ml. Linearity range was established in range of 2–12 µg/ml for Naftopidil. Recovery of the added Naftopidil standard mixture in tablet solution was found 99.81 ± 0.384 with Relative standard deviation (n=3) of 0.384 %. The proposed method has been applied to the determination of Naftopidil in commercial products. The results obtained by methods were in good agreement of true values. The proposed method is simple, accurate, reproducible and suitable for routine analysis.



PD-01: Formulation and evaluation of floating tablets of black pepper extract

ASWATHA RAM HN*, SHETTIGAR S, NAYAK UY, RATHNANAND M

MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES, MANIPAL ACADEMY OF HIGHER EDUCATION [MAHE], MANIPAL-576104

Email: aswatharam@gmail.com

Black pepper (*Piper nigrum*) has been used in folk medicine as stomachic, aromatic, diaphoretic and hepto-protective. *Helicobacter pylori* is identified as gastric carcinogen and known to cause gastric cancer by injecting virulent toxin CagA and translocating VacA. Black pepper is known to have antioxidant, antiulcer activity and gastro protective effects. Therefore, the present work aimed at the preparation and evaluation of floating tablets of black pepper extract. In the current experiment, we have developed gastro-retentive floating tablets of standardized pepper extract by direct compression method and evaluated for various in vitro parameters. Tablets containing HPMC K100M, pepper extract, sodium bicarbonate, talc, magnesium stearate and colophony were prepared by direct compression method and evaluated. Formulations were optimized based on buoyancy time and in vitro drug release. Optimized formulation showed good floating behaviour along with better controlled drug release. The successful formulation was found to be F3 and its buoyancy time was less than one minute and drug release was up to 10 hours. We conclude that, the developed formulations can be effectively used to treat ulcers and in the prevention of gastric carcinogenesis.

*PD-02: Phytochemical investigation and organ toxicity study of *Datura alba* (datura)*

HUNASAGI BS1*, KALYANE NV2, GAVIRAJ EN1

BLDEA'S SSM COLLEGE OF PHARMACY & RESEARCH CENTRE, VIJAYAPUR-586103

Email: basavbjp73@gmail.com

Now days along with the popularity of Ayurvedic medicines the toxicity produced by them is also heard frequently. The present study has been undertaken to see the toxicity if any produced by *Datura alba* Nees on various organs of albino rats, before and after purification. The dried seeds of *Datura alba* were extracted with ethanol (90%). Extracts of *Datura alba* Linn. (Solanaceae) were screened for Phytochemical analysis before and after the purification. The chronic toxicity studies were carried out at high, moderate, and low dose levels of both purified *Datura* extract which was given to Group I and Non-purified extract which was given to Group II and Group III was administered with vehicle distilled water. After completion of study haematological, Biochemical, and Histopathological studies were done. By seeing all the results, it can be concluded that toxicity of *Datura* seeds has reduced after purification by gomutra.

*PD-03: Activity of the stem bark and leaves extract of *Bauhinia variegata* Linn.*

HARSH RAJ*

SCHOOL OF PHARMACY, GRAPHIC ERA HILL UNIVERSITY, CLEMENTOWN, DEHRADUN-248001

Email: harshraj70827@gmail.com

The aim of the current study is to evaluate the use of the plant, the antimicrobial activities of extracts of the stem bark and leaves of *Bauhinia variegata* Linn. were evaluated against Gram +ve, Gram -ve and Fungi. Dried powdered plant parts were extracted using aqueous and organic solvents (acetone and ethanol). The antimicrobial activity of the concentrated extracts was evaluated by determination of the diameter of zone of inhibition against both gram negative and gram-positive bacteria and fungi using the paper disc diffusion method. Phytochemical studies revealed the presence of tannins, saponins, sesquiterpenes, alkaloids and tannins and the extracts were active against both gram positive and gram-negative bacteria. The activity of the plant extracts were not affected when treated at different temperature ranges (4 oC, 30 oC, 60 oC and 100 oC), but was reduced at alkaline pH. Studies on the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of the extracts on the test organisms showed that the lowest MIC and the MBC were demonstrated against *S. paratyphi*, *B. subtilis* and *S. typhi* and the highest MIC and MBC was exhibited against *Staphylococcus aureus*. *Bauhinia variegata* Linn. has broad spectrum antibacterial activity and a potential source of new classes of antibiotics that could be useful for infectious disease chemotherapy and control.

PD-04: Quality control

evaluation of in-house prepared polyherbal ayurvedic formulation Kachnaar guggulu

DUKLAN SAKSHI*

**SCHOOL OF PHARMACY, GRAPHIC
ERA HILL UNIVERSITY, CLEMENTOWN,
DEHRADUN-248001,**

Email: duklansakshi4@gmail.com

The most important ayurvedic drug, i.e., Kachnaar Guggulu have selected from ayurvedic famous books named Ayurvedic Pharmacopoeia of India ayurvedic monographs for phytochemical and physicochemical study. These ayurvedic drugs are mainly and commonly used in the treatment of heart, skin, and stomach-related disease. Physicochemical and phytochemical study such as extractive value, ash value, moisture content, pH values, true density, bulk density, angle of repose, Carr's index, Hausner's ratio, fluorescence analysis, and thin-layer chromatography was covered in the study. Phytochemical study revealed that reducing sugars, tannin, phenolic compounds, saponin glycosides, and gum were present in the sample. Various physicochemical parameters had been studied in the standardization procedures and were compared with reference standards. The extractive, ash values, and fluorescence analysis were done and were compared to reference standard. The physicochemical standardization of polyherbal formulation Kachnaar Guggulu was carried out. The individual ingredients of the formulation were authenticated and standardized as per the WHO guidelines and

Indian Herbal Pharmacopoeia. The in-house formulation was prepared and studied for various physicochemical properties. Although no marketed sample is available; hence, a probability is made under standard evaluation parameter to launch this product in market for sale.

PD-05: Quality control studies for polyherbomineral ayurvedic formulation

SEM WAL VAIBHAV*

**SCHOOL OF PHARMACY, GRAPHIC
ERA HILL UNIVERSITY, CLEMENTOWN,
DEHRADUN-248001.**

Email: vaibhavsemwal.com@gmail.com

Ayurvedic formulations are highly effective and known to have minimal or no side effect, but due to lack of validation parameters for identification and quality control, there is a lacuna in demand of Ayurvedic formulations at international level. Shatsakar Churna is a widely used polyherbal Ayurvedic formulation for constipation and gastric troubles. Standardization and quality control parameters of Shatsakar Churna, are not well defined. The objective of the work is to formulate and standardize the Satsakar Churna according to World Health Organization (WHO), GMP guidelines which are the first available report so far. The formulation was prepared in the Institute's pharmacy and evaluated for organoleptic characters, powder drug studies, physicochemical parameters (total ash, acid insoluble ash, water soluble ash, water soluble extractive, ethanol soluble extractive), micrometric evaluation (density and flow

properties) and phytochemical evaluations. The results of different standardization parameters revealed satisfactory and sufficient data to evaluate the inhouse formulation and can be utilized as reference standards in various quality control aspects of the formulation, powder drug analysis revealed specific identities for crude raw drug which are useful as marker in the preparation and identification of components of the formulation.

