



AICTE Sponsored



**Two Days National e - Conference
on**

**“An Alternatives to Animal Testing's: Replacement,
Reduction, Refinement, Rehabilitation,
Reuse and Recreation (6 Rs) Strategies
to Address Current Scenario”**

13th - 14th July, 2020

Abstract Book



Organized By

LAUREATE INSTITUTE OF PHARMACY

Kathog, Tehsil- Jawalamukhi, District- Kangra Himachal Pradesh
Pin-176031

E-mail: contactlaureate@gmail.com, Website : www.laureateinstitute.in

Contact : 09218428040, 09805676721, 09418028040, 7018933755

About Conference

Currently, the arena of an alternative method to animal experimentation has been rising and diversifying, and it has reached out to many other disciplines. As per regulatory guidance the term alternative methods (6 Rs), because of their human relevance, and after extensive validation, several 6 Rs methods in the area of pharmacology and toxicology have been adopted in documents. The continuing advancement in the field of In-vitro methods, like cell line studies, enzymatic analysis, hybridoma technique along with HTS method, and high-content imaging methods, simulation technique (in-silico models) and advanced knowledge in the fields of biology system, protein interaction, and gene expression patterns, have opened up new prospects, as especially in the field of pharmacology and toxicology, to investigate pathway alteration in disorder and human-relevant targets. Noteworthy, methods of 6 Rs are becoming an essential element in the whole field of biomedical research, from its most fundamental aspects to its daily applications. Today, method of 6 Rs represent a multi-disciplinary scientific area comprising animal science, basic biology, test development, pharmacology, toxicology, and regulatory practices, as well as ethics and behavioral sciences. It is the notion that the use of alternative animal testing has been proposed to overcome some of the drawbacks associated with animal experiments and circumvent the unethical procedures. The goal of this conference is to congregate experts from high threshold research areas for Pharmacology & Research to highlight the aspects of the 6 Rs concept for the relational use of experimental animal. This conference, aside from providing a way to exchange new hard-won knowledge and experiences, develop new ideas and bravely overcome challenges in the area of in-vivo testing. A clear understanding of the advantages and limitations of 6Rs approaches and animal models will be transmitted to all target groups.

Chief Guest



Sh. Col. B Venkat
Director,
Faculty Development Cell,
AICTE, New Delhi

Chief Patron



Prof. (Dr.) Ran Singh
Managing Director
Laureate Institute of Pharmacy,
Kathog, Jawalamukhi,
Distt. Kangra, H.P.

Local Organizing Committee

Chief Patron: Dr. Ran Singh,
Patron: Dr. Meera Singh
Programme Coordinator: Dr. M.S. Ashawat
Organizing Secretary: Dr. Vinay Pandit
Convener: Mr. Shiv Kr Kushawaha
Prof. C.P.S Verma

Eminent Speakers



Dr. Meera Sumanth
Professor & Head
Dept. of Pharmacology,
V.V. Puram College
of Pharmacy(KIMS College)
Bangalore



Dr. Sunil Sharma
Professor
Dept. Pharmaceutical Science
Guru Jambheshwar University
of Science & Technology Hisar



Dr. Rajendra Guleria
Dean Student Welfare
Himachal Pradesh Technical
University, Hamirpur



Dr. Kumud Kant Awasthi,
Associate Professor & Head
Dept. of Life Sciences,
Vivekananda Global University, Jaipur



Dr. Sanjay Mishra
Associate Professor & Scientist
KLE, College of Pharmacy, BSRC
Belagavi, Karnataka

Scientific/ Report Committee

In-charge: Prof. Amardeep Ankalgi
Members: Ms. Pooja, Ms. Upasana, Mr. Ajay,
Ms. Astha, Ms. Neha, Ms. Anchal

Stage Committee

In-charge: Mr. Pravin Kumar
Members: Ms. Rinu Rana, Ms. Archana Choudhary,
Mrs. Arti Devi, Mrs. Kamaya Jindal, Mrs. Dimple,
Dr. Shubham, Mr. Gourav Awasthi,

Registration/ Certificate Committee

In-charge: Mr. Shammy Jindal
Members: Mr. Tarun Kumar Sharma, Mr. Nikhil
Ms. Shelly Sharma,

IT Cell Committee

In-charge: Mr. Nishant Gautam
Members: Ms. Shelly Sharma, Mr. Raghu Nand

Press and Media committee

In-charge: Mr. Dev Raj
Members: Mr. Tarun Sharma, Mr. Mohit Sharma



Laureate Institute of Pharmacy

(Approved by PCI & AICTE, New Delhi and H.P.Govt.)

Affiliated to Himachal Pradesh Technical University, Hamirpur

V.P.O Kathog, Tehsil Jawalamukhi, Distt. Kangra, H.P. Pin Code 176031

Prof. (Dr.) Ran Singh
Managing Director
Laureate Institute of Pharmacy
Kathog, Tehsil Jawalmukhi, Distt. Kangra HP



MESSAGE

On behalf of the parent institute, It gives me immense pleasure to announce that the forthcoming AICTE sponsored two days national e-conference on “An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies to Address Current Scenario” is going to organize by Laureate Institute of Pharmacy, Kathog, HP.

Laureate Institute of Pharmacy was established in the year 2007 with the vision to inculcate professionalism with good human characters in our students .The upcoming two days conference is another step in this endeavor.We are determined to deliver quality pharmaceutical education with respect to international standards. In addition, management is committed to provide full phased facilities to post graduate and PhD scholars to carry out their researches.

This e-conference will provide common platform to research scientists, industrial experts and academicians to share their views and expertise about alternative approach of animal experimentation which is basis of preclinical studies in drug discovery. Moreover , eminent resource person will acquaint the participants about CPCSEA guidelines.

I here by welcome you for your participation in the e-conference being organized by our institute and wish you happy learning experience.

Prof. (Dr.) Ran Singh
Chief Patron, AICTE e-conference

LAUREATE EDUCATIONAL SOCIETY

Brance Peth, Bharari, Shimla-171001 (H.P.)

Dr. (Mrs.) Meera Singh

Executive Secretary

Laureate Educational Society



MESSAGE

I am glad to know that Laureate Institute of Pharmacy is organizing e-conference on “AICTE sponsored two days national conference on “An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies to Address Current Scenario” on 13th and 14th July 2020. The theme of the conference is appropriate as it covers basic concepts of animal experimentation and ethical practices to the participants. It also imparts the knowledge of international practices and modern advancement in pharmacological screening of new chemical entity.

I am happy to know that undergraduate, post graduate and PhD scholars across the countries are going to participate online in the conference to widen the horizon of knowledge that will directly or indirectly help in health system.. I wish this event a huge success.

A handwritten signature in black ink, appearing to be 'M.S.' or similar initials.

Dr. Meera Singh
Chief Patron, AICTE e-conference



Laureate Institute of Pharmacy

(Approved by PCI & AICTE, New Delhi and H.P. Govt.)

Affiliated to Himachal Pradesh Technical University, Hamirpur

V.P.O Kathog, Tehsil Jawalamukhi, Distt. Kangra, H.P. Pin Code 176031

Prof. (Dr.) M.S. Ashawat

Director cum Principal

Laureate Institute of Pharmacy

Kathog, Tehsil Jawalmukhi, Distt. Kangra HP

MESSAGE

We take great honor and pleasure to welcome you to AICTE sponsored two days national e-conference on “An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) on 13th and 14th July 2020. Pharmacological screening is paramount importance in new drug development. The knowledge of in vitro and in-vivo animal experimentation is essential for both undergraduate, postgraduate and PhD student. Due to CPCSEA guidelines and modern advancement in technology, we are adopting alternative approach to animal studies like cell lines, In-silico drug design and quantitative structure-activity relationships (QSARs) that not only help in ethical practices but also produce reliable, accurate, and precise results that can be further utilized in several scientific studies. Another advancement, Human patient simulators are strikingly lifelike, high-tech tools that offer hands-on medical training without harming animals. Heartfelt gratitude is extended to AICTE, India for providing us the opportunity to organize this event and for all the support and encouragement which have come a long way in framing this event. I would like to thank pharmacy college across the country and all the participants for making this e-conference successful.



Prof. Dr. M.S. Ashawat

Patron

AICTE

e-conference



Laureate Institute of Pharmacy

(Approved by PCI & AICTE, New Delhi and H.P. Govt.)

Affiliated to Himachal Pradesh Technical University, Hamirpur

V.P.O Kathog, Tehsil Jawalamukhi, Distt. Kangra, H.P. Pin Code 176031



Prof. (Dr). Vinay Pandit

Vice Principal & HOD (Pharmaceutics)

Laureate Institute of Pharmacy

Kathog, Tehsil Jawalmukhi, Distt. Kangra HP

MESSAGE

On behalf of faculty and staff of Laureate Institute of Pharmacy, I would like to thank AICTE and hosts of people for giving us an opportunity to conduct two days national e-conference on “An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies to Address Current Scenario” on 13th and 14th July 2020 through online mode. This conference will definitely disseminate the knowledge of recent techniques such as computer simulation and in vitro methods pharmacological screening methods to the participants. The theme addresses the current global scenario. I strongly believe that the knowledge gained by delegate will go a long way in addressing the new rational approach to pharmacological screening. The new techniques will definitely helps to raise our nation as global leader in the field of pharmaceutical sciences. I welcome all the participants and eminent resource persons for providing their valuable time to participate in this e-conference.

Prof. (Dr.) Vinay Pandit
Program Coordinator
AICTE e-conference



Laureate Institute of Pharmacy

(Approved by PCI & AICTE, New Delhi and H.P. Govt.)

Affiliated to Himachal Pradesh Technical University, Hamirpur

V.P.O Kathog, Tehsil Jawalamukhi, Distt. Kangra, H.P. Pin Code 176031

Shiv Kumar Kushwaha

Associate Professor

Department of Pharmacology

LIPh, Kathog- HP



Message

On behalf of Organizing committee, I would like to welcome all delegates and resource person to AICTE sponsored two days national e-conference on “An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies to Address Current Scenario” on 13th and 14th July 2020.

The goal of this seminar will be to congregate of experts from high threshold research area for teaching of different aspects of 6Rs concept. Noteworthy, 6Rs methods are becoming an essential element in the whole field of biomedical research, from its most fundamental aspects to its daily applications. A clear understanding of advantages and limitations of 6Rs approaches and animal models will be transmitted to all target groups. It in terms will encourage the participant to use alternative approach in drug discovery process. I thank all the participants, resource persons and AICTE for giving us an opportunity to host this event.

Shiv Kumar Kushwaha



Ph. : 92184-28040, 92184-05087

Laureate Institute of Pharmacy

(Approved by PCI & AICTE, New Delhi and H.P.Govt.)

Affiliated to Himachal Pradesh Technical University, Hamirpur

V.P.O Kathog, Tehsil Jawalamukhi, Distt. Kangra, H.P. Pin Code 176031

Organizing Secretary, AICTE e- conference

Professor, CPS Verma

Dean Student Welfare

Head, Department of Pharmacognosy

LIPh , Kathog, HP



Message

It is matter of immense pleasure to welcome all the participants and eminent resource persons to AICTE sponsored two days e-national conference on “An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies to Address Current Scenario” on 13th and 14th July 2020.

I am sure that this conference will provide the platform for academicians, research scholars and students to share their knowledge and experience about alternative approaches to human experimentation which in terms will help in their academic pursuits.

I wish the great success of event.

