



# The NGS MIPS Herald

The Official news letter of the Nitte Gulabi Shetty Memorial  
Institute of Pharmaceutical Sciences, Mangalore



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## Experimentation in Animals

### VISION

To build a humane society through excellence in education and health care.

### MISSION

To develop Nitte University as a centre of excellence, imparting quality education, generating competent, skilled manpower to face the scientific and social challenges with a high degree of credibility, integrity, ethical standards and social concern.

*'For Private Circulation Only'*



### *From the Editor's desk*

Friends,

I believe that the quality of research work among our post graduate/PhD students is strongly influenced by the kind of mentoring that we teachers and research guides provide to them. Mentoring often involves a one to one relationship in which the mentor encourages and guides the student with the development of a sound research project with well defined methodology and research design. A mentor should be able to share knowledge and skills, monitor the student's progress in his/her research work and may also assist in career counseling. The support should be a continuous one with the progression of the research project. In Universities abroad, there are definite guidelines for research supervisors and mentors since for undergraduate research the latter are expected to have a greater role to play in the growth and development of students involved in these projects. Thus the outcome of good mentoring would be development of research skills; enrichment of intellectual curiosity and logical thinking which are important attributes for establishing the student as an independent researcher whose success is entirely based on how he /she was mentored while still a UG/PG student.

Finally it is not just the student who benefits from good mentoring, but is essential for the success of the mentor or faculty besides teaching, research and publication. Eventually, the accomplishments of the student will reflect on the mentor and increase his professional stature as well as that of the institution or university.

**Dr. Marina Koland**  
Executive Editor

### *Inauguration of New Premises of NGSMIPS/NUCSER*



### *One day workshop on Pharmacognosy and Phytochemistry*



## CAMPUS BUZZ

### Industry – Institute Collaboration Program

The Industry – Institute Collaboration and Placement Cell of NGSMIPS arranged an interaction between corporate executives from Semler Research Center Pvt. Ltd, Bangalore and post graduate students and Final Year B.Pharm students. Dr. K. Bopanna, President and CEO, Dr. Nagendra N, Head – Clinical and regulatory division, and Mr. K. Ram Prasanna, Associate Director (Business Development) were invited to address the students. The speakers explained the expectations of the industry from the students by the pharma companies and addressed the questions from them with respect to pharmacovigilance, competition in the area of clinical trials, regulatory affairs etc. The session was concluded by Dr. Bopanna who emphasised on ethical values, and how they were essential to be successful professionals in the workplace.

### One Day Workshop for High School Teachers in Pharmaceutical Research

In an attempt to create awareness among the High Schools and Junior colleges in and around Mangalore of the numerous possibilities of producing science projects in Pharmaceutical Sciences, a workshop was organized on 10<sup>th</sup> January 2015. The work shop entitled, “Experiments in Pharmaceutical Research” was arranged by the Principal and teaching faculty of NGSMIPS for High School teachers as per their request. The workshop held in two sessions included presentations from various departments of NGSMIPS covering various areas of Pharmaceutical research. There were also practical demonstrations which generated a good deal of interest among the school teachers. A positive feedback from the teachers indicated their satisfaction and they expressed their gratitude to the institution for giving them the opportunity to participate in such a workshop.

### NGSMIP organizes Swachh Bharat Abhiyaan

In coordination with the NSS unit, NGSMIPS arranged another campaign of Swachh Bharat Abhiyaan on 13th January, 2015 at the college premises. Students and faculty participated in this program along with NSS volunteers and officers picking up litter and waste found around the college campus and the adjacent area.

### ProQuest – unlimited free access to information offered by NGSMIPS to students and faculty

A demonstration of the Library Digital Archive software namely, ProQuest was arranged for students, research scholars and faculty members on February 10, 2015 and coordinated by Mr. Chandrashekar, Librarian. NGSMIPS has subscribed to a cross-disciplinary research tool, ProQuest which is considered to be the largest single academic research resource available. The objective was to provide ‘unlimited free access to unparalleled information’ to students, research scholars and faculty and would be an important tool in preparing dissertations, research publications etc. ProQuest’s renowned abstracting and indexing enables researchers to find sources in their area of study quite easily. Mr. Vikram Sudhakar from ProQuest gave a detailed demonstration and explained the nuances of this software and answered questions from the students and faculty.