PD-06: Composition and Uses of the Peel of Mango

**ANSARI AADIL*, GUPTA RAVI, PAL
NISHIKANT, SONI YASH**

**KOTA COLLEGE OF PHARMACY, RANPUR,
KOTA, RAJASTHAN-325003**

Email: aadilansari0126@gmail.com

Mango peel is a waste product of mango processing which is available in large quantities in India during the harvest season, when disposal causes pollution problems. Currently, utilisation of mango peels in different ways is gaining attention due to their nutritional and pharmacological activities. Mango peel is a novel source of dietary fibre, polyphenols and carotenoids that can be utilised therapeutically. The mango peel is used as a functional food ingredient due to the presence of compound that imparts significant health benefits. The powder of mango peel is use to develop nutritious recipes because having high quantity antimicrobial efficacy. The scientific name of mango is *Mangifera indica* & the family is *Anacardiaceae*. The peel of mango also used for methane generation. The mango peel has many bio-active substances which can be used in the pharmaceutical industry. The

peel of mango have also found mineral salts , antioxidants, antibacterial substance, valuable sterols & having many anticancer properties. Besides this it is also antitumor as well as anticonvulsant and liver protector.

PD-07: Isolation and Characterization of Phytochemicals from Roots of Asteracantha Longifolia

HUMANE RUPALI*, RAUT P, HEMKE A, UMEKAR M

SMT. KISHORITAI BHOYAR COLLEGE OF PHARMACY, KAMPTEE, MAHARASHTRA-441002

Email: rupalihumane93@gmail.com

The aim of the study was to extraction, isolation and analyzes the phytochemical constituent of medicinal plant such as asteracantha longifolia. In this study, H. schulli roots were extracted with ethanol in soxhlet apparatus and Isolation of phytoconstituents was done by Column chromatography using gradient elution with different mobile phases and silica gel as stationary phase, different spectroscopic method were used to elucidate the structure of isolated compound, including FTIR and NMR. From the physical, chemical analysis of ethanolic root extract contain alkaloids, phenolic compounds, tannins, carbohydrate, amino acid, protein and from spectral evidence isolated compound was found as β - sitosterol. In proposed study we found that the ethanolic root extract contain β -sitosterol which responsible for medicinal activity.

PD-08: Antihyperglycemic

Activity of Ficus sarmentosa Leaves Extract on Streptozotocin Induced Diabetic Rats

ANANYA PANDIT*, DEBRAJ MUKHOPADHYAY2, SONIYA RANI1, ANUJ MITTAL1, ANJU RAWAT3, SHANTANU TRIPATHI4

DEPT. OF PHARMACY, UIPS, UTTARANCHAL UNIVERSITY, DEHRADUN, UTTARAKHAND 2DEPT. OF PHARMACY & ALLIED HEALTH SCIENCES, DELHI PHARMACEUTICAL SCIENCE & RESEARCH UNIVERSITY (DPSRU), NEW DELHI 3DEPT. OF PHARMACY, GRD(PG)-IMT, DEHRADUN 4DEPT. OF CLINICAL PHARMACOLOGY, CALCUTTA SCHOOL OF TROPICAL MEDICINE, CALCUTTA MEDICAL COLLEGE & HOSPITAL, KOLKATA; UTTARANCHAL UNIVERSITY, GIRLS HOSTEL BLOCK- C, PREMNAGAR, DEHRADUN, UTTARAKHAND-248007

Email: ananyapanditdgp@gmail.com

Ficus sarmentosa is a well known medicinal plant of ayurveda with various pharmacological as well as medicinal properties. It is used in Indian Ayurvedic herbal system to cure malaria, ethno medical in Nepali folk medicine. It is also one of the most widely used as medicinal plant in the local area of Chamoli (Garhwal). However no reports are available about the constituents of the plant which is responsible for antidiabetic activity and the mechanism of antidiabetic action. The aim of the study is to investigate the effect of various extracts of the leaves of F. sarmentosa on blood glucose and lipid levels in STZ-diabetic rats in animal experimental model of diabetes mellitus. The medicinal activity of F. sarmentosa fine powder (# 40 mesh) 500gm of powers were subjected to

successive hot continuous extraction (soxhelt) with petroleum ether, ethyl acetate, methanol and water. These were evaluated against STZ (60mg/kg) induced hyperglycaemic activity with respect to standard medicine: Glibenclamide (1ml/100gm) suspension to the diabetic group of suspension at specific time interval is to be carried out (n=6) in wistar albino rat in 7 groups. The study had showed that these three (ethyl acetate, methanolic and aqueous) extracts of F. sarmentosa leaves have reduced blood glucose level and body weight significantly. This is the justification on the use of ficus species as ethno medical medicine for treatment of diabetes mellitus.

PD-09: Phytochemical Investigation and pharmacological Evaluation of Citrus Maxima Leaves for antifungal activity

KAKUL CHAUDHARY*

DEV BHOOMI GROUP OF PHARMACY AND RESEARCH, DEHRADUN, UTTARAKHAND-2480007,

Email: kakulaarush@gmail.com

Fungal infections are very common ailment in tropical and subtropical countries. Treatment over a long period with synthetic antifungal agents produces severe side effects. To avoid the hazards of synthetic agents focus has been concentrated on safe and economic herbal antifungal agents. The objective of this study is phytochemical investigation and pharmacological evaluation of Citrus maxima (leaves) for antifungal activity. Phytochemical

constituents were evaluated by chemical test. The antifungal activity of the Citrus maxima (leaves) was detected on pathogenic fungal strain by disc-diffusion method. The ethanolic extract of Citrus maxima leaves phytochemically rich in flavonoids and inhibited growth of different fungal strains like Bacillus subtilis, Psuedomonas aeruginosa and Escherichia coli at various concentrations from 100 mg to 400 mg. Maximum zone of inhibition with respect to the standard drug was obtained with 400 mg. Citrus maxima leaves could be alternative to synthetic antifungal agents although preclinical and clinical studies are needed to be performed before human use.

Keywords: Citrus maxima leaves, flavonoid, Antifungal agent,

PD-10: Evaluation for Psidium guajava Roots for Antihelmintic Activity

KOHLI ANCHAL*

DEV BHOOMI INSTITUTE OF
PHARMACY AND RESEARCH,
DEHRADUN, UTTARKHAND-2480007,

Email: anchal14336@gmail.com

The Guava plant (Psidium guajava) is considered as good therapeutic agents for many diseases especially skin problems like wrinkle and hyper pigmentation. It is also used as mouth deodorant. Helminthiasis in human and animal is usual problem in developing countries. Psidium guajava roots are claimed to possess anthelmintic property in traditional system of medicine. The aqueous extract (2mg/ml, 4mg/ml, 8mg/ml) Psidium guajava root was screened out for anti-helminthic potential.

Piperazine citrate was used as standard drug and earth worm was used as helminth strain. It has been observed that extract of Psidium guajava root at the dose of 4mg/ml possess a good anti-helminthic activity when compared to the standard drug. Psidium guajava root could be used as anthelmintic agents as it is potent and safe. It is easily available so it will be economic too.

Key words: Psidium guajava, anthelmintic agents, root.

PD-11: Preparation and Standardisation Of Navkarshik Churna

VATS VANYA*, VISHWASH B, TRIVEDI RK, SAMANTA J

DEV BHOOMI INSTITUTE OF
PHARMACY AND RESEARCH,
DEHRADUN, UTTARKHAND-2480007.

Email: vanyavats529@gmail.com

Navkarshik Churna was found to possess higher rate of chemicals and promising to treat the Gout Arthritis. When the uric acid got misbalanced in body and toe joint gets hurt, then this formulation can help to treat it. It is also used to treat other types of arthritis. It also removes the toxins from the body. Some of the constituents helps to treat the pitta and regulates the heat of the body. Like giloy is the immunomodulator and improves the immunity. Whereas daruhaldi act as anti-inflammatory in the body. Standardization of any herbal formulations is important for safety, handling and proper selection of crude materials. In this research it was attempted to evaluate homemade Navkarshik Churna in

comparison to marketed formulation. All the tests like physiological test, phytochemical test, ash value, moisture content, extractive value etc. were performed for finding the compatibility of marketed and homemade formulation. It was observed that the set of parameters were sufficient to standardize the Navkarshik Churna. These findings could be useful for formulation which is gaining relevance in research on traditional medicinal system.