Convener, AICTE e-conference



Two Day National e- Conference On



**“An Alternatives to Animal Testing’s: Replacement, Reduction,
Refinement, Rehabilitation, Reuse, and Recreation (6 Rs)
Strategies to Address Current Scenario”**

Program Schedule

DATE	TIME	DETAILS
DAY 1 13-07-2020	10.00 to 11.00 am	<u>Welcome Address</u> Prof. (Dr.) Mahendra Singh Ashawat Director Cum Principal Laureate Institute of Pharmacy, Kathog, Jawalaji, Distt. Kangra, H.P.
		<u>Program details</u> Prof. (Dr.) Vinay Pandit Head of Dept. Pharmaceutics Laureate Institute of Pharmacy, Kathog, Jawalaji, Distt. Kangra, H.P.
		<u>Welcome Note address</u> Dr. Ran Singh Managing Director, Laureate Institute of Pharmacy, Kathog, Jawalaji, Distt. Kangra, H.P.
		<u>Key note Address</u> Col. B. Venkat Director, Faculty Development Cell AICTE, New Delhi
		Moderator: Prof. C.P.S. Verma (Dean & HOD)
	11.00 to 12.00 pm	Lecture Session I Topic: “Innovation in Phytopharmacology” Dr. Sanjay Mishra Associate Professor & Scientist, KLE, College of Pharmacy & (BSRC)Nehru Nagar, Belagavi, Karnataka.
12.00 to 12.15 pm	Break	
12.15 to 1.15pm	Moderator: Mr. Shiv Kr. Kushawaha (Asso. Prof., & Head)	

		Lecture Session II Topic: Alternating Animal Testing Dr. Meera Sumanth Professor & Head, Department of Pharmacology, V.V Puram College of Pharmacy, (KIMS College), Bangalore.
	03.00 to 06.00 pm	e- Poster Presentation

DAY 2 14-07-2020	10.00 to 11.00 am	Moderator: Dr. Amardeep Ankalgi (Prof. & Head) Lecture Session III <i>Topic: "CPCSEA Guideline for Laboratory Animal"</i> Dr. Rajendra Guleria Dean Pharmacy & Students Welfare, H.P. Technical University, Hamirpur, H.P.
	11.00 to 12.00 pm	Moderator: Mr. Shiv Kr. Kushawaha (Asso. Prof., & Head) Lecture Session IV <i>Topic: "Research ethics for laboratory animals:Scientific validity and the guidelines"</i> Dr. Kumud Kant Awasthi, Associate Professor & Head Department of Life Sciences, Vivekananda Global University Jaipur.
	12.00 to 12.15 pm	Break
	12.15 to 1.15 pm	Moderator: Dr. Amardeep Ankalgi (Prof. & Head) Lecture Session V <i>Topic: "Animal use in Pharmacological Experiments in Teaching and Research"</i> Dr. Sunil Sharma Professor (Pharmacology), Department of Pharmaceutical Sciences, Guru Jambheshwar University of Sciences and Technology,Hisar, Haryana.
	1.30 to 2.30 pm	Valedictory Function <u><i>Program details</i></u> Prof. (Dr.) Vinay Pandit Head of Dept. Pharmaceutics <u><i>Welcome Address</i></u> Dr. Ran Singh Managing Director, <u><i>Welcome Address</i></u> Prof. (Dr.) Mahendra Singh Ashawat Director Cum Principal <u><i>Key note Address</i></u> Prof. (Dr.) Parveen Bansal Joint Director, Baba Farid University of Health Science Result Announcement <u>Releasing the feedback link and certificate</u>

**AICTE Sponsored Two Days National e-conference on “An
Alternatives to Animal Testing's: Replacement, Reduction,
Refinement, Rehabilitation, Reuse and Recreation (6 Rs)
Strategies to Address Current Scenario”**

(13& 14 July 2020)

Lecture Sessions:

SR. NO	NAME OF SPEAKER	DESIGNATION	AFFILIATING ORGANIZATION	e-LECTURE TOPIC	PAGE NO.
1.	Dr. Sanjay Mishra	Associate Professor and Scientist	KAHER's Basic Science Research Center [BSRC], KLE Academy of Higher Education and Research [KLE University], Nehru Nagar, Belagavi - Karnataka, INDIA.	Innovations in Phytopharmacology	1-2
2.	Dr, Meera Sumanth	Professor and Head , Department of Pharmacology	Visweswarpura Institute of Pharmaceutical Sciences, Bengaluru, Karnataka	Alternative to Animal Testing	3
3.	Dr. Rajendra Guleria	Dean Pharmacy and Student Welfare	Himachal Pradesh Technical University, Hamirpur, Himachal Pradesh	CPCSEA Guidelines	4
4.	Dr.Kumud Kant Awasthi	Associate Professor & Head Department of Life Sciences	Vivekananda Global University Jaipur.	Research ethics for laboratory animals: Scientific validity and the guidelines	5
5.	DR. SUNIL SHARMA	Professor (Pharmacology)	Department of Pharmaceutical Sciences, Guru Jambheshwar University of Sciences and Technology, Hisar, Haryana.	Animal use in Pharmacological Experiments in Teaching and Research	6

LIST OF ABSTRACTS:

Sr. No	Abstract Code	Topic & Author /Authors	Affiliating Institute	Page No.
1.	6RsAICTE -EA-001	COVID-19 Amrendrakumar	Narayan Institute of Pharmacy, JamuharSasaram, Bihar	7
2.	6RsAICTE -EA-002	A Review: An Alternative to Reduction of Animal Testing Ankita Sharma*	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	7
3.	6RsAICTE -EA-003	Simultaneous estimation of Methotrexate and Hydroxychloroquine Sulfate in Bulk drug formulation by using UV-Visible Spectroscopy. Anupam Sharma, Arti Devi, Amar Deep Ankalgı, M.S.Ashwat.	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	8
4.	6RsAICTE -EA-004	A Review: An Alternative to Replacement of Animal Testing Archana Gautam*, Dev Raj, Vinay Pandit	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	8-9
5.	6RsAICTE -EA-005	An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies Priyanka Chandolia, Puneet Kumar	Maharaja Ranjit Singh Punjab Technical University, Bathinda (Punjab); India	9
6.	6RsAICTE -EA-006	Need for alternatives to animals in experimentation: An Indian perspective. Arti Rana*	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	10
7.	6RsAICTE -EA-007	Non-animal approaches to address the beneficial effect of Phospholipase A2 group IIA inhibitors from <i>Acacia sumain</i> obesity management Nikita N. Kanbarkar; Sanjay Mishra	KLE's Basic Science Research Center, KLE Academy of Higher Education and Research, Belagavi, Karnataka	10-11

8.	6RsAICTE -EA-008	Pre-clinical and Clinical Trials Study Navdeep Singh*, ShiviSondhi, Vinay Pandit, Shammy Jindal	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	11-12
9.	6RsAICTE -EA-009	Repurposing of Approved drugs against SARS-CoV-2 through Molecular Docking Tools Rohit Bhatia* ^{1,2} , Raj Kumar Narang ¹ , Ravindra Kumar Rawal ³	¹ Department of Pharmaceutical Chemistry, ISF College of Pharmacy, Ferozpur G.T. Road, Moga-142001, Punjab, India	12-13
10.	6RsAICTE -EA-010	Current scenario an alternative animal testing ShiviSondhi*, Navdeep Singh, Vinay Pandit, Shammy Jindal	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	13
11.	6RsAICTE -EA-011	Alternatives to animal testing Kiran Saini	Department of Pharmacology, ASBASJS Memorial College of Pharmacy,Bela, Ropar, Punjab	14
12.	6RsAICTE -EA-012	<i>In silico</i> Studies of Astragaloside from Trigonotispora Cabbage against SARS CoV-2 Main Protease Megha Gupta ¹ , Sandra Jose ² , Dr.G.N. Nirmala*	Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology Vels University, Chennai ²	14-15
13.	6RsAICTE -EA-013	COVID-19 Looking beyond today and tomorrow towards new normal Mihir otia	L.J. institute of pharmacy, Ahmedabad Gujrat	15
14.	6RsAICTE -EA-014	'6 Rs' strategies to address current scenario' Neha Sharma*, Tarun Sharma , Dr Vinay Pandit , Dr. M.S. Ashawat	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	16
15.	6RsAICTE -EA-015	Multi-component analysis of Lamivudine& Tenofovir in bulk drug by UV-Visible Spectrophotometer	Laureate Institute of Pharmacy, Kathog, Distt.	16-17

		Shweta Sharma, Pooja Kaushal, Amar Deep Ankalgi, M.S Ashawat	Kangra, Himachal Pradesh-176031	
16.	6RsAICTE -EA-016	Nanoparticle in cancer: a Nobel concept Shivam Malhotra*, Archana Chaudhary, Tarun Sharma, Vinay Pandit	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	17
17.	6RsAICTE -EA-017	Gallic acid: A polyphenol against Tumour Management V.Sandhiya	C.L.BaidMetha College of Pharmacy, Thoraiakkam, Che nnai	18
18.	6RsAICTE -EA-018	Eudragit based oral polymeric nanoparticles for the improvement of bioavailability and antioxidant activity of resveratrol <u>Rahul Hasija</u> ^{a,b} , Sundeep Chaurasia ^a , Swati Gupta ^{b*}	^a Formulation Research and Development, Mankind Research Centre, Unit-3, Plot No. 145, Sector-7, IMT Manesar, Gurgaon 122 050, INDIA	18-19
19.	6RsAICTE -EA-019	Physiologically-based biokinetic model a conceptual substitute to animal testing in pre- clinical studies , SoodRatima* ¹ , Virmani Mayank * ² , Gupta Shreya* ³	Department of Pharmacy Practice, I.S.F. College Of Pharmacy ,Moga ,India	19-20
20.	6RsAICTE -EA-020	An alternative to animal testing: 6Rs strategies Shavinderkumari*	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	20
21.	6RsAICTE -EA-021	An alternatives to animal testing's : replacement, reduction, refinement, rehabilitation , reuse and recreation (6rs) strategies to address current scenario Shivani Sharma*, Dr.Amar Deep Ankalgi, Mahendra Singh Ashawat	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	21
22.	6RsAICTE -EA-022	Pharmacist is the lifeline as mankind to the COVID-19 Simran	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	22

23.	6RsAICTE -EA-023	Impact of Immune Boosters in COVID-19 Mr. Yogendrakumar * ¹ , Shiv Singh ²	Ramnath singh institute of pharmacy and technology shitholigwalior (MP)	22-23
24.	6RsAICTE -EA-024	Alternative to animal testing-Replacement, Reduction, Refinement, Rehabilitation, Reuse, Recreation. Subash.S	Senghundhar college of pharmacy.	23
25.	6RsAICTE -EA-025	How to Reduce the Animal Testing: A Review Aanchal* , Ajay Kumar, Bhumika Thakur D Pharm 1st Year, Laureate Institute of Pharmacy Kathog H.P	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	24
26.	6RsAICTE -EA-026	Role of pharmacist in COVID-19 Public awareness program. Mr. Ankur Agarwal	Shri. Ramnath singh institute of pharmaceutical science and technology, sitholi, Gwalior	24
27.	6RsAICTE -EA-027	Replacement, reduction, refinement, rehabilitation, reuse and recreation (6rs) strategies to address current scenario Dheeraj Singh*, Dr. Amardeep Ankalgi	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	25
28.	6RsAICTE -EA-028	High time go for non animal testing approach Ankush Aggarwal, Ankita Sharma	Department of Zoology, University of Rajasthan, Jaipur, 302004, India Department of Zoology, Vivekanand Global University, Jaipur, 302017, India	26
29.	6RsAICTE -EA-029	6R: An ethical way to animal testing Ankita sharma, Ankush aggarwal, Kumudkantawasthi, Anjaliawasthi	Department of Zoology, University of Rajasthan, Jaipur, 302004, India Department of Zoology, Vivekanand Global University, Jaipur, 302017, India	26-27

30.	6RsAICTE -EA-030	Alternatives to Animal Experimentation Pramod Kumar, Pooja Kaushal, Amar Deep Ankalgi, M.S Ashawat	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	27
31.	6RsAITE- EA-031	Alternatives to Animal testing Sumitkumar.	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	27-28
32.	6RsAICTE -EA-032	Saving the Animals: They have Emotion Too. Shreya Kumar, Arunava Chandra Chandra, An	BCDA College Of Pharmacy & Technology, 78, Jess ore Road(S), Hridayapur , Kolkata - 700127	28-29
33.	6RsAICTE -EA-033	Animal research against Covid-19: An Overview. Arvind Singh Jadon and Poonam Bhadauriya An alternatives to animal testing's :	Gurukul Institute of Pharmaceutical Science and Research, Gwalior- 474001, Madhya Pradesh	29-30
34.	6RsAICTE -EA-034	Phonophoresis drug delivery system Mahajan Tejasvi , Jindal Shammi, Pandit Vinay, Ashawat M.S	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	30-31
35.	6RsAICTE -EA-035	An Alternatives to animal testing's: Replacement, Reduction , Refinement, Rehabilitation, Reuse and Recreation (6 RS) Strategies to Address current scenario Sonam* Vinay pandit, Archana choudhary	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	31