### A one day workshop on Pharmacognosy and Phytochemistry

The Department of Pharmacognosy of NGSM Institute of Pharmaceutical Sciences, Paneer and Department of Botany of St. Aloysius College, Mangalore, jointly organized a one day workshop on “Pharmacognosy and Phytochemistry” sponsored by Department of Biotechnology, Ministry of Science and Technology, Government of India, on 17<sup>th</sup> February 2015. The workshop was organized to give hands on experience of Pharmacognosy and Phytochemistry practicals to the students of B. Sc in Botany of St. Aloysius College, Mangalore. Dr. C.S. Shastry, Principal, NGSM Institute of Pharmaceutical

Sciences gave a brief introduction about Pharmacognostical research work and its interrelationship with Botany. Dr. Sureshnath, Head, Department of Human Resources, and Dr. K. V. Nagalakshamma, Head, Department of Botany, St. Aloysius College advised their students to utilize the opportunities to familiarize with medicinal plants and herbs. Dr. Santanu Saha, Asst. Professor, Department of Pharmacognosy, NGSMIPS, lectured on extraction, isolation, identification and chemical test of phytoconstituents. The lectures were followed by demonstrations and hands on practical work on the morphological, microscopical and quantitative microscopical study of crude drugs.

### Inauguration of New Premises of NGSMIPS/NUCSER

The new block of NGSMIPS was inaugurated on 27<sup>th</sup> Feb, 2015 by Sri. N. Vinay Hegde, Chancellor, Nitte University after Ganapathi Havana and Saraswathi Pooja was conducted on the new premises. The ceremony which was coordinated by Dr. C.S. Shastry, Principal of NGSMIPS was also attended by Mr. Vishal Hegde, Pro-Chancellor (administration), Nitte University; Mr. M. Rajendra, Director (F&P) Nitte Education Trust; Dr. M.S. Moodithaya, Registrar, Nitte University; Dr. Alka Kulkarni, Controller of Examinations, Dr. Satheesh Bhandary, Dean of KS Hegde Medical Academy and other officers of the University as well as by staff and students of NGSMIPS. The new block will have state of the art infrastructure and facilities for Nitte University Centre for Science Education and Research (NUCSER) as well as for advanced research, pre clinical trials by PG, PhD students and research scholars of all departments of NGSMIPS. There was also a brief presentation by Dr. Mudit Dixit, Asst. Professor on various aspects of Regulatory Affairs, the PG labs of which will also be housed in the new block.

### Guest Lectures

Several guest lectures were organized for the benefit of students and faculty.



*Dr. Anantha Naik  
Nagappa*

Dr. Anantha Naik Nagappa, Professor; Dr. Uday Venkat Mateti, Research Scholar; Mr. Kanav Khera, Asst. Professor and Mr. Asim Priyendu representing various departments of MCOPs, Manipal University presented a series of lectures on 21 February, 2015 on topics such as ‘Opportunities of pharmaceutical care’, ‘Emerging comparative effectiveness research: need of the day’, ‘Ethical issues in Biomedical Research’ and ‘Introduction to pharmacoeconomics’ respectively. These lectures were organized by the Department of Pharmacology and were well received by PG students and teaching faculty.



*Dr. Raghunandan H V*

On February 14, 2015 a lecture by Dr. Raghunandan H V, Deputy Director – Academics, JSS University, Mysore was organized on the subject, ‘Pharmaceuticals/ Health Care Growth and Carrier Opportunities’ by the Department of Pharmaceutics at the NIBF auditorium, Paneer Campus. In his lecture, Dr. Raghunandan stressed the importance for young graduates to be innovative, adaptable, develop creative thinking and effective communication skills as well as the ability to work under pressure. This discourse was attended by staff, M.Pharm and final year B.Pharm students of NGSMIPS.