Key words: Navkarshik Churna, standardization, homemade formulation, marketed formulation

PD-12: Formulation of Anti-inflammatory gel from Proteolytic Enzyme.

DIXIT VIBHOR*

DEV BHOOMI INSTITUTE OF PHARMACY
AND RESEARCH, DEHRADUN, UTTARKHAND-
2480007,

Email: vibhord57@gmail.com

In today's era much interest is arisen to discover new medicinal plants with anti-inflammatory activities due to lesser side effects of plant products as compared to the synthetic drug available. In quest of safe, minimum toxic and maximum efficacious anti-inflammatory agent the following research work was undertaken. After detail literature review it was found that Thevetia peruviana latex is used in folklore medicine as anti-inflammatory agent. But there is no scientific evidence for the claim. The present study was under taken to establish the scientific evidence for anti-inflammatory activity of the latex of

Thevetia peruviana (TPLa) and formulate an anti-inflammatory gel. Anti-inflammatory activity was studied by the HRBC membrane stabilizing method and protein denaturation method. The results of the study revealed that TPLa was rich in various phytoconstituents but of all contains the proteolytic enzymes in abundant. From the above investigation it was found that the TPLa produced the maximum membrane stabilizing effect at concentration 0.05mg/ml. It could be concluded that TPLa is a potent anti-inflammatory agent. On basis of anti-inflammatory property of TPLa, total five formulations (F1 to F5) were prepared varying the concentration of excipients and F3 (4% humectant) TPLa anti-inflammatory gel could be substitute for synthetic anti-inflammatory gel.

Key words: Thevetia peruviana, latex, anti-inflammatory gel.

PD-13: Pharmacognostic standardization and pharmacological evaluation of Passiflora vitifolia leaves for anti-inflammatory activity.

AARATI*, ROHIT PAL, MAHAMEDHA, TULSI BISHT

DEV BHOOMI INSTITUTE OF PHARMACY AND RESEARCH, DEHRADUN, UTTARKHAND-2480007.

Email: aaratis192@gmail.com

Passiflora is a well known ayurvedic plant for many diseases such as insomnia, anxiety and high blood pressure. But this plant does not

have scientific evidence so far. Passiflora are rich in flavonoids having main class, flavonoid glycosides, which produces central action such as sedative and hypnotic, anxiolytic and analgesic. The aim of the research was pharmacognostic standardization and pharmacological evaluation of Passiflora vitifolia leaves for anti-inflammatory activity. Microscopic measurement (fibre length and width), Ash values and extractive values of Passiflora vitifolia leaves were determined to set the pharmacognostic standards. Chemical constituents were evaluated through chemical tests and Thin Layer Chromatography. The ethanolic extract of Passiflora vitifolia leaves (PVLE) were subjected to evaluate in-vitro anti-inflammatory activity through HRBC method. PVLE was found to contain alkaloids, flavonoids, tannins and phenolic compounds. PVLE showed significant anti-inflammatory potential in concentration 150 µg/ml. It can conclusively state that PVLE is a potent anti-inflammatory agent.

Keywords: Passiflora vitifolia, Medicoculturally, In-vitro activity, Anti-inflammatory.

PD-14: Invitro Anti-inflammatory Activity of Grevillea Robusta Leaves

KHALI AYUSHI* , KUMAR VINEET, SAMANTA J

DEV BHOOMI INSTITUTE OF PHARMACY AND RESEARCH, DEHRADUN-UTTARKHAND-2480007

Email: ayushib.143@gmail.com

NASAIDS are the choice of drug for inflammation. NASAIDS caused severe side

effects like hyperacidity, gastric ulcer and so on. To avoid the side effects of NSAIDs, there is an urgent need for searching new molecule from natural origin. Present study is therefore aimed to explore Grevillea robusta for anti-inflammatory activity. Methods: Methods employed for evaluation of anti-inflammatory activity were HRBC method or Membrane stabilisation method and Heat induced haemolytic method. The leaves of Grevillea robusta showed significant anti-inflammatory activity. The Ethanol extract (GRLE) shows significant anti inflammatory activities. GRLE is found to contains polyphenols as chemical constituents which is the basis of anti-inflammatory. On basis of result we can conclude that Ethanol extract of leaves of Grevillea robusta has good anti-inflammatory activity. GRLE could be used for treatment of inflammation.

Key word: Grevillea robusta, leaves, anti-inflammatory activity

PD-15: Formulation and Evaluation of herbal hand wash using Neem leaves extract and Jackfruit seed oil.

KUMAR ANIL*, VARDHAN HARSH, SINGH NP, SAMANTA J

DEV BHOOMI INSTITUTE OF PHARMACY AND RESEARCH, DEHRADUN, UTTARKHAND-2480007

Email: ayadaw25@gmail.com

The herbal medicines are significant part of healthcare throughout the world. Hand wash become essential part of our life to avoid infections. Synthetic hand wash produces dryness, irritation, itching and dermatitis

to some individuals. The aim of present work was to prepare formulations of poyherbal hand wash from the ethanolic extracts of leaves of *Azadirachta indica* (Neem) and Jackfruit seed oil. Two formulations (F1 and F2) were prepared and the formulations were evaluated for physical properties (colour, fragrance) and chemical parameters (pH, Viscosity) and Anti-Microbial Activity, Skin irritation test etc. The antimicrobial activity of prepared formulations was checked against *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Escherichia coli* by agar diffusion method. The results showed that hand wash prepared from extract of *Azadirachta indica* (alcoholic and aqueous) have effective activity with less or no side effects. Antimicrobial activity of prepared formulation is significant as compared to marketed neem hand wash. So, neem leaves and jackfruit seed oil can be used for herbal hand wash preparation for commercial purpose.

Key words: *Azadirachta indica*, Herbal hand wash

PD-16: Formulation and Evaluation of Mosquito Repellent Lotion of Adhatoda vasica stem Extract

MISHRA AMIT,* BHATT RS, TRIVEDI RK, SAMANTA J

DEV BHOOMI INSTITUTE OF PHARMACY AND RESEARCH, DEHRADUN, UTTARAKHAND, 2480007

Email: amitmishra.a.a.am@gmail.com

Mosquitoes are carrier of much life threatening disease like dengue, chicken guinea and many more. *Adhatoda vasica* (Acanthaceae) is a popular plant for its diverse medicinal

properties. *Adhatoda vasica* stem smokes are commonly used to chase mosquitoes in village areas. But no scientific evidence is available till date. The objective of the work was to formulate a mosquito repellent product containing *Adhatoda vasica* (Acanthaceae). A lotion was formulated using *Adhatoda vasica* stem extract and was evaluated for various parameters like smooth texture, spreadability skin irritation and stability. The main evaluation based on the cage test, cone test which determine the significant result for the activity. Evaluation tests indicated that the formulation (pH7) is a non irritant and suitable for the skin. There is no phase separation during thermal stability. From the present work, it was concluded that 2ml and 6ml *Adhatoda vasica* containing lotion is safe, effective, usable for the skin and stable too and give effect result after the 4.0 and 4.5 intervals after application. The research determine the potential of *Adhatoda vasica* stem lotion as efficient cheap, eco-friendly, safer mosquito repellent and alternative to the chemical mosquito repellents.