36.	6RsAICTE -EA-036	An Alternatives to animal testing's: Replacent, Reduction , Refinement, Rehabilitation, Reuse and Recreation (6 RS) Tanvi Guatam	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	31
37.	6RsAICTE -EA-037	Physiologically-based biokinetic model a conceptual substitute to animal testing in pre-clinical studies Virmani Mayank* ¹ , SoodRatima * ² , Gupta Shreya* ³	Department of Pharmacy Practice, I.S.F. College Of Pharmacy ,Moga ,India	32
38.	6RsAICTE -EA-038	Dark Side of Animal Testing and their Potential Alternatives Sheetal*, Uttam Kumar Mandal# An alternatives to animal testing's :	Maharaja Ranjit Singh Punjab Technical University, Bathinda – 15001, Punjab	32-33
39.	6RsAICTE -EA-039	Multi-component analysis of Atovaquone and Mefloquine hydrochloride in bulk drug by UV-Visible Spectrophotometer Sanyam Sharma*, Kamyra Jindal, Amar Deep Ankalgi, M.S Ashawat	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	33-34
40.	6RsAICTE -EA-040	An alternatives to animal testing's : replacement, reduction, refinement,rehabilitation, reuse and recreation (6rs) strategies to address current scenario Rohit Bharadwaj, Prof Dr. Satyendra Kumar Rajput	Amity institute of Pharmacy,Amity University, sector-125 Noida. (U.P)	34
41.	6RsAICTE -EA-041	Sebacinavermifera based bioformulation: an alternate to the sustainable phytopromotional production Kamal Jeet ^{1,2#} , Ashish Baldi ^{2*}	IKG Punjab Technical University, Jalandhar, Punjab-144603 2MRS Punjab Technical University, Bathinda, Punjab-151001	35

42.	6RsAICTE -EA-042	Topical Glycyrrhetic Acid as a Potential and Innovative Therapeutic Approach for Atopic Dermatitis Using BALB/c Mice Model Pravin Kumar ¹ , Dinesh Kumar Sharma ² , Mahendra Singh Ashawat ¹	¹ Laureate Institute of Pharmacy, Kathog, Jwalamukhi, H.P, India ² HIPR, Dehradun, Uttarakhand, India	35
43.	6RsAICTE -EA-043	Animal experimentation, welfare and scientific research Dipankerkashive*, Dr. Vinay Pandit Department of Pharmaceutics,	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	36-37
44.	6RsAICTE -EA-044	In Vitro Models for SARS-CoV-2 research Rinu Rana*, Mahendra Singh Ashawat	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	37
45.	6RsAICTE -EA-045	An Alternatives to animal testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 RS) Strategies to Address current scenario Adarsh Kumar*, Rinu Rana	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	37-38
46.	6RsAICTE -EA-046	Multicomponent analysis of emtricitabine and ritonavir by using RP-HPLC Aman Kapoor*, Amardeep Ankalgi, Upasana Thakur, M.S. Ashawat.	Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031	38
47.	6RsAICTE -EA-047	Organ-on-a-chip: An Alternative for Animals Studies in Drug Discovery Karan Wadhwa#, A C Rana	Institute of Pharmaceutical Sciences, Kurukshetra University, Kurukshetra, Haryana	39

AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies to Address Current Scenario”

LECTURE SESSIONS

Lecture Session-1

Dr. Sanjay Mishra

Associate Professor and Scientist

KAHER’s Basic Science Research Center [BSRC], III Floor, V. K. Institute of Dental Sciences Campus, KLE Academy of Higher Education and Research [KLE University], Nehru Nagar, Belagavi - 590010, Karnataka, INDIA.

Innovations in Phytopharmacology

The introduction of molecular biological models into phytopharmacology research is essential to get more detailed information on the underlying mechanisms of action of multivalent herbal plant preparations. By using new target directed pharmacological screening methods in combination with clinical trials, it will be possible to find a rational for synergistic effects of plant extract preparations. As shown on some examples, questions of the correct dosages, of dose dependent reversal effects of plant constituents and long-term therapeutic effects of Phyto preparations at low doses are waiting to be answered. The elucidation of these phenomena can help to rationalize phyto-therapy and to integrate it into an overall concept of modern medicine. In view to this approach, a study was performed for possible beneficial effects of *Terminalia arjuna* in experimentally induced model of colitis.

Inflammatory bowel disease (IBD), consists of two major forms: Crohn’s disease (CD) and ulcerative colitis (UC) with chronic and relapsing gastro-intestinal inflammation, characterized by diarrhea, stomach pain, blood in stool and associated with risk of colorectal cancer. *Terminalia arjuna* (TA) is documented to possess anti-inflammatory, antidiarrheal and antioxidant, antimicrobial and cytotoxic potential which could be beneficial for IBD treatment.

The study evaluated the cytotoxicity of TA hydroalcoholic extract (TAHA) against human colorectal adenocarcinoma cells. Its antimicrobial potential was evaluated against IBD clinical isolates [HM233, HM251, HM95, HM615]. The in-vivo TNBS induced rat colitis model was used to access its beneficial potential intestinal inflammation at doses (500, 250 and 125 mg/kg).

Dose-dependent cytotoxicity was observed in the study against colorectal adenocarcinoma cells having IC50 ($\mu\text{g/mL}$) values against COLO.205 and Caco2 respectively.

Minimum inhibitory concentration against the four bacterial isolates was 6 mg/ml, . TAHA treatment in colitis rats directed decreased DAI scores, macroscopic and histologic damage. It also resulted in reduced myeloperoxidase, malondialdehyde and nitric oxide level. Whereas, prevented depletion of plasma catalase, superoxide dismutase and glutathione level. In addition, TAHA treatment down-regulated the gene expression of pro-inflammatory mediators and displayed altered beneficial effect on fecal microbiota. Furthermore, enhanced plasma zinc level supported the beneficial effect of TAHA in colitis rats. The TAHA dose that produced most significant beneficial effect was 500 mg/kg.

To summarize this study, TAHA administration in rats, relieved the symptoms in TNBS induced colitis by reduced expression of pro-inflammatory cytokines and chemokine, decreasing oxidative stress, improvement in plasma zinc level and structure of gut microbiota. In-vitro cytotoxicity and antibacterial supports the *In-vivo* evidence.

Lecture Session-2

Dr, Meera Sumanth

Prof and Head, Dept of Pharmacology, Visweswarpura Institute of Pharmaceutical Sciences, 24th main, 22nd cross, BSK 2nd stage, Bengaluru 560 070

Alternatives to Animal

Any drug, pharmaceutical product, cosmetic product undergoes screening/testing in animals before it is approved for marketing, for its safety, efficacy, potency, pharmacokinetics (PK) and pharmacodynamics (PD). Traditionally these studies were done on animals like mice, rats, rabbits, guinea pigs, dogs, monkeys etc. With Prevention of Cruelty to Animals Act, 1960, CPCSEA (Committee for the Purpose of Control and Supervision of Experiments on Animals) is established in India, which follows the 6Rs -Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation strategies.

So, are there any alternatives to animal testing? Scientist looked for a suitable answer to this question and we have now, *in vitro* cytotoxicity done using MTT, colorimetric MTP, ATP, Neutral Red (NR) uptake assay, ELISA etc. Similarly, there are *In vitro* and *In silico* methods, simulated computerized models available as alternatives to animal testing. The talk will enlist and cover the benefits, disadvantages and limitations of these various alternative models.

But, till now, PK-PD studies for a drug needs animal usage.

Lecture Session-3

Dr. Rajendra Guleria

Dean Pharmacy and Student Welfare,

Himachal Pradesh Technical University , Hamirpur

CPCSEA Guidelines

The aim of the “Committee for the Purpose of Control and Supervision on Experiments on Animals” (CPCSEA) Guidelines is to promote ethical practices in biomedical and behavioral research, and testing with the basic objective of providing specifications that will enhance animal wellbeing and quality research. In India, various experimental animal models are used for conducting various pharmacological screening of new chemical entity and lead compound. Good Laboratory Practices’ (GLP) for animal facilities is intended to assure quality maintenance and safety of experimental animals used in laboratory. Hence, for proper and humanitarian use of animals in various experiments and researches, the Government of India on December 15, 1998 has constituted the CPCSEA under the ‘Ministry of Social Justice & Empowerment’. The CPCSEA has provided ‘Guidelines’ for laboratory animal facilities. It includes constitution, goal and function of CPCSEA bodies. The record keeping and stock registered maintenance of experimental animal in animal house . The duties of veterinarian at animal house and basic knowledge and formal training required by the veterinarian. Guidelines also include ethical animal handling practice and breeding of the animals. CPCSEA guidelines also consists of different anesthetic technique adopted in animal model and euthanasia techniques and disposal of sacrificed animals. It also includes housing facilities, sanitation and hygiene in animal house and protocol of animal transportation.

Lecture Session-4

Dr. Kumud Kant Awasthi,

Associate Professor & Head, Department of Life Sciences, Vivekananda Global University Jaipur

Research ethics for laboratory animals: Scientific validity and the guidelines

It is difficult to discuss the humane care and use of animals without concurrently balancing environmental enrichment for the animals and the goals of the biomedical research. Millions of animals are used in research and toxicity testing, including in drug, medical device, chemical, cosmetic, personal care, household, and other product sectors, but the species-appropriate environmental enrichment are yet to be adequately addressed. Experimentation on animals in course of medical research and education is covered by provisions of the Prevention of Cruelty to Animals Act, 1960 and Breeding of and Experiments on Animals (Control & Supervision) Rules of 1998, 2001 and 2006 framed under the Act. These are enforced by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), a statutory body under the Prevention of Cruelty to Animals Act, 1960. Indian guidelines for use of animals in research promotes the humane care and use of laboratory animals and strives to enhance animal well-being to express species-typical behaviors, the quality of research, and the advancement of scientific knowledge that is relevant to both humans and animals. It is mandatory that all institutions involved in animal research develop and abide by the ethical review processes which promote good animal welfare practices by ensuring that the use of animals at the designated establishment is justified.

Lecture Session -5

Dr. Sunil Sharma

Professor (Pharmacology), Department of Pharmaceutical Sciences, Guru Jambheshwar University of Sciences and Technology, Hisar, Haryana.

Animal use in Pharmacological Experiments in Teaching and Research

Animal Use in Pharmacological Experiments in Teaching and Research Medicines an important role in health care system and are being introduced in treatment after experimental evaluation. Animal experiments had played important great role in evaluation of pharmacological activity of newer compound. Not only that animal experimentation also played vital role in understanding the concept of pharmacology education at undergraduate and post graduate level of medical as well as pharmacy students. Thousands of laboratory animals are being used annually in educational institutes in various studies despite efforts by Indian Government and activists to reduce this number. There is a belief that pharmacology cannot be taught without experimentation in animals. However, with changing trends in teaching and research, it is felt that animals should not be sacrificed just to acquire skills and techniques of experimentation. Keeping in view guidelines by Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), suggest replacement, refinement and reduction in animal experiments. The committee also suggest rehabilitation of the experimental animals as an added measure for their care. In this changing scenario, developments of alternatives methods for evaluation of pharmacological potential are the need of the day.

AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies to Address Current Scenario”

ABSTRACT

DETAILS

(6RsAICTE-EA-001 to 6RsAICTE-EA-047)

6RsAICTE-EA-001

COVID-19

AmrendraKumar

Narayan Institute of Pharmacy, Jamuhar,Sasaram, Bihar

Abstract

Corona is the infectious disease caused by the most recently discovered corona virus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose. These symptoms are usually mild and begin gradually. Some people become infected but don't develop any symptoms and don't feel unwell. Most people (about 80%) recover from the disease without needing special treatment. Around 1 out of every 6 people who gets Corona becomes seriously ill and develops difficulty breathing.

Keywords: Corona, symptom and china

6RsAICTE-EA-002

A Review: An Alternative to Reduction of Animal Testing

Ankita Sharma*Department of PAQA

Laureate Institute of Pharmacy, Kathog , Distt. Kangra, Himachal Pradesh-176031

Email :- shabbuankita057@gmail.com

Abstract

The number of animals used in research has increased with the advancement of research and development in medical technology. Every year, millions of experimental animals are used all over the world. The pain, distress and death experienced by the animals during scientific experiments have been a debating issue for a long time. Besides the major concern of ethics, there are few more disadvantages of animal experimentation like requirement of skilled manpower, time consuming protocols and high cost.

Various alternatives to animal testing were proposed to overcome the drawbacks associated with animal experiments and avoid the unethical procedures. A strategy of 3 Rs (i.e. reduction, refinement and replacement) is being applied for laboratory use of animals. Different methods and alternative organisms are applied to implement this strategy. These methods provide an alternative means for the drug and chemical testing, up to some levels. A brief account of these alternatives and advantages associated is discussed in this review with examples. An integrated application of these approaches would give an insight into minimum use of animals in scientific experiments.

Keywords: medical technology, scientific, protocols, drawback and research

6RsAICTE-EA-003

Simultaneous Estimation of Methotrexate and Hydroxychloroquine sulfate in Bulk Drug Formulation by using UV-visible spectroscopy.

Anupam Sharma, Arti Devi, Amar Deep Ankalgi, M.S.Ashawat

Laureate Institute of Pharmacy, Kathog, Jawalamukhi, Himachal Pradesh, India.

Email id: anudec28@gmail.com

Abstract:- A simple, precise, accurate, cost effective UV Spectrophotometric method has been developed for the estimation of Methotrexate and Hydroxychloroquine sulfate shows highest λ_{max} at 303nm and 343nm. Beer's law (linearity response) was found over a concentration range of 3 -18 $\mu\text{g}/\text{mL}$ with good correlation coefficient ($r^2 = 0.9997$ and the values of standard deviation were satisfactory low and the recovery studies were close to 100%.

The Proposed Spectrophotometric method was validated as per the ICH Q1A (R2) guidelines. Hence this method can be safely being employed for the routine quality control analysis of Methotrexate and Hydroxychloroquine sulfate.

Keywords: Methotrexate, Hydroxychloroquine sulfate, Method Development, UV Visible Spectroscopy, Validation.

6RsAICTE-EA-004

A Review: An Alternative to Replacement of Animal Testing

Archana Gautam*, Dev Raj, Vinay Pandit
Department of Pharmaceutics

Laureate Institute of Pharmacy, Kathog, Distt Kangra, Himachal Pradesh-176031

Email : archnagautam567@gmail.com

Abstract

An animals are used every year in the United States for scientific and commercial testing. Animals are used to develop medical treatments, determine the toxicity of medications, check the safety of products destined for human use, and other biomedical, commercial, and health care uses. Research on living animals has been practiced since ancient times. Researchers used animal testing to obtained to the disease develops in the body.

The purpose is to raise some points for an understanding the ethics of using animals in scientific experiments. Present the various positions from scientific and moral perspectives establishing different ways of viewing animals to analyze the controversial of animal testing. Represents the process of animal testing as well as alternative studies to animal experiments.

Keywords: Represents, alternative and experiments.

6RsAICTE-EA-005

An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation (6 Rs) Strategies

Priyanka Chandolia, Puneet Kumar
Department of Pharmaceutical Sciences & Technology,
Maharaja Ranjit Singh Punjab Technical University, Bathinda (Punjab); India

Abstract

With the advancement of medical technology research and development the number of animals used in research has increased. Millions of experimental animals are used throughout the world annually. The suffering, discomfort and death felt by animals during laboratory studies have long been a subject of controversy. In addition to the major ethical concern, there are few more disadvantages of animal experimentation such as skilled labor requirements, time-consuming protocols and high costs. To attempt to resolve the risks associated with animal experimentation

and prevent unethical practices, different approaches to animal research were suggested. A strategy of 6 Rs (Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation) is implemented for the use of animals in the laboratory. To execute this technique specific approaches and alternate species are implemented. These methods provide an alternative means, up to some levels, for the drug and chemical testing. A brief account of these associated alternatives and benefits will be discussed along with examples in this review. The integrated implementation of these methods will offer insight into limited animal use of research studies.

Keywords: Alternative organism; Model organism; 6 Rs; Laboratory animal; Animal ethics

6RsAICTE-EA-006

Need for alternatives to animals in experimentation: An Indian perspective

Arti Rana* (Assistant professor) Department of Pharmacology,
Laureate institute of Pharmacy, Kathog, H.P, India

Abstract:

Introduction: Firstly, introduced the concept of 3Rs - Replacement, Reduction, and Refinement of animals in experimentation. India has long since accepted and adopted the 3Rs through the mandate given by the CPCSEA. They have also inculcated a fourth R, that of Rehabilitation for the animals used in experiments. With the development of 3D skin and eye models, industry is shifting to use these models to conduct local irritation and corrosion assays, which also have become a regulatory mandate in India. Such models are rapidly evolving and replacing animal studies either to reduce or minimize animal usage in research. Here, we discuss the current status in India on the utility of these models to replace animal studies. The number of animals used in research has increased with the advancement of research and development in medical technology. Every year, millions of experimental animals are used all over the world. Alternative approaches include in vitro test methods are fit for purpose of non animal experiments. Technical advances have changed the frontline somewhat, with in vitro and **in-silico** methods gaining more ground alternative approaches" are increasingly replacing animal models as predictive tools and it needs to be demonstrated. In India should become self-reliant in such technologies that support research activities, rather than depending on costly imported.

Keywords: technologies, research activities, regulatory, advancement and corrosion

6RsAICTE-EA-007

Non-animal approaches to address the beneficial effect of Phospholipase A2 group IIA inhibitors from *Acacia suma* in obesity management

Nikita N. Kanbarkar; Sanjay Mishra
KLE's Basic Science Research Center, KLE Academy of Higher Education and Research, Belagavi, Karnataka

Abstract

The present study effort has made to find out a novel therapeutic solution for the management of obesity by non-animal models. *Acacia suma* Roxb. (Fabaceae) is an Ayurvedic medicinal plant distributed in

Karnataka, Bengal and Bihar region. Phytoconstituents of *Acacia suma* were retrieved from ChEIB databases and queried for phospholipase A2 group IIA inhibitors. Out of 29 reported compounds three were identified in modulating phospholipase A2 group IIA inhibitor their drug likeness score and probable gene expression was identified. Docking study was performed using autodock4.0 to predict binding affinity of phytoconstituents with phospholipase A2 group IIA inhibitor and compared with clinically proven drug ‘Orlistat’ as lipase inhibitor. The respected pathway to show networking between phytochemical and target were analyse by Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway analysis for regulated genes. Further, in silico findings were validated for hydroalcoholic extract of *Acacia suma* by In vitro lipase inhibition assay. Molecular docking result revealed the presence of three flavonoid compounds for lipase inhibition activity namely:(1)(5S,7R,8R,9R,10S)-(-)-7,8-seco-7,8-oxacassa-13,15-diene-7,17-diol (2) Fisetinidol-(4 α ,6)-gallocatechin and (3) Quercetin4'- O- α - L- rhamnopyranosyl- 3- O- β - D- allopyranoside. However, Quercetin4'- O- α - L- rhamnopyranosyl- 3- O- β - D- allopyranoside was predicted to possess the highest docking score i.e. -7.6 Kcal/mol with phospholipase A2 group IIA. The in vitro findings revealed significant anti-lipase activity with IC₅₀ value 46.07 μ g/ml. Hence, the in silico and in vitro approaches has presented strong binding affinity and significant lipase inhibition activity respectively which supports anti-obesity potential of heart wood hydroalcoholic extract of *Acacia suma*. These non-animal models will light the future scope of study findings to design effective and safe medicine to control and prevent obesity.

Keywords: Docking, *Acacia suma*, phytochemical, affinity and findings.

6RsAICTE-EA-008

Pre-clinical and Clinical Trials Study

Navdeep Singh*, Shivi Sondhi, Dr. Vinay Pandit, Shammy Jindal
Department of Pharmaceutics.

Laureate Institute of Pharmacy, Kathog, Distt Kangra, Himachal Pradesh-176031.

Email: arunava.eid@gmail.com

Abstract

Clinical trials are scientific studies conducted to find better ways to prevent, screen, diagnose, or treat disease. The purpose of clinical trials is to answer scientific questions. Therefore, these studies follow

strict, scientific standards which protect patients and help produce reliable clinical trial results. The overall procedure is divided into a series of stages known as phases of clinical trials. Clinical testing on humans can only begin after a pre-clinical phase, involving laboratory studies (in vitro) and tests on animals, which has shown that the experimental drug is considered safe and effective. The principles for researchers are used to perform the clinical trials with required procedure. The study is done on the basis of Phase-1, Phase-2, Phase-3 and Post Marketing Surveillance Study (Phase-4) trials. The preclinical trials are performed in several years, 1 trials for months, Phase-2 trials for month to years study, Phase-3 trials for years to decades and Phase-4 trials performed with ongoing process. So the Every clinical trial has a protocol or study plan that describes what will be done during the clinical trial, how the clinical trial will be conducted, and why each part of the clinical trial is necessary. The protocol of this study includes the clinical phases and preclinical experimentation of clinical trials.

Keywords: Clinical trials, Pre-clinical study, Principles and Phases of clinical trials.

6RsAICTE-EA-009

Repurposing of Approved drugs against SARS-CoV-2 through Molecular Docking Tools

Rohit Bhatia*^{1,2}, Raj Kumar Narang¹, Ravindra Kumar Rawal³

¹Department of Pharmaceutical Chemistry, ISF College of Pharmacy, Ferozepur G.T. Road, Moga-142 001, Punjab, India

²Research Scholar, Department of Pharmaceutical Sciences & Technology, MRSPTU, Bathinda-151001, Punjab, India

³Department of Chemistry, Maharishi Markandeshwar (Deemed to be University), Mullana-133207, Haryana, India

Abstract

In the present hour, the COVID-19 pandemic needs no introduction. There is a continuous and keen research is in progress in order to discover or develop a suitable therapeutic candidate/vaccine against the

fatal severe acute respiratory syndrome causing corona virus (SARS-CoV-2). Drug repurposing is an approach of

12

utilizing the therapeutic potentials of previously approved drugs against some new target or pharmacological response. In the presented work we have evaluated the RNA dependent RNA polymerase (RdRp) inhibitory potentials of FDA approved anti-viral drugs Remdesivir, Ribavirin, Sofosbuvir and Galidesivir through molecular docking. The studies were carried out using MOE 2019.0102 software against RdRp (PDB ID:7BTF, released on 8th April, 2020). All the four drugs displayed good docking scores and significant binding interactions with the amino acids of the receptor. The docking protocol was validated by redocking of the ligands and the root mean square deviation (RMSD) value was found to be less than 2. The 2D and 3D binding patterns of the drugs were studied and evaluated with the help of poses. The drugs displayed excellent hydrogen bonding interactions within the cavity of receptor and displayed comparable docking scores. These drugs may serve as new therapeutic candidates or leads against SARS-CoV-2.

Keywords: FDA, 3D binding, SARS-CoV-2, RdRp

6RsAICTE-EA-010

Current scenario an alternative animal testing

ShiviSondhi*, Navdeep Singh, Vinay Pandit, Shammy Jindal

Department of Pharmaceutics,

Laureate Institute of Pharmacy, Kathog, Distt Kangra, Himachal Pradesh-176031

Email id: shivi96sondhi@gmail.com

Abstract

The concept of alternatives animal techniques. The three 'R' represents and defined as the refinement, replacement and reduction these different method provide drug and chemical testing. Animal used to develop medical treatments, determine toxicity, safety of medications. Animal testing obtained to how disease developed in body. Number of animal used in research study has increased with development and advancement of research in medical technology. The pain, distress and death during scientific experiments. Ethical committed provide permission animal testing. An application of these approaches minimum use of animals in scientific experiments. Current situation animal testing that helps the development of important drugs and treatments which turn valuable human lives. Valuable knowledge can

be obtained through animal experiments. Various alternatives use of animal have suggested such as in vitro models, cell cultures, computer models and analyzing techniques.

Keywords: techniques, replacement, experiments and approaches.