Keyword: *Adhatoda vasica*, cone test, mosquito repellent, cage test.

PD-17: Evaluation of antihelmintic Activity of Woodfordia Fruticosa Bark(WFB).

KUMAR RAUSHA*, SINGH ROHIT, TRIVEDI RK, SAMANTA J

DEV BHOOMI INSTITUTE OF PHARMACY AND RESEARCH, DEHRADUN, UTTARAKHAND-248007

E-mail: raushanraj6808@gmail.com

Parasitic diseases are common problem of

developing and underdeveloped countries. Side effects are prevalent in all synthetic medicine though they show remarkable curing or preventive effect on number of parasitic diseases. The leaf and flower part *Woodfordia fruticosa* have anthelmintic activity. The research work was planned to check the anthelmintic activity of *Woodfordia fruticosa* bark (WFB) part. In-vitro evaluation method was employed to evaluate anthelmintic potency of WFB ethanolic extracts. Evaluation of anthelmintic activity of WFB was done by using earthworm and Albendazole solution as reference standard drug. Phytochemical screening revealed the presence of tannins. The WFB ethanolic extracts is found to have a higher potency than albendazole as anthelmintic and potency increases with increase in concentration. *Woodfordia fruticosa* bark (WFB) is a superior anthelmintic agent than the synthetic agents presently available in market although in-vivo evaluation and clinical study is yet to be executed. Key words: *Woodfordia fruticosa*, bark, albendazole, earth worm.

PD-18: Formulation and Standardization of Topical Soothing Effect Ointment of Aloe-vera Extract.

KANDEL BINOD*, SAHU NIKITA, PANDEY J, SINGH NP, SAMANTA J

DEV BHOOMI INSTITUTE OF PHARMACY AND RESEARCH, DEHRADUN, UTTARAKHAND-248007

E-mail: binodkandel99@gmail.com

The objective of this work was to formulate and standardized Aloe-Vera ointment for cosmetic purpose from herbal ingredient as well as by



using chemical ingredient. In this, 2 phases were prepared: i.e oily phase and water phase. The mixture of water-in-oil emulsion was prepared by adding aqueous phase to the oily phase under constant agitation. The oily phase consist of different chemicals such as light liquid paraffin, white petroleum jelly, olive oil, paraffin wax, cetyl alcohol, steryl alcohol and glycerol monostearate. The aqueous phase consists of sodium lauryl sulphate, distilled water and fragrance. Both the phases were heated and stirrer on magnetic stirrer. After the preparation of both the phases, the aqueous phase was added to the oily phase. A white coloured smooth Aloe-Vera ointment was obtained. Prepared ointment was evaluated and compared with reference standard. In the present work, prepared Aloe-Vera ointment was found to possess good properties as an ointment (pH ranges 6.8-7.2; Viscosity and Spreadability is comparable with marketed formulation; it does not cause any skin irritation and stable at room temperature for 15 days). Further optimization studies are required on this study to find the useful benefits of Aloe-Vera ointment on human use as cosmetic products.

Key words: Aloe-Vera, cosmetic, ointment,

PD-19: Formulation and Standardization of Herbal hair Cleanser

DHIMAN VATSAL*, CHAUDHURY POOJA, SINGH NP, SAMANTA JHUMA

DEV BHOOMI INSTITUTE OF PHARMACY AND RESEARCH, DEHRADUN, UTTARKHAND, 248007

E-mail: vatsaldhiman143@gmail.com

Hair plays a vital role in resembling human

beauty. Hair treated with herbal formulation provides strength, smoothness, silkiness and moisturize the scalp. Anti-dandruff property of a shampoo usually improves with use of neem, amla and reetha. The hair became smooth and manageable with herbal ingredients such as amla, reetha, bhringraj, henna. Present study was focused on formulation of hair cleanser and comparing it with the marketed formulation having the same ingredients in both. It was also focused on the use of herbs to maintain the good health of hair. A herbal hair cleanser was formulated using Shikakai, Reetha, Amla, Fenugreek seed powder, Hibiscus, Bрами, Cloves, Aloevera and Lime juice and compared with marketed formulation. A good blend of hair cleanser was made successfully and the standard parameters were evaluated (pH 5.9, Foaming type - light, Nature of hair after wash - Soft and manageable, Viscosity 1728.4 cP, Solid content 24.2%, Surface tension 33.17) which met the standard required for a good shampoo. The formulation is not only a good hair cleanser but also the results obtained can be used as reference standards in setting limits for quality control and quality assurance of some herbal hair cleanser.

Key words: Herbal hair cleanser, reference standards

PD-20: Philodendron species-plant seeking for validation of its therapeutic approaches

KAUR JASMEET*

SCHOOL OF PHARMACY, GRAPHIC ERA HILL UNIVERSITY, DEHRADUN-248002

Email: kaurjasmeet87111@gmail.com

Philodendron is a member of the Araceae (Arum) family and originates from the Caribbean, Colombia and Venezuela, but also grows in Asia nowadays. Hundreds of species are known, of which around ten have been promoted to houseplant status. The plant was first described in 1644, and was given its name in 1829. That name derives from Greek: 'philo' means 'love' or 'affection' and 'dendron' is 'tree'. Freely translated it means 'tea hugger', because Philodendron is a real climber that loves to 'embrace' trees. The plant symbolises health and abundance. However, the plant is used as an ornamental plant but some studies reveal that plant consists of triterpenoids and flavonoids in some of the species which can exerts some effective usage for various disorders. As per this information this plant species seeks for its validation to potentiate the therapeutic effect present in it.

PD-21: Anti-cancer activity of vegetables

SHARMA PARUL*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BAHADURGARH, HARYANA, 124507.

Email: sparul1407@gmail.com

The purpose of this paper is to gather a report on findings of follow-up researches and consider the potential of various vegetables for their cancer preventive properties. The data for the gathered information in report is grabbed from Pub Med, Research Gate, Elsevier, Science Direct, Bio Med Central, Science Daily, and FDA. Literature revealed that about 40-50% of all cancers can be prevented by including a good amount of vegetables and other dietary



fibers in diet. Vegetables exhibit strongest anti-oxidant property. It is believed that vegetable with greatest anti-oxidant property show anti-cancer activity. Vegetables possess a great potential to treat and prevent cancer as they are a good source of Quercetin, Selenium, Folic acid, Chlorophyll, Sulforaphane. Nutrition research concludes that a diet rich in fruits and vegetables protect against various cancer and almost all other disease including Cardiovascular diseases and Diabetes. There is a lot of unhealthy factors (like alcohol consumption, less exercise, obesity, high intake of concentrated sugars, low fibre intake, red meat consumption, imbalance of omega 3 and omega 6) that contribute to the development of cancer cells. Allium and Cruciferous vegetables (like Cabbage, Broccoli, and Cauliflower etc.) are beneficial to prevent cancer.

PD-22: Rheumatoid Arthritis

YADAV NISHA*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BAHADURGARH, HARYANA, 124507.

E-mail: nishayadav21031998@gmail.com

The data for this report has been taken from Research Gate and Mayo clinic's official website. Rheumatoid Arthritis is an auto immune disease which causes inflammation of the joints and surrounding tissues. The exact pathogenesis has yet not been explained, however studies suggest that cellular proliferation of synovocytes result in pannus formation which damages the cartilage and bone. Apart from conventional treatment strategies using NSAIDs, glucocorticoids, newer and safer drugs are continuously being searched. Alternative medicine provides another approach for treatment of Rheumatoid

Arthritis and currently a number of medicinal plants (Ginger, Black Pepper, Deodar Cedar, Ram Tulsi etc) are under scientific evaluation to develop a novel drug which provide safer treatment with minimum side effects. The anticipated outcome of this study will be to identify these medicines.

Keywords:- Rheumatoid Arthritis, pathogenesis, synovocytes, glucocorticoid

PD-23: Patents of Indian Medicinal Herbs

RAY BIKRAM*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BAHADURGARH, HARYANA, 124507.

E-mail: bikramray191997@outlook.com

To gather the information about patents of Indian medicinal herbs and their bio-piracy.

The data given here was collected from the various journals like Research gate, Indian journal of science and technology, PubMed and Indiana Journal of Global Legal Studies. India posses a rich legacy of valuable fauna and has been considered as a 'treasure house of valuable medicinal and aromatic plant species. The Ministry of Forest, Government of India has identified and documented over 9500 species considering their importance in the pharmaceutical industry. Out of this around 65 plants have a very high demand in world trade. Many plants such as Basmati rice, neem, pudina, kalmegh, aloe Vera, karela, jamun and brinjal have been the sufferers of bio-piracy. It has become a trend that many foreign companies are patenting the herbal drugs indigenous to India and restricting their future use. Many organizations such as WIPO

IGC, IPR etc. are made to prevent bio-piracy and many new methods like the digitization of traditional medicinal knowledge through Traditional Knowledge Digital Library Project are also employed.

Keywords: Patents, Indian Medicinal Herbs, TKDL

PD-24: Anti Asthmatic activity of Vegetables

YADAV MONIKA*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BAHADURGARH, HARYANA, 124507.

E-mail: raomonikayadav06011999@gmail.com

The paper work aims to collect a report on researches and consider the potential of various vegetables and plants as their anti asthmatic activity. The gathered report work has been grabbed from Pub Med, Research Gate, Science direct, and Science daily. The report demonstrate the signs and symptoms of asthma and there prevention with the help of various vegetables consumption in diet. Vegetables are rich source of beta carotene, Quercetin, Vitamin C. Vegetables lower the free radical level in body because of their anti-oxidant activities, which accounts for their anti-asthmatic activity and neutralizes molecules that increase airway contraction. The research review concludes that a diet rich in L-glutathione, beta carotene levels contribute to prevent asthma conditions by damaging free radicals in the body. Vitamin C levels in the vegetables and fruits contributes to the muscle contraction improvement and help in the clearance of airway passage. Water level also keep respiratory track in check and regulate calcium levels in the body.

Keywords: Asthma, L-glutathione, beta carotene, free radicals, vitamin C, airway passage.

PD-25: Obesity

DUBEY SUKRITI*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BAHADURGARH, HARYANA, 124507.

E-mail: sukritidubey06@gmail.com

The purpose of this paper is to gather a report on findings of follow-up researches on obesity. The data for the gathered information in report is graded from Pub Med, Research Gate, Elsevier, Science Direct, Bio Med Central, Science Daily, and FDA. At present, beneficial alternatives are there for the treatment of obesity such as modification in diet (lemon juice, aloe vera, green tea, honey and cinnamon), doing exercise, or by changing in behaviour, surgery, and pharmacotherapy. Many synthetic drugs used to reduce weight have major side effects. Fenfluramine, rimonabant, and sibutramine have been withdrawn from the market due to occurrence of major side effects. Literature reveals that *Bursera grandiflora*, *Camellia oleifera*, *Boerhaavia diffusa*, *Achyranthes aspera* and *Acorus calamus* have shown promising anti-obesity effects. Natural products are majorly used for the development of new types of therapeutics. Amongst all, Orlistat have been approved by the US food and drug administration for the treatment of obesity, as it inhibits Pancreatic Lipase (PL) which is a lipolytic enzyme which hydrolyses dietary fats in the lipid metabolism.

Keywords- Obesity, Pharmacotherapy, Fenfluramine, Rimonabant, Lipid Metabolism

PD-26: Health benefits of Chia seeds (Salvia hispanica)

SHOKEENANKIT*, KIRAN, CHAUDHARY HEMA

PDM UNIVERSITY, BAHADURGARH, HARYANA, 124507.

E-mail: ankitshokeen51@gmail.com

The purpose of this paper is to gather report on findings of the follow up researches and consider the benefits of chia seeds for their different beneficial changes in the body. The data for the gathered information in report is grabbed from Pub Med, Research Gate, Elsevier, Science Direct, Bio Med Central, Science Daily and FDA. Work revealed that chia seeds are rich source of omega -fatty acids. It has been found in the recent researches that omega-fatty acids improves digestive health, blood levels in heart, risk factors of cardiovascular disease and diabetes also. Chia seeds possess a great amount of carbohydrates, fibres, fats proteins, vitamins, minerals and water that found to deliver a massive amount of nutrients with very few calories to the body. Chia seeds have a lot of healthy benefits because of there loaded nutrients that have important benefits for body and brain as they are loaded with antioxidants, they are found to fight the production of free radicals in the body which can damage cell molecules and contribute to cancer cell development. They are found to have almost all the carbohydrates in them as fibres and have high quality proteins which also helps to loose weight. Nutrient researches found that chia seeds are also high in many bone nutrients. They help to improve diabetic conditions, obesity, cancer and cardiovascular diseases (CVS).

Keywords: anti-oxidants

PD-27: Wound Healing Potential of Moringa Oleifera

CHAKOLE R. D*.

GOVERNMENT COLLEGE OF PHARMACY, KARAD, MAHARASHTRA-415124

E-mail: msc2341@gmail.com

Present study deals with evaluation of continuous heat extracted fraction of *Moringa oleifera* leaves for antioxidant, wound healing and anti-inflammatory activity in albino wistar rats. The antioxidant activity was carried out by conventional DPPH radical scavenging method, wound healing activity was performed by considering incisions, anti inflammatory activity was carried out by using carageenan induced rat paw oedema method. The wounds treated with experimental extract showed faster wound closure (2427 days) and epithelization as compared to wound under untreated group (more than 30 days). The different diluted extract showed antioxidant activity in range of 16.24% to 32.78%. The extract showed significant anti-inflammatory activity as compared to standard reference drug: Ibuprofen. The results revealed that the anti-inflammatory activity possibly attribute to its free radical scavenging property.

Key Words: Wound healing, *Moringa oleifera*, antioxidant activity, anti-inflammatory activity

PD-28: HCMV-miR-UL70-3p inhibits H2O2 induced Apoptosis in HEK293T cells


PANDEYA ABHISHEK*, DR. GOSIPATALA SUNIL BABU

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY, VIDYA VIHAR, RAE BARELI ROAD, LUCKNOW- 226025

E-mail: abhi12pandey@rediffmail.com

MicroRNAs represent a class of small RNAs, which is of about 18- to 28-nucleotide-long, noncoding RNA molecules identified in Plants, all eukaryotic cells and even in Viruses also. Their major role is in the posttranscriptional regulation of protein expression, and their involvement was demonstrated in normal and in pathological processes by binding with the targeted mRNAs. Reports pertaining to the HCMV miRNA's role for viral survival inside the hosts are accumulating, we initiated this study to unravel the role of HCMV miRNAs on cellular apoptosis. Apoptosis is the major types of cellular death mechanism present in the humans, attributed its role in viral pathogenesis. Our in-silico studies reveal that the HCMV miRNAs targets several apoptotic genes such as MOAP1, ERN1 and IRAK1 and down regulates apoptosis. In vitro studies using HEK293T cells show that the hcmv-miR-UL70-3p downregulate H₂O₂ induced apoptosis in HEK293T cells evaluated through different cell proliferation assays. The qRT-PCR results as well as Flow cytometer shows the inhibition rate of apoptosis @ 11 and 9% respectively. The study results indicate that HCMV uses its miRNA machinery to counter the cellular apoptosis and it is attributed to miR UL 70-3p.