6RsAICTE-EA-011

Alternatives to animal testing

Kiran Saini

Abstract:

The quantity of animals utilized in tests has ascended for innovative work in scientific innovation everywhere throughout the world. Despite the fact that it is advantageous to utilize substitutes in tries different things with live animals in new techniques and their utilization ought to be constrained for human, animal, and natural prosperity. The torment pain, enduring and death are educated by the animals during tests. The animal testing for research purposes should be conveyed while there is no other option. There are many organizations that provide guidelines for utilization of animal testing are ICH, CPCSEA, NIH and OECD. Options in contrast to animal testing were wanted to vanquish the disadvantages associated with animals explores and avoid the improper preliminaries. The rule of 3 Rs; decrease, refinement and replacement is administered for of trial utilization of animals for testing. This 3Rs methodology offers substitute for the medication and compound testing in animals. The favored techniques ought to use the base number of animals that bear the cost of sensible results and incline toward that assortment of animals with less ability to encounter distress, pain, and injury. The other strategies utilized are In vitro test strategies, tissue cultures methods, In-silico (Computer Modeling) procedures, Non-invasive imaging methods, for example, MRIs and CT Scans, micro fluidic chips. Numerous favorable advantages are associated with options are time, adequacy, less number of people, and cost viability.

Keywords: Innovation, Computer modeling, Adequacy, Preliminaries and guidelines

6RsAICTE-EA-012

In silico Studies of Astragalin from Tronchuda Cabbage against SARS CoV-2 Main Protease

Megha Gupta¹, Sandra Jose², Dr.G.N. Nirmala*

¹*Vels University, Chennai²Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology

Abstract

July
13 & 14
2020

AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”- ABSTRACT BOOK

tool that helps to identify molecules with potential inhibitory action against a specific target protein. Antiviral drugs such as Chloroquine and Favipiravir are being used in emergency cases; however, they are not appropriate for patients with a medical history of diabetes and cardiac vascular diseases. The deficiency

14

of availability of approved treatment for this pandemic demands the scientific community to find novel compounds with the potential to treat it. In this study, 15 phenolic compounds from Tronchuda Cabbage were docked with octameric SARS CoV-2 main protease (M(Pro)), PDB-3IWM for their anti-microbial activity using Autodock Vina with Chloroquine as the control. This work evaluates the compound through toxicity prediction and ADME prediction. Astragalin was docked successfully in the binding pocket of SARS-CoV-2 M(Pro). Computational approaches also predicts this molecule to have good solubility, pharmacodynamics property and obeys Lipinski’s rule, which makes it a favorable compound to pursue further in vitro and in vivo cell based assays to explore its potential for use against COVID-19.

Keywords: Molecular docking, SARS CoV-2 Main Protease, Plant Bioinformatics, Astragalin, Toxicity Prediction, phenolic compounds, Antiviral drugs.

6RsAICTE-EA-013

COVID-19 Looking beyond today and tomorrow towards new normal

Mihir otia, L.J. Institute of Pharmacy, Ahemdabad

Abstract

Just 6 months ago, the novel coronavirus now known as severe acute respiratory syndrome coronavirus 2 (SARSCoV-2) and COVID-19, the severe disease it causes, were unheard of. Today, this highly contagious and dangerous virus and the widespread virulent disease it causes have resulted in major disruptions of business, education, and transportation, and have permeated and interrupted virtually every aspect of daily life. Millions of people have been affected by COVID-19, hundreds of thousands have experienced critical illness, and tens of thousands have died. Physicians, other health care professionals, and health care systems around the world have been challenged like never before in recent history.

July
13 & 14
2020

*AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”-
ABSTRACT BOOK*

Keywords:coronavirus,Millions and professionals.

15

6RsAICTE-EA-014

An alternative to animal testing’s : replacement, reduction, refinement,rehabilitation,reuse,and recreation (6 rs) strategies to address current scenario”

Neha Sharma*, Tarun Sharma , Dr Vinay Pandit , Dr. M.S. Ashawat

Laureate Institute of Pharmacy Kathog Distt. Kangra HP

E.Mail-imnehavk@gmail.com

Abstract

The number of animals used in research has increased with the advancement of research and drug development in medical technology. Every year, millions of experimental animals are used all over the world. The pain, distress and death experienced by the animals during scientific experiments have been a debating issue for a long time. Besides the major concern of ethics, there are few more disadvantages of animal experimentation like requirement of skilled manpower, time consuming protocols and high cost. Various alternatives to animal testing were proposed to overcome the drawbacks associated with animal experiments and avoid the unethical procedures. A strategy of 6 Rs (i.e. replacement, reduction, refinement, rehabilitation, reuse, and recreation) is being applied for laboratory use of animals. Different methods and alternative organisms are applied to implement this strategy. These methods provide an alternative means for the drug and chemical testing, up to some levels.

Keywords:millions, development, Various,consuming and laboratory.

6RsAICTE-EA-015

Multi-component analysis of Lamivudine & Tenofovir in bulk drug by UV-Visible Spectrophotometer

Shweta Sharma, Pooja Kaushal, Amar Deep Ankalgi, M.S Ashawat

July
13 & 14
2020

*AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”-
ABSTRACT BOOK*

Abstract

A simple, accurate, specific and precise UV Spectrophotometric method for multicomponent analysis of Lamivudine and Tenofovir in bulk drug form has been developed. This method based on development of

16

Q- absorbance was measured at 263nm (isoabsorptive point) using methanol as a solvent. Beer’s range was 1-30µg/ml of Lamivudine and Tenofovir respectively. This method was validated using parameters linearity, precise, accuracy, limit of detection (LOD), limit of quantitation (LOQ) according to ICH guidelines. The recovery study gives satisfactory results that none of additives and interferes in method.

Keywords: Lamivudine, Tenofovir, Q- absorption method, validation.

6RsAICTE-EA-016

Nanoparticle in Cancer : ANobel Concept

Shivam Malhotra*, Archana Chaudhary, Tarun Sharma, Vinay Pandit

Laureate institute of pharmacy KathogJawalamukhi

Email:shivam9082@gmail.com

Abstract

In the United States, the estimated number of new cancer cases in 2018 will be approx. 1.7 million. Historically, combination chemotherapy has been the primary choice of treatment. However, chemotherapeutics have pharmaceutical limitations, among which include problems with stability and aqueous solubility. Likewise, dose limiting toxicity is significant with nonspecific toxicity to healthy cells, hair loss, loss of appetite, peripheral neuropathy and diarrhea being typical side effects. The emergence of Multidrug resistance (MDR) also presents s a significant challenge for the successful treatment of cancer whereby cancer cells become cross resistant to many of the chemotherapeutic agents used. Nanotechnology presents a new frontier for cancer treatment. It holds potential in minimizing systemic toxicity through the development of functionalized particles for targeted treatment. They also provide an alternative strategy to circumvent multidrug resistance as they have a capacity to by-pass the drug efflux mechanism associated with this phenotype. Aside from the advantages they offer in treatment,

nanoparticles are also emerging to be valuable diagnostic entities. This article highlights the various ways nanotechnology is being used to improve the treatment and management of cancer. We also discuss the opportunities and obstacles in this area and provide an up to date review of progress in the treatment of

July
13& 14
2020

AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”- ABSTRACT BOOK

cancer.

Keywords: Nanoparticle, chemotherapy, NDDS.

17

6RsAICTE-EA-017

Gallic acid: a polyphenol against tumor management

C.L.Baid , V.Sandhiya, MethaCollege of Pharmacy, Thoraipakkam,Chennai-97

Abstract

Cancer is the main leading cause of death worldwide and chemotherapy is mainly used to treat cancer. However, the severe side effects of the drugs lead the researchers to search for an alternative. Gallic acid, being polyphenols, has been reported for its anti-proliferative and apoptosis activity against many cancer cell lines. Moreover, its cyto-protective activity and strong anti-oxidant activity made Gallic acid a potential compound in cancer therapy. Since the incident of cancer was more in India, compared to other states, Tamil Nadu holding the second position in the development of colon cancer and breast cancers, and it was expected to reach 1.7 million by 2025 as per the statistics. The present review examines the anticancer property of gallic acid against cancers, also predicted the possible mechanism of the activity to be Apoptosis, yet a detailed study is needed to find out the molecular targets. In future, if this polyphenol has formulated in novel carrier form it would be a most promising moiety to enhance the cancer treatment to the upper stage

KEYWORDS: Anticancer, Gallic Acid

6RsAICTE-EA-018

Eudragit based oral polymeric nanoparticles for the improvement of bioavailability and antioxidant activity of resveratrol

Rahul Hasija^{a,b}, Sundeep Chaurasia^a, Swati Gupta^{b*}

Abstract

July
13 & 14
2020

*AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”-
ABSTRACT BOOK*

To improve the bioavailability and antioxidant potential of resveratrol (Res) by developing a drug-loaded polymeric nano-delivery system. Res-loaded polymeric nanoparticle (Res-PNPs) system was developed by

18

solvent extraction and diffusion method, and physicochemically characterized. In vivo pharmacokinetic and antioxidant potential of the Res-PNPs was investigated. The Res-PNPs had an optimum mean particle size ($410 \pm 9.78 \text{ nm}$), polydispersity index (0.203 ± 0.079) with percent entrapment efficiency (66.88 ± 5.45). The optimized Res-PNPs demonstrated significantly higher bioavailability (~ 4.07 -fold; $p < 0.05$) as compared to Pure Res. Furthermore, The nanoparticles containing Res were evaluated for their ability to scavenge the radical (2,2-azinobis (3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt) (ABTS^+). The profile obtained from the polymeric nanoparticles containing Res demonstrated that after 24 h, there was almost no increase in antioxidant activity, which was lower than that of the Pure Res. The radical-scavenging activity of Res-PNPs was shown to increase with time, and after 72 h, it was similar to that observed with Pure Res. Furthermore, IC_{50} of the optimized Res-PNPs were decreased with time. Thus, results of this study prove the suitability of using polymeric material to develop sustained release Res-PNPs formulations that can tailor in vivo behavior of the Res and enhance antioxidant effectiveness with time.

Keywords: Resveratrol, eudragit E100, polymeric nanoparticles, bioavailability, antioxidant activity

6RsAICTE-EA-019

Physiologically-Based biokinetic model A Conceptual substitute to Animal testing in pre-clinical study

Abstract

The use of animals is unconditionally increasing day by day for pre-clinical trials ,drug evaluation and research purpose before continuing the drug to clinical trials on human beings .Many government authorities has limited or banned the use of animals for various experiments as to reduce the harm to the animals . So PBBK(Physiologically-Based Bio kinetic Model)is a one of the best alternative to the replace or reduce animals used in some trials. It works on the different algorithm commands and the data given to the model in insilico studies and also shows the response in algorithm. This model is considered used to identify the ADME(Absorption Disintegration Metabolism Excretion) properties , Acute Toxicity

July
13& 14
2020

AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”- ABSTRACT BOOK

and

19

Pharmacokinetics of a drug in animals and humans without using them . For performing a model some necessary data is required. Responses are with the help of previous readings and data and the output responses are according to them . There are many PBBK software's present today and used widely in industries i.e. drug discovery as well as in academic.

Keywords:insilico , unconditionally, Disintegration, Toxicity and Physiologically.

6RsAICTE-EA-020

An alternative to animal testing: 6Rs strategies

ShavinderKumari* (Assistant professor Department of Pharmacology)

Department of pharmacology, Laureate institute of Pharmacy, Kathog,H.P

Email Id: shavinderkumari.doad@gmail.com

Abstract:

Animal models are used to test possibilities that would be difficult or impossible to test using the target species (humans). It is mandatory to do extensive toxicological studies in animals before the candidate drug gets approval for clinical trials in human. Research to conduct screening for drugs bioassay and for preclinical testing of new drugs. The pain, distress and death experienced by the animals during scientific experiments have been a debating issue various alternatives to animal testing were proposed to overcome the drawbacks associated with animal experiments and avoid the unethical procedures. A strategy of 3 Rs (i.e. reduction, refinement and replacement) is being applied for laboratory use of animals. These methods provide an alternative means for the drug and chemical testing, up to some levels.

For a long time, the discussion about animal testing vs its alternatives centered on animal welfare. Technical advances have changed the frontline somewhat, with in vitro and in silico methods gaining more ground alternative approaches" are increasingly replacing animal models as predictive tools and it

July
13 & 14
2020

*AICTE Sponsored Two Days National e-conference on "An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario"-
ABSTRACT BOOK*

needs to be demonstrated that these novel methods are fit for purpose. Alternative approaches include in vitro test methods, non-testing approaches such as predictive computer models up to entire testing and assessment strategies composed of method suites, data sources and decision-aiding tools.

Keywords: toxicological studies, alternatives, possibilities and Research.

20

6RsAICTE-EA-021

An alternatives to animal testing's : replacement, reduction, refinement, rehabilitation, reuse and recreation (6rs) strategies to address current scenario

Shivani Sharma*, Amar Deep Ankalgi, Mahendra Singh Ashawat, Vinay Pandit

Laureate Institute of Pharmacy Kathog Distt. Kangra, HP

Email: shivangi2288@gmail.com

Abstract

The animal testing had been in implementation from the last many decades. The number of animals used in research has enlarged with the improvement of research and development in medical technology. Every year, millions of experimental animals are used all over the world. Today in every new drug discovery numerous monkeys, dogs, rats, and other animals are burned, blinded, cut open, poisoned, starved, and drugged behind closed laboratory doors. The existence of methods like in vitro pyrogen test, embryonic stem cell test, carcinogenicity test, has paved the good pathway for the usage of alternatives to animal

experimentation. Alternatives to animals experiments can only be put into practice by the general awareness of the public about the animal welfare, the tediousness of the animal methods, and the extortionate and painstaking nature of these methods. There is general agreement that the best animal welfare results in the best science, that regulatory requirements based on an understanding of mechanisms and early relevant biomarkers result in sophisticated and logical science. Thus, alternatives methods enabling replacement, reduction, refinement, rehabilitation, reuse, and recreation (6Rs) are in reality often more scientifically advanced and valid methods. An integrated application of these approaches would give an insight into minimum use of animals in scientific experiments.

Keywords:Pyrogen, awareness, implementation and tediousness.

July
13 & 14
2020

AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”- ABSTRACT BOOK

21

6RsAICTE-EA-022

Pharmacist is the lifeline as mankind to the COVID-19

Simran

Laureate Institute of Pharmacy, Kathog, Distt. Kangra, Himachal Pradesh-176031

Abstract

The COVID-19 epidemic has affected every area of life. The greatest challenges has been adapt the functioning of the health service to prevent the spread of the epidemic and to help infected patients. This has required the involvement of not only doctors, nurses but also pharmacist. In the pandemic, government in many countries have granted pharmacists greater authority.. Millions of people have been affected by COVID-19, hundreds of thousands have experienced critical illness, and tens of thousands have died. Physicians, other health care professionals, and health care systems around the world have been challenged like never before in recent history.

Keywords:Pharmacists, COVID-19 and professionals.

6RsAICTE-EA-023

Impact of Immune Boosters in COVID-19

Mr.Yogendrakumar *1, Shiv Singh 1, 2 Shri Ramnath Singh Institute of Pharmacy and Technology ,
ShitholiGwalior (MP)

Email :- drxyogendrasharma@gmail.com.

Abstract

The immune system is our most pivotal ally, and its main Function is to keep us healthy and robust. If we eat foods which are completely pure and full of vitamins, enzymes And minerals, our immune system will be able to continue its battle against viruses, harmful bacteria, parasites and Toxins. The idea of boosting your immunity is enticing, But the ability to do so has proved elusive for several

July
13& 14
2020

*AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”-
ABSTRACT BOOK*

reasons. The immune system is precisely that a system, Not a single entity. To function well, it requires balance and harmony. There is still much that researchers don’t Know about the intricacies and interconnectedness of the Immune response. Nature has blessed mankind with abundant medicinal herbs which provide timely and adequate Remedies to several health disorders. The medicinal herbs Enable the people to boost their immunity in times of Health crisis like novel coronavirus.

22

The people are required to know the new concepts of quarantine and self Isolation while trying to make use of medicinal herbs Which boost immunities. It is necessary to understand the Correlation among medicinal herbs, immune system and COVID-19 in the present times. In the wake of the COVID-19 outbreak, the development, maintenance and Optional functioning of immune cells are dependent on
Keywords:- Immune system , Covid -19 , Quarantine , health , boosters .

6RsAICTE-EA-024

An Alternative to animal testing-Replacement, Reduction, Refinement, Rehabilitation, Reuse, Recreation.

Subash S, Senghundhar college of pharmacy.

Abstract

Alternatives to animal testing are the development and implementation of test methods that avoid the use of live animals used in research has increased with advancement of research and development in medical and biotechnology. Every year, millions of experimental animals are used all over the world. The pain, distress, death experienced by the animals .During scientific experiments have been a debating issue for a long time. Besides the major concern of ethics, there are few more advantages of animal experimentation like requirement of skilled manpower, time consuming protocol and high cost. Various alternatives to animal testing were proposed to overcome the drawbacks associated with animal experiments and avoid unethical procedures. A strategy of 6Rs (i.e., replacement, reduction, refinement, rehabilitation, reuse, recreation) is being applied for laboratory animals. Different methods and alternative organisms are applied to

implement this strategy. These methods provide an alternative means for the drugs and the chemical testing, up to some levels. An integrated application of these approaches would give an insight into minimum use of animals in scientific experiments. My research reflects to overcome integrated methods to testing drugs instead of using animal.

July
13 & 14
2020

AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”- ABSTRACT BOOK

Keywords: Alternative organism, model organism, 6Rs, laboratory animal, animal ethics, defining, developing, validating, accepting.

23

6RsAICTE-EA-025

How to Reduce the Animal Testing: A Review

Aanchal* , Ajay Kumar, Bhumika Thakur D Pharm 1st Year,
Laureate Institute of Pharmacy Kathog H.P.

Abstract

An estimated 26 million animals are used every year for scientific and commercial testing. Animals are used to develop medical treatments, determine the toxicity of medications, check the safety of products destined for human use, and other biomedical, commercial, and health care uses. Research on living animals has been practiced since Ancient times. Researchers will use animal testing to obtain clues to how the disease develops in the body. The pain, distress and death experienced pre experimentation like

requirement of skilled manpower, time consuming protocols and high cost.

Keywords:Animals, treatments and Ancient times

6RsAICTE-EA-026

Role of pharmacist in COVID-19 Public awareness programs

Shri. Ramnath Singh Institute of Pharmaceutical Science and Technology, Sitholi, Gwalior

Mr. Ankur Agrawal Assistant Professor

Email-id: ankur14agrawal@gmail.com

Abstract

COVID-19 is the infectious disease caused by the most recently discovered corona virus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhoea. These symptoms are usually mild and begin gradually. Some people become infected but don't develop any symptoms and don't feel unwell. Most people (about 80%) recover from the disease without needing special treatment. Around 1 out of every 6

**July
13& 14
2020**

*AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”-
ABSTRACT BOOK*

people who gets COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure, heart problems or diabetes, are more likely to develop serious illness. People with fever, cough and difficulty breathing should seek medical attention.

Keywords:diarrhoea., COVID-19, tiredness.

24

6RsAICTE-EA-027

An alternatives to animal testing’s : replacement, reduction, refinement,rehabilitation, reuse and recreation (6rs) strategies to address current scenario

Dheeraj Singh*, Dr. Amar Deep Ankalgi

Department of Pharmaceutical Analysis & Quality Assurance, Laureate Institute of Pharmacy

KathogJwalaji 176031, India

Abstract

The animal testing had been in implementation from the last many decades. The number of animals used

in research has enlarged with the improvement of research and development in medical technology. Every year, millions of experimental animals are used all over the world. Today in every new drug discovery numerous monkeys, dogs, rats, and other animals are burned, blinded, cut open, poisoned, starved, and drugged behind closed laboratory doors. The existence of methods like in vitro pyrogen test, embryonic stem cell test, carcinogenicity test, has paved the good pathway for the usage of alternatives to animal experimentation. Alternatives to animal experiments can only be put into practice by the general awareness of the public about the animal welfare, the tediousness of the animal methods, and the extortionate and painstaking nature of these methods. There is general agreement that the best animal welfare results in the best science, that regulatory requirements based on an understanding of mechanisms and early relevant biomarkers result in sophisticated and logical science. Thus, alternatives methods enabling replacement, reduction, refinement, rehabilitation, reuse, and recreation (6Rs) are in reality often more scientifically advanced and valid methods. An integrated application of these approaches would give an insight into minimum use of animals in scientific experiments.

Keywords: requirements, technology, Pyrogen, alternatives and mechanisms

July
13& 14
2020

AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”- ABSTRACT BOOK

25

6RsAICTE-EA-028

Igh time to go for non animal testing approach

Ankush Agarwal ^{a*}, Ankita Sharma, KumudKant Awasthi, AnajaliAwasthi
Department of Zoology, University of Rajasthan, Jaipur, 302004, India Department of Zoology,
Vivekanand Global University, Jaipur, 302017, India

Abstract

95% of drugs fail in humans even after passing animal trials. Drugs that could not pass animal testing may have the possibilities to cure humans. Animal testing cause distress or suffering to animal. Unethical use of animal models and cruelty towards them leads to a concerning issue. Human toxicity signs could not be

identified through animal testing. PETA provides funds to develop non animal testing approach for conducting experiments and opposes the use and abuse of animals in anyway. “In silico tools have a bright future in toxicology. They add the objectivity and the tools to appraise our toolbox. They help to combine various approaches in more intelligent ways than a battery of tests”.

Keywords:PETA, possibilities and Unethical

6RsAICTE-EA-029

6R: AN ETHICAL WAY TO ANIMAL TESTING

Ankita Sharma ^{*,} Ankush Agarwal, KumudKant Awasthi, AnajaliAwasthi
Department of Zoology, University of Rajasthan, Jaipur, 302004, India Department of Zoology,
Vivekanand Global University, Jaipur, 302017, India

Abstract

Committee for the Purpose of Control And Supervision of Experiments on Animals(CPCSEA) Established under the Prevention of Cruelty toAnimals Act 1960 in India. CPCSEA ensures no animal model suffer from distress or pain during experimentation. •Institutional Animal Ethics Committee’ nominee assigned by CPCSEA. Provide guidelines for animal experimentation and approves animal house facilities after proper inspection. Take action against individual violating any legal norm of CPCSEA.The 4R: Adopted by CPCSEAResearchers’ attitudes to the 3Rs

**July
13& 14
2020**

*AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”-
ABSTRACT BOOK*

This 6R concept enabled us to maintain biodiversity in nature to some extent. If every Researcher follow the guidelines of CPCSEA properly and ethically then model organisms will undergo minimum discomfort. Unnecessary dissecting and killing of animals leads to the extinction of species which is a concerning issue.

26

Recent studies suggests that alternative techniques which are used in place of animal experimentation are going to be leading strategies in research areas.

Keywords:CPCSEA, experimentation and violating.

6RsAICTE-EA-030

Alternatives to Animal Experimentation

Abstract

Today in every new drug discovery countless monkeys, dogs, rats and other animals are burned, blinded, cut open, poisoned, starved and drugged behind closed laboratory doors. In most of drug study we obtained inaccurate result because of vast physiological variation of animal and human. Animal studies teach us nothing about the health of humans because human reactions to illness and medications are completely different from the reactions of other animals. different animal absorbs, metabolize and excrete substances differently than human do. After all of this we continuously used animals for experimentation at research centers and collages. so, why we can use animals.. In silico computer stimulation also used data from prior animal experiments and in vitro cell culture also used animal derived products. all of the above information says that according to my opinion the animal and non-animal experiment can't give satisfactory result. By doing experiment on human individual or its product we can only obtained accurate result.