Keyword: Human Cytomegalovirus (HCMV), Modulator of Apoptosis (MOAP1) , miR UL 70-3p

PD-29: Determination

of Quinine in Cinchona officinalis by High Performance Thin Layer Chromatography

DEEPENDRA SINGH*, MANJU SINGH

INSTITUTE OF PHARMACY, PT. RAVISHANKAR SHUKLA UNIVERSITY, RAIPUR, CHHATTISGARH- 492010

Email- drdsinghuiop@gmail.com

A simple, precise and accurate high-performance thin-layer chromatographic method has been established for quantitative determination of quinine in Cinchona officinalis. **Methods:** The study was carried out to identify the extent of quinine of Cinchona officinalis by HPTLC. The standard and sample solution were applied over the pre-coated silica gel 60 F254 plates as a stationary phase using CAMAG HPTLC System 100µl Hamilton syringe with the help of Linomat V applicator, application distance maintained at 5mm. Conditions were also optimized for best possible extraction of quinine via varying concentrations of diethyl amine in different solvents (n-hexane: chloroform: ethyl acetate: methanol) for maximum recovery of quinine. Methanol modified with 20 % Diethyl Amine found to be best for highest possible recovery of target marker quinine. Ethyl acetate: diethyl amine in the proportion 88: 12 (v/v), as mobile phase. Plate was placed into CAMAG twin through chamber for saturation for 20 min. Integrator software vision CATS used for calculation. The determination was carried out using the densitometric absorbance mode at 236 nm. **Results:** Quinine response was found to be linear over the range 4–24 µg spot⁻¹. The

HPTLC method was validated for precision, accuracy and repeatability.

PD-30: High Performance Liquid Chromatography method for quantitative estimation of Reserpine in Rauwolfia serpentina

S. J. DAHARWAL*

INSTITUTE OF PHARMACY, PT. RAVISHANKAR SHUKLA UNIVERSITY, RAIPUR, CHHATTISGARH - 492010

Email- sjdaharwal@gmail.com

A simple, precise and accurate high-performance liquid chromatography separation method with a photodiode array detector has been developed for quantitative determination of reserpine in Rauwolfia serpentina. The reserpine was separated by using isocratic mode consisting methanol: acetonitrile: 18mM sodium acetate buffer (pH 3.5) and detected at 356nm. The extraction procedure, sample preparation, and HPLC conditions were evaluated and optimized. The method was fully validated in terms of accuracy, precision, specificity and calibration curve. The method showed good linear relation in the range of 5-50 µg/ml with relative standard deviation of 0.61-0.96 %. The correlation coefficient of the calibration curve for the analysis were all higher than 0.999. In addition, the limit of detection was 20 ng and the limit of quantification was 50 ng. The determination of reserpine content in various solvent extracts exhibited a mean content of 0.44±0.33%. Recovery experiments led to a mean recovery rate of 96.49±2.42 %. The proposed method is less-time consuming,

sensitive and reproducible and is therefore suitable for routine analysis of reserpine in various extracts of R. serpentine

PE-01: Artificial Intelligence: A revolution in world of pharmaceuticals

PALIWAL SWETA*, BHARTI V, MISHRA A

**DIT UNIVERSITY- MUSSOORIE,
DIVERSION ROAD, MAKKA WALA,
DEHRADUN, UTTARAKHAND 248009,**

Email: shwetapaliwal284@gmail.com

After gaining recognition successfully in the field of speech recognition and computer vision, Artificial Intelligence is on its way to change the world of pharmaceuticals. Ranging from efficient diagnostic algorithm to finely tuned surgical robots, Artificial Intelligence (AI) has emerged as a successful technology which was just a theory concept of science fiction a few years back. In this study we have designed an AI based Chatbot- Druggy the Pharma Assistant which will tell about important rules and regulations that are required in the Pharmaceutical industry. A chat bot is an AI based software that simulates a chat in natural language with the user. The PYCHARM integrated development environment has been used to perform the coding along with Natural Language Processing (NLP) and Python. NLP provides the chatbots to understand the user's messages and responds them quickly. As a result, Druggy is able to answer the queries that has been asked by the user successfully. Chatbots have created better user experiences and is evolving the business of pharmaceuticals industries. Today the utility of Artificial intelligence has gone beyond the

use of biological predictions. With innovation on its way, Artificial Intelligence is heading towards for creating a new revolution in several domains of pharmaceutical industry.

PE-02: Hydrophilic matrix based dispersions for improved aqueous solubility of arteether

SHARMA S*, BAJWA N., BALDI A.

**DEPARTMENT OF PHARMACEUTICAL
SCIENCES AND TECHNOLOGY, MAHARAJA
RANJIT SINGH PUNJAB TECHNICAL
UNIVERSITY, BATHINDA-151001, PUNJAB,
INDIA.**

E-mail: shubhamsharmahappy420@gmail.com

Arteether, a well known antimalarial drug used in chloroquine resistant malaria, suffers from limitations like poor aqueous solubility and degradation in acidic environment. Solid dispersion of this drug by internalization of this hydrophobic drug in to matrix of a hydrophilic carrier may offer a suitable approach towards attaining higher aqueous solubility, greater dissolution and better bioavailability in comparison to drug alone. The aim of the present study is to improve the aqueous solubility of arteether by internalization of drug as solid dispersion. The problem of low solubility of arteether was addressed by preparation of solid dispersions of arteether with various hydrophilic polymers (PEG-6000 PVP K-30, Poloxamer-188, Poloxamer-407, HPMC E 15LV, HPMC K-100M, sucrose and mannitol). A maximum enhancement of 37.34 times in aqueous solubility of arteether was observed in solid dispersion by optimized weight ratio

of AE:PEG-6000:Poloxamer-407 using melting method. The solid dispersion were confirmed on the basis of DSC, FT-IR and XRD. This study has shown the successful approach of the development and optimization of various hydrophilic based polymers strategies leading to increased aqueous solubility, which may enhance oral bioavailability of this poorly water-soluble drug.

PE-03: Formulation and Development of antifungal liquid vaporizer for coastal area: A social innovative idea for society

KISAN CHATA*, VIVEKANAND

**HR PATEL INSTITUTE OF PHARMACEUTICAL
EDUCATION AND RESEARCH, SHIRPUR,
MAHARASHTRA-425405**

E-mail: dr.vkchatap@gmail.com

India is the seventh-largest country in the world and has highest coastline area near about 7,516.6 km (4,671 mi). One more factor that consistently affect is a humid environment. This is greatly favourable for growth and replication of large amount of fungus, molds and some bacterial species. Most of the sea population suffers a problem of such climatic condition which is somewhat unfavourable for human. Most diseases are due to fungal infections. The present societal approach is specifically based on eradication of such the fungal infections. Liquid vaporizer is an innovative, economical, eco-friendly approach specifically useful for peoples living in coastal areas which of high humid environment. Laboratory results satisfy the needs and totally inhibit the growth of fungus. Liquid

vaporizer worked as antifungal action agent in which essential oil produces a mild vapours leads to toxic effect to fungus (aspergillus). The mild vapours have no harmful effect on human health. Lavender, thyme, tea tree, etc. Oils are selected as single or in combination to test their antifungal and vaporization ability. A five day study reveals that this antifungal liquid vaporiser can inhibit as well as kill the growth of Aspergillus and alternaria species of fungi. So this is a social, novel and cost effective antifungal liquid vaporizer formulation for the benefit of society.