Keywords: individual, research and metabolize

6RsAICTE-EA-031

An Alternatives to Animal Testing's"

Sumit Kumar*, Dev Raj, Vinay Pandit

Laureate Institute of Pharmacy, Kathog, Jawalamukhi, Distt. Kangra(H.P)

July
13& 14
2020

*AICTE Sponsored Two Days National e-conference on "An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario"-
ABSTRACT BOOK*

Abstract

The number of animals used in research has increased with the advancement of research and development in medical technology. Various animals like mice, rats, hamsters, rabbits, fishes (examples- zebra fish,

27

trout), birds (mainly chicken), guinea pigs, amphibians (xenopus frogs), dogs, cats etc. are being used in research for long time. Drug testing and toxicological screenings which are useful in development of new treatments for infectious and non-infectious diseases is the main purpose of such studies. Every year, millions of experimental animals are used all over the world. The pain, distress and death experienced by the animals are the main problem arises during the scientific experiments. So in order to overcome these

problems various acts and laws have been passed to bring the control over unethical use of animals and minimize the pain to animals during experimentation. For example, in 1824, the organization for animal rights was formed by the Royal Society for the Prevention of Cruelty to Animals. In 1876, an act for prevention of cruelty to animal was formed in UK (Balls, 1994). It came into existence in India, France and USA in the year 1960, 1963 and 1966, respectively. At present, many rules and acts are followed at international level, to protect the animals against the cruelty and misuse. The organizations like ICH (International Conference on Harmonization of technical requirements for registration of pharmaceuticals for human use), CPCSEA (Committee for Purpose of Control and Supervision on Experiments on Animal), NIH (National Institute of Health), OECD (Organization for Economic Co-operation and Development) provides the guidelines for animal house keeping, breeding, feeding, transportation, and mainly for their use in scientific experiments.

Keywords: development, organizations and ICH.

6RsAICTE-EA-032

Saving the Animals: They have Emotion Too.

1. Shreya Kumar, BCDA College Of Pharmacy & Technology, 78, Jessore Road(S), Hridaypur, Kolkata - 700127

2. Arunava Chandra Chandra, Department of Pharmaceutical Chemistry, School of Pharmacy, Techno India University, Salt Lake City, Sector-V, EM-4, Kolkata-700091, West Bengal, India. Email-Id: arunava.eid@gmail.com

Abstract:

The use of animals to better understand human anatomy and human disease is a centuries-old practice. Every year, millions of experimental animals are used all over the world. The pain, distress and death

**July
13 & 14
2020**

*AICTE Sponsored Two Days National e-conference on “An Alternatives to Animal Testing’s: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario”-
ABSTRACT BOOK*

experienced by the animals during scientific experiments have been a debating issue for a long time. Besides the major concern of ethics, there are few more disadvantages of animal experimentation like requirement of skilled

28

manpower, time consuming protocols and high cost. Various alternatives to animal testing were proposed to overcome the drawbacks associated with animal experiments and avoid the unethical procedures. A

strategy of 6 Rs (i.e. Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation) is being applied for laboratory use of animals. Different methods and alternative organisms are applied to implement this strategy. The scientists should be sure that the information obtainable with the experiments is not yet available or that the protocol was designed taking into account animal protection considerations. The chosen methods must use the least number of animals; provide satisfactory results; use the species with the least ability to experience pain, suffering, anguish, and damage; and be optimal for the extrapolation of results to the target species such as humans. These methods provide an alternative means for the drug and chemical testing, up to some levels. A revolution in thinking and practice is needed, involving an escape from relying on animal tests, and resulting in a strong and convincing focus on new ('alternative') methodology based on modern and advanced cell and molecular biology, to provide data of direct relevance to humans in real-world human situations, in relation to the diseases to be tested and the therapies, including new drugs, which could prevent, relieve or cure them.

Keywords: Alternative organism, Model organism, 3 Rs, Laboratory animal, chemical testing, Methodology, Animal ethics.

6RsAICTE-EA-033

ANIMAL RESEARCH AGAINST COVID-19: AN OVERVIEW.

Arvind Singh Jadon and Poonam Bhadauriya

Gurukul Institute of Pharmaceutical Science and Research, Gwalior-474001, Madhya Pradesh

Abstract

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Coronaviruses also affect animals and they are zoonotic, meaning they can be transmitted between animals and people. In the rush to find vaccines and treatments, researchers have started working on the virus.

July
13 & 14
2020

*AICTE Sponsored Two Days National e-conference on "An Alternatives to Animal Testing's: Replacement, Reduction, Refinement, Rehabilitation, Reuse and Recreation(6Rs) Strategies to Address Current Scenario"-
ABSTRACT BOOK*

Here is a list of the ongoing research involving animals

Genetically engineered lab mice to boost COVID-19 vaccine and research: Experts studies have shown that

the 2019 novel coronavirus attaches to a protein called angiotensin-converting enzyme 2 (ACE2) in the respiratory tract of patients. While laboratory tests attempt to replicate this in mice, a problem arises because the genetic makeup of the animal's ACE2 is different from humans. This turns into a roadblock for researchers hoping to develop a treatment or vaccine for COVID-19. It is important to thoroughly determine its safety before a drug can be approved for human trials, which is why a mouse model was developed to speed up the process.

Keywords:ACE2, Coronaviruses and angiotensin.

6RsAICTE-EA-034

Phonophoresis Drug Delivery System

Mahajan Tejasvi, Jindal Shammi, Pandit Vinay, M.S Ashwat

Laureate Institute of Pharmacy, Kathog, Jawalaji, H.P

Email id: tejasvimahajan98@gmail.com

Abstract

Phonophoresis is a form of treatment that is used during physical therapy. It involves the use of ultrasound combined with a medication gel. The medication is applied to the skin, and then ultrasound waves are used to help pass the medicine through the skin and into your injured body part. Phonophoresis has been successfully to deliver anti-inflammatory medication to inflamed subcutaneous. Phonophoresis is a form of treatment that is used during physical therapy. Phonophoresis is used most often in the treatment of inflammation in a muscle, tendon, ligament or other soft tissue in the body. Therefore, phonophoresis is considered an anti-inflammatory treatment. Phonophoresis, a technique in which ultrasound is used to increase the transcutaneous transmission of drugs, is a widely applied clinical technique for the treatment of musculoskeletal inflammation. Inflammation is the natural healing process that occurs in the body after injury. The signs and symptoms associated with inflammation include pain, swelling, redness and increased temperature of the inflamed body part. Anti-inflammatory medications are delivered using phonophoresis. This is a noninvasive method of delivering appropriate medications. Phonophoresis requires an ultrasound machine. A pulsed method is typically used over continuous delivery. This method, like iontophoresis, is typically used to treat musculoskeletal conditions such as asbursitis and tendonitis. Physical therapists with

special training can treat patients using this technique in order to administer the medication directly to the area of concern.

Keywords: Phonophoresis, anti-inflammatory, subcutaneous, Physical therapy, transcutaneous, musculoskeletal, iontophoresis, bursitis, tendonitis.

6RsAICTE-EA-035

An alternatives to animal testing’s : replacement, reduction, refinement,rehabilitation, reuse and recreation (6rs) strategies to address current scenario.

Sonam* DR. Vinay pandit Archana Choudhary, Laureate Institute of Pharmacy, Kathog-HP

Abstract

Replacing animal tests does not mean putting human patients at risk. It also does not mean halting medical progress. Instead, replacing animal testing will improve the quality as well as the humaneness of our science. Thankfully, the development of alternative methods is growing. Due to innovations in science, animal tests are being replaced in areas such as toxicity testing, neuroscience and drug development. But much more needs to be done.

Keywords: Replacing, development and terminologies.

6RsAICTE-EA-036

An alternatives to animal testing’s : replacement, reduction, refinement,rehabilitation, reuse and recreation (6rs)

Tanvi Gutam Laureate Institute of Kathog-Jawalamukhi (H.P)

Abstract

The animal testing had been in implementation from the last many decades. The number of animals used in research has enlarged with the improvement of research and development in medical researches. Every year, millions of experimental animals are used all over the world. Today in every new drug discovery numerous monkeys, dogs, rats, and other animals are burned, blinded, cut open, poisoned, starved, and drugged behind closed laboratory doors. The existence of methods like in vitro pyrogen test, embryonic stem cell test, carcinogenicity test, has paved the good pathway for the usage of alternatives to animal experimentation.

Keywords: discovery, experimentation and Pyrogen.

6RsAICTE-EA-037

Physiological based biokinetic a conceptual substitute to animal testing in pre-clinical studies

^{1*}Virmani Mayank,^{2*}Gupta Shreya,^{3*}SoodRatima

Department of Pharmacy Practice, I.S.F. College Of Pharmacy ,Moga ,India

Abstract

The use of animals is unconditionally increasing day by day for pre-clinical trials ,drug evaluation and research purpose before continuing the drug to clinical trials on human beings .Many government authorities has limited or banned the use of animals for various experiments as to reduce the harm to the animals . So PBBK(Physiologically-Based Bio kinetic Model)is a one of the best alternative to the replace or reduce animals used in some trials. It works on the different algorithm commands and the data given to the model in insilica studies and also shows the response in algorithm. This model is considered used to identify the ADME(Absorption Disintegration Metabolism Excretion) properties , Acute Toxicity And Pharmacokinetics of a drug in animals and humans without using them . For performing a model some necessary data is required. Responses are with the help of previous readings and data and the output responses are according to them . There are many PBBK software's present today and used widely in industries i.e. drug discovery as well as in academic.

Keywords: PBBK, insilica, drug, model and algorithm.

6RsAICTE-EA-038

Dark side of Animal testing and their potential alternatives.

Sheetal, Uttam Kumar MandalDepartment of Pharmaceutical Sciences and Technology,

Maharaja Ranjit Singh Punjab Technical University, Bathinda – 15001, Punjab

Email id: gargsheetal0018@gmail.com, mandalju2007@gmail.com

Abstract

Animalstestingistheutilizationofanimalsinexaminationtodecidethewellbeingofanitem, normally beautifying agents or pharmaceutical medications. This strategy for testing is an obsolete science while elective, non-animals techniques are quickly getting progressively successful. Laws in the United States don't require makeup or medications to be tried on animals,justthattheitemsmustbedemonstratedsafe

(FDA). Some contend that animal testing is important to improve human life. However, animals are harmed during the tests, despite the numerous laws put in place to avoid cruelty. Although many believe animal testing is necessary to ensure medicines and cosmetic products are safe, alternative, non-animal methods of testing, such as in vitro tests and EpiDerm, are available, and should be implemented. In research based sciences "Options to Animals" can be expressed as testing techniques which can supplant halfway or outright utilization of animals; and this field not just depend on the substitution of tests however the turn of events and usage of those testing strategies to keep away from the utilization of live animals additionally goes under this segment.

There are two major alternatives to in-vivo animal testing: The first ones are in vitro cell culture techniques, the second ones are In silico computer simulations. Micro dosing is one of the other alternative options to study the basic behavior of drugs by using lower than expected doses to produce whole body effects in volunteer human beings. Microfluidic chips are getting key interest in alternatives; because of the provision of more complex information as compare to other in vitro tests. Imaging studies like computed tomography (CT), magnetic resonance imaging (MRI), functional magnetic resonance imaging (fMRI), positron emission tomography (PET) and single photon emission computed tomography (SPECT) are playing an unmatched role while studying some organs systems of the body. Six Rs (6Rs) Replacement, Reduction, Refinement, Refinement, Reuse and Recreation are like guiding principles for more ethical use of animals in testing.

Keywords: Refinement, unmatched and utilization.

6Rs AICTE-EA-039

Multi-component analysis of Atovaquone and Mefloquine hydrochloride in bulk drug by UV-Visible Spectrophotometer

Sanyam Sharma*, Kanya Jindal, Amar Deep Ankalgi, M.S Ashawat Laureate Institute of Kathog-Jawalamukhi (H.P)

Email i.d. sanyamkhpi@gmail.com

Abstract

A simple, accurate, specific and precise UV Spectrophotometric method for multicomponent analysis of Atovaquone and Mefloquine hydrochloride in bulk drug form has been developed. This method based on

development of simultaneous estimation was measured at 251 and 222 using ethanol as a solvent. Beer's range were 2-12 μ g/ml of Atovaquone and Mefloquine hydrochloride respectively. This method was validated using parameters linearity, precise, accuracy, limit of detection (LOD), limit of quantitation (LOQ) according to ICH guidelines. The recovery study gives satisfactory results that none of additives and interfere in method.

Keywords: Atovaquone and Mefloquine hydrochloride , Simultaneous estimation method, validation.

6RsAICTE-EA-040

An alternatives to animal testing's : replacement, reduction, refinement, rehabilitation, reuse and recreation (6rs) strategies to address current scenario

Department of pharmacology Amity institute of pharmacy, Amity university, sector-125 Nodia. (U.P) Rohit Bharadwaj, Prof Dr. Satyendra Kumar Rajput

Abstract

The animal testing had been in implementation from the last many years. The number of animals used in research has enlarged with the improvement of research and development in medical technology. Now a day's various animals are used for the testing and research purpose for the medical terminologies that is not proper way to perform such research by harming animals and that does not mean testing and research are performed on the human beings. We have to find the new ways that can help full for animals and human also to carry out research and development of medical terminologies and science.

Keywords: improvement, performed.

6RsAICTE-EA-041

Sebacinavermitifera based bioformulation: an alternate to the sustainable phytopromotional production

Kamal Jeet^{1*}, Ashish Baldi^{2#} ¹Research Scholar, IKG Punjab Technical University, Jalandhar, Punjab-144603 ²MRS Punjab Technical University, Bathinda, Punjab-151001 *Presenting author; #Corresponding author,

Email: baldiashish@gmail.com

Abstract

Arbuscular mycorrhizal association is widely known and most ancient symbiotic association in the world, and has been found in 85% of higher plant. AM-like fungi *Sebacinavermitifera* an unique AM fungi; axenically cultivable and can be manipulate under in-vitro conditions. *S. vermifera* is belonging to the family *Sebacinaceae*; order *sebacinales*. Wide spectrum host association and multifaceted beneficial effects. For efficient delivery and application in rhizosphere require an inert carrier material having ease of handling and assist a long term storage quality. Solid, inert and inorganic material is a wise choice over any liquid materials.

The present study provides experimental insights in to the process to develop *Sebacinavermitifera* based bioformulation with optimized inorganic carrier material. Pot and field trials of developed bioformulation with *Trigonella foenumgraecum* provide scientific evidence of phytopromotional production.

The application of talcum based bioformulation containing *S. vermifera* is supported by shelf life study and the magnitude of growth promotions recorded under both pot and field trials. Therefore, study promotes the *S. vermifera* based bioformulation for sustainable phytopromotions.

Keywords: bioformulation, Arbuscular, optimized and sustainable

6RsAICTE-EA-042

Topical Glycyrrhetic Acid as a Potential and Innovative Therapeutic Approach for Atopic Dermatitis Using BALB/c Mice Model

Pravin Kumar¹, Dinesh Kumar Sharma², Mahendra Singh Ashawat¹

¹Laureate Institute of Pharmacy, Kathog, Jwalamukhi, H.P, India

²HIPR, Dehradun, Uttarakhand, India

Corresponding author:msaresearchg@gmail.com

Abstract

The aim of the present research was to evaluate the efficacy of topical cream of glycyrrhetic acid (GA)

35

and cream loaded with ethosomes of GA for the management of atopic dermatitis (AD). GA creams and creams loaded with ethosomes of GA were prepared by phase inversion method. The ethosomes of GA were prepared and evaluated for *in vitro* parameters i.e particle size distribution, entrapment efficiency, zeta potential and TEM analysis. The creams were investigated for parameters i.e pH, thermal stability, spreadibility, viscosity, acid value, saponification value, *ex vivo* permeation and skin retention. The optimized formulations GAC2 (2.0%w/w) and GAEC2 (2.0%w/w) of GA were studied *in vivo* on 2,4-Dinitrochloro benzene induced AD like skin lesions in BALB/c mice. The pH of the creams was near to acidic pH of skin. The cream loaded with ethosomes of GA showed higher skin retention. The topical formulations of GA significantly decreased the ear thickness, dorsal skin thickness and skin severity, WBC infiltrations, eosinophils and IgE antibodies in comparison to negative control group. The therapeutic efficacy of cream loaded with ethosomes of GA was significantly higher than conventional cream of GA. The topical creams of GA showed long term therapeutic potential for AD.

Keywords: Atopic Dermatitis, Glycyrrhetic acid, Creams, Ethosomes, BALB/c mice, Immunoglobulin E.

6RsAICTE-EA-043

Animal experimentation, welfare and scientific research

Dipankerkashive*, Dr. Vinay Pandit

Department of Pharmaceutics, Laureate Institute of Pharmacy, Kathog, H.P

Email- dipankerkashive9@gmail.com

Abstract

Hundreds of laboratory animals are being used every year for scientific experiments, mostly mice, rats, rabbits, guinea pigs etc. in additions to animals sacrificed to promote scientific research, millions of animals slain. Therefore, CPSCEA (Committee for the purpose of control and supervision of experiments on animals) is a statutory body formed under the prevention of cruelty to animal’s act 1960. The CPSCEA functions with a brilliant network of volunteers who liaise with laboratories. There are several guidelines enforced by CPSCEA for laboratory animal’s care. The CPSCEA has been deliberating on alternatives in

basic/ regulatory research and education. The CPSCEA proactively trains and guides scientific and non-scientific personnel on the issues of alternatives and lab animal’s welfare; and the CPSCEA have fought

legal issues on animal care and welfare that favored the alternatives also. Institutional Animal Ethics Committees are constituted in every laboratory, which are also empowered to approve research project proposals that use rats, mice, rabbits. Thus, it is necessary to follow the guidelines of CPSCEA for conducting scientific research on animals and to maintain the ethics.

Keywords: CPSCEA guidelines, animal care, animal testing, scientific research.

6RsAICTE-EA-044

In Vitro Models for SARS-CoV-2 research

Rinu Rana*, Mahendra Singh Ashawat

Laureate institute of Pharmacy, Kathog

E-mail id: rinupharma@gmail.com

Abstract

The World Health Organization (WHO) has declared COVID-19 as a pandemic. Various clinical trials are currently used for discovering treatment of disease. For this, models that can correctly represent the characters of the virus and treatment of COVID-19 are required. This article briefly describes multiple in vitro animal models. It includes description of air-liquid interface (ALI) culture of human primary airway epithelial cells, Infection models which closely represents the native cells it targets, stemcell technologies, high-density oligonucleotide array analysis and lung biofabrication. These are emerging tools for identifying new drug targets and drug discovery processes. These models overcome the chances of imperfect animal model and reduce the risk of clinical trial failures.

Keywords: Organization, COVID-19, oligonucleotide and

6RsAICTE-EA-045

Adarsh Kumar*, Rinu Rana Laureate Institute of Pharmacy, Kathog

Email: adarshdhiman14@gmail.com

Abstract

Now a day’s various animals are used for the testing and research purpose for the medical terminologies

that is not proper way to perform such research by harming animals and that does not mean testing and research are performed on the human beings. We have to find the newways that can help full for animals

37

and human also to carry out research and development of medical terminologies and science. However also a skilled worker is required to perform the animal testing. The strategy of 3Rs are used for the animal testing and these 3Rs are refinement, reduction ad replacement. New techniques are also introduced to reduce the animal testing and the two major techniques are in vitro cell culture and silico computer stimulation. These methods provide an alternative means for the drug and chemicals testing, up to some levels. A brief account of these alternatives and advantages associated are discussed in this article. An integrated application of these approaches would give an insight in to minimum use of animalsin scientificexperiments.

Keywords: 3Rs, in vitro cell culture, silico computer stimulation.

6RsAICTE-EA-046

Multicomponent analysis of emtricitabine and ritonavir by using RP-HPLC

Aman Kapoor*, Amardeep Ankalgi, Upasana Thakur, M.S. Ashawat.

Laureate Institute of Pharmacy Kathog, Jawalaji, Himachal Pradesh.

Emai-id:amankapoorpaqa@gmail.com

Abstract

Developing a single analytical method for estimation of individual drug from a multidrug composition is a very challenging task. A simple, rapid, precise, and reliable reverse phase HPLC method was developed for the separation and estimation of two drugs emtricitabine and ritonavir in bulk drug mix and pharmaceutical dosage forms. The estimation was carried out using C-18 column; mobile phase consisting of methanol : water ; the flow rate of 1.0 mL/min and ultraviolet detection at 251 nm. The drugs were properly resolved having run time of 3.2min and 7.7 min for Emtricitabine and ritonavir, respectively. The method was validated as a final verification of method development with respect to precision, linearity, accuracy, ruggedness, and robustness. The validated method was successfully applied to the commercially available pharmaceutical dosage form, yielding very good and reproducible result.

Keyword : HPLC, Emtricitabine, Ritonavir.

6RsAICTE-EA-047

Organ-on-a-chip: An Alternative for Animals Studies in Drug Discovery

Karan Wadhwa#, A C Rana Institute of Pharmaceutical Sciences, Kurukshetra University, Kurukshetra, Haryana email: karanwdhw1@gmail.com

Abstract

Animal assays are crucial for preclinical studies in the drug discovery process, but species differences and ethical considerations are obstacles in this. To overcome these issues, cell-based assays using human-derived cells have been designed but they are unable to predict organs interactions, drug efficacy and toxicity. Thus in order to develop more predictive tissue models using human cells to determine drug efficacy and safety in drug discovery, in vitro microfabricated devices such as organ-on-a-chip have been designed that mimic dynamic interactions of in vivo microenvironments. Organ-on-a-chip is a 3-D in vitro microfabricated device consists of a multichannel microfluidic cell culture that mimics the biomechanical and biochemical microenvironments of in vivo tissues and also predicts organ interactions. Various organs and tissues, such as the heart, kidney, liver, lung, kidney, and gut have been designed as in vitro microfabricated devices.

Keywords: Organ-on-a-chip, drug discovery, microfluidics, alternative to animal studies

D. Pharmacy, B. Pharmacy B. Pharmacy Practice, M. Pharmacy, Ph.D

D. Pharmacy, B. Pharmacy B. Pharmacy Practice, M. Pharmacy, Ph.D



Laureate Institutes of Pharmacy
(A Unit of laureate Educational Society Shimla Estt. 1992
V.P.O. Kathog, Tehsil Jwalamukhi,
Distt. Kangra, H.P. 176031

(Approved by PCI & AICTE, NEW Delhi and H.P. Govt)
Affiliated to H.P. Technical University, Hamirpur
& H.P. Takniki Shiksha Board
Recognized Under 2(f) of UGC Act 1956

Award

- Global Education Excellence Award - 2014
- Most Promising Institute of Pharmacy in Himachal Pradesh (2017) (Awarded by Chetan Bhagat)



AICTE-CII- Golden Category 2018

Admissions Open

Higher Technical course:

- D. Pharmacy (2 Year)
- B. Pharm (4-Year)
- B. Pharmacy Practice (2 Year)
- M. Pharm (Pharmaceutics, Pharmaceutical Analysis & QA) (2 Year)
- Ph.D (Pharmaceutical Sciences)



Laureate Institutes of Pharmacy



E-mail: contactlaureate@gmail.com,
Website : www.laureateinstitute.in
Contact : 09218428040, 09218405087,
09805676721, 7018933755

*Subjected to approval from state Govt.

D. Pharmacy, B. Pharmacy B. Pharmacy Practice, M. Pharmacy, Ph.D

D. Pharmacy, B. Pharmacy B. Pharmacy Practice, M. Pharmacy, Ph.D

LAUREATE GROUP OF INSTITUTIONS

(A Unit of Laureate Educational Society Shimla Estd: 1992, Experience of 28 year of education)



International Accreditation Organization



Global Education
Excellence Award - 2014



Laureate Institute of Pharmacy

**D. Pharmacy, B. Pharmacy, B. Pharmacy Practice,
M. Pharmacy (Pharmaceutics & Pharmaceutical
Analysis and Quality Assurance)& Ph.D**

Affiliated to H.P.T.U. - Hamirpur

Approved by PCI and AICTE, New Delhi

Contact laureate@gmail.com www.laureteintitute.in

Laureate Global School

Nursery to X

Affiliated to C.B.S.E. New Delhi

www.lauretegs.in, laureategs@gmail.com

Laureate Institute of Mgt and IT

BCA and BBA

Affiliated to H.P.U. - Shimla

laureateit@gmail.com, www.laureteintituteit.com

Laureate Institute of Education

Laureate Public School - Shimla

Nursery to XII

Affiliated to C.B.S.E. New Delhi

www.lauretegs.in, laureate93@gmail.com

and Training - Shimla

B.Ed

Affiliated to HPU Shimla

laureate93@gmail.com

V.P.O. Kathog, Tehsil Jawalmukhi, Distt. Kangra H.P. 176031

Contact : 09218428040, 09805676721, 09418028040, 7018933755