PE-04: Synthesis and Characterization of 2-D Carbon Backbone Based Hybrid Magnetic Nanocomposites for Selective Tumor Theranostics

DESHMUKH P. K*, MORE M. P

H. R. PATEL INSTITUTE OF PHARMACEUTICAL EDUCATION & RESEARCH, SHIRPUR

E-mail: pkdesh@gmail.com

The major objective of present research was exploration of graphene based magnetic nanocomposites as a unique platform for targeted and efficient therapy of tumors. Development of new one step method for fabrication of magnetically active graphene oxide nanocomposites using ferrofluid which have more magnetization ability as compared reported nanocomposites using other method. Apart from therapy, the conjugated metal nanoparticle present in magnetic nanocomposites will also act as contrast agent, which can be employed for imaging the tumor as well as to produce local hyperthermia which will lead to efficient inhibition of tumor growth. On the technical front, the objective of proposed research includes development of simple one pot method for fabrication of graphene magnetic nanocomposites. These

two objectives can together pave pathway for developing less time consuming, cost effective method for fabrication of magnetic nanocomposites.

PE-05: Sports Pharmacy – A New Horizon in Pharmacy

NAHA.A*, RAMNARINE SINGH.R, BANSAL.P, C NAYAKV, GOUD.S

MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES, MAHE, MANIPAL KARNATAKA-576104

E-mail: sivakumar.k@learner.manipal.ed

In Sports the use of prohibited substance or prohibited methods or breaking Anti-Doping Rules Violations (ADRV) is termed as Doping. Anti-Doping Administrative Management System (ADAMS) has reported an average increase of 5.81% per year in the number of overall samples analysed (Olympic Sports and Non-Olympic Sports) for Anti-doping tests over the last 15 years (2003-2017). Since Mexico-1968 Olympic to Pyeongchang-2018 Olympic, 140 medals were stripped from sports persons due to Adverse Analytical Finding (AAF) at various sports. In sports, there are seven broad classes of substance that are categorized under doping. Several Anti-Doping organizations like World Anti-Doping Agency, National Anti-Doping Agency working together to prevent doping from sports, providing equal chance to each sports person and to protect health of the athletes, Court of Arbitration for Sport (CAS) is the final court appeal for any National Anti-Doping Organization or any athlete or stakeholders who are breaking the ADRV. Pharmacists are playing an important role in sports by counselling athletes, advising physician and athletic personnel, educating the public effect of Anti-Doping. Sports Pharmacist with their knowledge and expertise can contribute immensely for spreading awareness about anti-doping practices among sports person and hence there is need to develop the concept of Sports Pharmacist in Indian Pharmaceutical Arena.

PE-06: Sustainable Growth and Lutein Production from Chlorella Species using Carbon Nanosheets as Platform.

AGARWAL A*, RAI M P, MUKHERJEE M AMITY UNIVERSITY, NOIDA, 201301

E-mail: agarwalaksh24@gmail.com

The development of an economic route for the enhanced production of lutein from microalgae biomass using carbon nanosheets (CNS) as platform. Hydrothermally synthesized CNS were introduced into the algal culture medium to enhance the growth of algae via photoautotrophic cultivation. Carotenoid content was extracted using novel protocol. For 1 g of algae biomass 2.5 ml of ethanolic KOH 2 M and 10 ml of DCM were added, sonicated, centrifuged and supernatant was collected. The organic phase was then dried using a rotary evaporator, the residue was analyzed by HPLC. Cell growth and carotenoid content of microalgae culture were examined via measuring the optical density at every alternate day using spectrophotometer. The highest lutein levels (24 mg L⁻¹) were found in *C. sorokiniana*. Other carotenoids like lycopene, α -carotene, β -carotene were also produced in the algal species at lesser concentrations than lutein. Identification of carotenoids was achieved by absorption spectrum and the retention time with known standards. The incorporation of CNS into the algal cultivation procedures offers a synergistic route for simultaneous biomass production, thereby, presenting a sustainable alternative way for the extraction of various bioactive compounds. These bioactive compounds play pivotal roles in prevention of several human diseases and health conditions, e.g., cancer, cardiovascular problems, cataract etc."

PE-07: Regulatory

Requirements For Good storage and distribution Practices for Pharmaceutical in European Union

BHASKARAN J*, M.P. VENKATESH

JSS COLLEGE OF PHARMACY, SS NAGAR, MYSURU, KARNATAKA-570015,

E-mail: bhaskaran7j@gmail.com

Distribution is an important activity in the integrated supply-chain management of pharmaceutical products. Good Pharmaceutical Storage Practices are often accompanied by the concept of Good Distribution Practice (GDP). In this regard just like GDPs, GSPs is also a part of the Quality Management System. To maintain the original quality of pharmaceutical products, every party active in the distribution chain has to comply with the applicable legislation and regulations. Good Storage Practices (GSPs) also play an integral role in various Pharmaceutical and Pharmacovigilance-oriented companies, organizations and institutions. Every individual in the pharmaceutical industry is responsible to maintain drug substance or drug product for its identity, strength, quality and purity. Every activity in the distribution of pharmaceutical products should be carried out according to the principles of GMP, good storage practice (GSP) and good distribution practice (GDP) as applicable. All drugs should be stored at stipulated temperature areas, protected from excessive light, dust, and humidity. The loss of potency during the storage may lead to decrease in the efficacy of the drug product. In this particular article, the Good Distribution and storage practices with respect to European Union are discussed and specific storage conditions from the proposed EU Guidelines were highlighted.

PE-08: Perspective, perceptions and

promulgation of biosimilars: a questionnaire based study to assess and understand the current challenges of biosimilars to the potential and intended users

BHARDWAJ KRISHAN KUMAR*^{1,3}, BANGARURAJAN K², NAVED TANVEER³, RAJPUT SATYENDRA KUMAR^{3,4}

1 CGO COMPLEX NO-1, CENTRAL DRUGS STANDARD CONTROL ORGANIZATION, NORTH ZONE, NEAR HAPUR CHUNGI, GHAZIABAD, 2 CENTRAL DRUGS STANDARD CONTROL ORGANIZATION, FDA BHAWAN KOTLA ROAD NEW DELHI-110002 3 AMITY INSTITUTE OF PHARMACY, AMITY UNIVERSITY NOIDA- 201313, UTTAR PRADESH

4 AMITY INSTITUTE OF INDIAN SYSTEM OF MEDICINES, AMITY UNIVERSITY, NOIDA- 201313, UTTAR PRADESH

Email: krishan.bhardwaj9@gmail.com

Biosimilar, a copy of reference biological product, is making a buzz across the globe for its upper edge therapeutic usage. FDA approves the products as biosimilar or interchangeable. A product is called an interchangeable when it shows no dissimilarity to the reference product and gives the same clinical result in the patient. According to the market research report published by P&S Intelligence, biosimilars market is expected to generate \$26.7 billion revenue by 2024, advancing at a CAGR of 29.6% during the forecast period. The market is majorly driven by rising prevalence of chronic diseases, increasing investment in research and development (R&D) activities by biopharmaceutical companies, extensive pipeline of biosimilars, growing geriatric population, and inexpensive nature of biosimilars as compared to reference drugs. India, being strong in generics have opportunity for biosimilars as the biological products have gone off patent. The first biosimilar to medicine Omnitrope, was approved in Europe

by EMA (European Medicines Agency) in year 2006. Till date countries like US, China, Japan, India and many more have generated regulatory guidelines for biosimilars. Current study addresses the issues and challenges faced by Industry and regulators with their potential solutions and recommendations.

PE-09: Smart Approach for Drug Delivery : Niosomes

SINGH PANWAR RAJEEV*, MISHRA SHUBHAM, REHMAN FAISAL, SINGH SIDDHARTH

FACULTY OF PHARMACY, DIT UNIVERSITY DEHRADUN, UTTARAKHAND-248009

Email: Panwarrajeev93@gmail.com

In the field of novel drug delivery system niosome are one of the best approaches for delivering the drug into the body. Niosomes are lamellar structure which consist bi-layer of non-ionic surfactant vesicle in which drug is incorporated into the vesicle with incorporation of cholesterol or other lipids. They are similar to liposomes but due to the high chemical stability and economy this feature makes them preferred than liposomes. The size range of niosomes lies between 10-1000nm which better the therapeutic index of the drug. They are formed in such a way that hydrophobic and of the surfactant molecule developed a bi-layer while hydrophilic ends of the surfactant molecule goes into the outward direction. The hydrophilic drug entrapped in the centre of the niosome portion while hydrophobic drugs entrapped into the non-polar region of the formulation the feature defines the amphiphilic property of the niosomes. Surfactant improves the drug efficacy which enhances the bioavailability of the drug like nimesulide, ketoconazole, bleomycin etc.

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Abhijeet Ojha	OA21	Prachi Raikar	OC06
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M.P. Venkatesh	OA04	V Kusum Devi	OA08

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Bhaskaran J	PE07	Rohit	PB15
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Mayur Patel	PA71	Udai Prakash	PA38
Megha	PA80	Vaibhav Semwal	PD05
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AWARDS & RANKINGS



COURSES OFFERED

Diploma

Diploma in Hotel Management (DHM)
Diploma in Pharmacy (D. Pharm.)
Diploma in Engineering (Polytechnic)

Under Graduation

BAMS | Nursing | B.Tech | B.Arch | Bachelor in Design
B.Pharm. | BBA | B. Com (Honours) | BCA
B.Sc. (IT) | B.Sc. (Agriculture)
B.Sc. (Forestry) | B.Sc. (Horticulture)
B.Sc. (Microbiology) | B.Sc. (Food Tech.)
B.Sc. (PCM) | B.Sc. (CBZ) | B.Sc. (Tourism)
Bachelor of Hotel Management
Bachelor of Fashion Designing
Bachelor of Journalism & Mass Comm.
Bachelor in Hospital Administration

Post Graduation

M.Tech | MBA | MCA | M.Pharm. | M.Sc. (Agronomy) | M.Sc. (Physics)

Vocational Courses

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College of Pharmacy Dehradun

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- ▶ B.PHARMA (4 YEARS)
- ▶ D.PHARMA (02 YEARS)

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OUR VISION

- ◆ To be the best pharmacy college in India by imparting excellence in pharmacy education and to empower each student to succeed in global competitive environment.
- ◆ To aim at inculcating the spirit of high ambitions, healthy attitudes, discipline and multi-dimensional excellence in the students.

OUR MISSION

- ◆ Inculcating the timeless value of caliber, competence, confidence in budding pharmacist toward better healthcare of the society.
- ◆ To encourage high quality research in drug designing & drug discovery in collaboration with pharmaceutical industries.
- ◆ To implement modern pedagogical methods in class room and laboratories for improving teaching and learning process.
- ◆ Providing a holistic environment that focuses on the intellectual, spiritual and moral development of students in committing themselves to the healthcare services and need

INFRASTRUCTURE & FACILITIES



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ACTIVITIES & EVENTS



Teacher's Day Celebration



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Contact

Address

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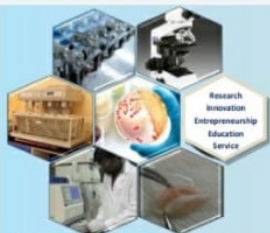
Courses

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B.Pharm.

D.Pharm.

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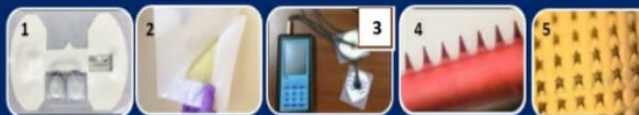
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- Research grant from Baba Atomic Research Centre, Govt. of India.
- Collaboration with global Pharmaceutical Industry.
- Collaboration with Premier Universities across the world.
- Technology transfer, Out-licensing and Commercialization.

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- Biophysical Approaches for Treating Health Disorders
- Skin Research
- Brain Research
- Lipid Based Drug Delivery
- Nanotechnology
- Drug Delivery Systems to Modulate ADME of Therapeutic Agents
- Physical Chemistry of Therapeutic Agents
- Sensory Research
- Microbiome and Health
- Biosimilars Research



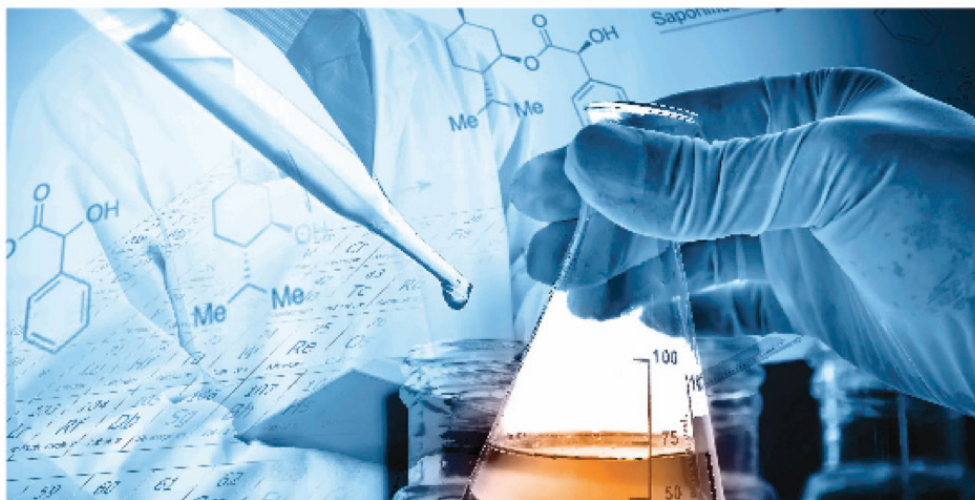
IDBR, in collaboration with Dayananda Sagar University (DSU) Bengaluru, offers PhD program in Life Sciences and Pharmaceutical Sciences.

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Welcome to Prakruti College of Pharmacy :

The PRAKRUTI College of Pharmacy were established UNDER Minhas Education Trust KORATAGERE on 30 JUN 2016. Our institution has been approved by Pharmacy Council of India and Govt of Karnataka, and is highly equipped and advanced Infrastructure. The College follows a problem-based, student-centred curriculum.

Institute is leading by Mr. ABHISHEK KUMAR SINGH, A Pharmacy Graduate and Postgraduate from Rajiv Gandhi university of health science Bangalore. Has more than 8 years of Teaching and Industrial experience in Pharma. Core area of research includes Solid oral, Parenteral, Semisolid and Ophthalmic and dermal formulation design. Worked as a Research Associate in Kernwell Biopharma PVT LTD in Research and development department(R&D) from 2011 to 2016. Is a member of the various Pharma associations like Indian Pharmacy Association (IPA), Association of Pharmaceutical teachers of India (APTI), Indian Pharmacy graduate association (IPGA). Presently Principal of Prakruti College of Pharmacy, Koratagere, Tumkur karnataka

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Mob-9844276067
pharmacy.prakruti@gmail.com



Contact us : Mrs. Monika Sabharwal, Managing Editor, IJPSR

1117, Sector 12A, Panchkula, Haryana 134112

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