The Department of Pharmacy Practice arranged a lecture by Dr. H. J. Hrishikeshavan, Director & Professor, Pharmaceutical & Clinical Affairs, Nargund Research Foundation Bangalore on March 14, 2015. In his lecture on the topic, 'Bridging the gap between the Pharmacist and the Clinician', Dr. Hrishikeshavan highlighted the areas where a Clinical Pharmacist and the Physician or other health care provider could interact in a manner so that the patient experiences the best possible health outcome from medications prescribed.

### College day celebrations



Shri. Raghuram Bhandary, lights the inaugural lamp

The Institution celebrated College day on March 12, 2015 at the KSHEMA auditorium. The program was inaugurated by the Chief Guest, Shri. Raghuram Bhandary, Drugs Controller, Govt of Karnataka. Also present were Dr. Sathesh Bhandary, Dean of K.S. Hegde Medical Academy, Dr. Rajshekar, Director of

Curriculum Development, Nitte University, Mr. K. V. Nagaraj, Mr. Shankar Nayak, Asst. Drugs Controllers and Mrs. Ashalatha, Drugs Inspector. In his address to faculty and students, Dr. Bhandary said that the pharma sector have large number of opportunities for the pharma graduates and job openings are available in the Govt. sector as well in the private sector such as Contract Research Organizations. He said that it was the duty of the pharma fraternity and the physicians to combat the growing menace of sale of drugs without prescriptions which was endangering human lives.

Awards and prizes were distributed to students in academic excellence as well as in cultural and literary competitions that were held recently.

### Sports Activities



The NGSMIPS Boys football team won first place in the Nitte University Inter Collegiate Football Tournament held on 27<sup>th</sup> and 28<sup>th</sup> January 2015 at Mangalore University Grounds.

The Boys team also secured the second place in Badminton while the Girls Throw Ball team won second place in the Nitte Kreedotsav 2015 events held on 13<sup>th</sup> and 14<sup>th</sup> February 2015 at NMAM Institute of Technology, Nitte.



### Industrial visit for Final Year B.Pharm students



Final Year B.Pharm students in front of Colorcon Asia Private Ltd, Goa

An industrial visit to Goa for Final Year B.Pharm students was arranged by the institution as part of their co-curricular activities. Forty five students were accompanied by Mr. Jobin Jose, Asst. Professor and Mr. Sandeep, Asst. Professor, Department of Pharmaceutics. This trip lasting for four days from 3<sup>rd</sup> March to

6<sup>th</sup> March 2015 included visits to four industries: Colorcon Asia Private Ltd, Unichem Laboratories Ltd, Abbott India Limited and Blue Cross Laboratories Ltd.

## DEPARTMENT ACTIVITIES

### DEPARTMENT OF PHARMACEUTICAL CHEMISTRY

#### RESEARCH PUBLICATIONS

**DR. JANE T JACOB**, Assoc. Professor

Validated HPTLC technique for simultaneous estimation of candesartan cilexetil and hydrochlorothiazide in pharmaceutical dosage form. *Saudi Journal for Health Sciences* 2014; 3(3): 141-146

**MR. ABHISHEK KUMAR**, Asst. Professor

Synthesis, Antimicrobial and Antitubercular Activities of Some Novel Carboxamide Derivatives of 2-Quinolones. *Oriental Journal of Chemistry* 2014; 30(4): 1993-1997.

#### PAPERS PRESENTED AT CONFERENCES

**Mr. Abhishek Kumar** participated and presented a paper as oral presentation on the research paper entitled, "Synthesis and Biological Evaluation of Some Novel 2-Mercapto Pyrimidine Derivatives", in the National Seminar on "New Vistas in Biological Sciences" held at St Aloysius College (Autonomous), Mangalore on 15<sup>th</sup> and 16<sup>th</sup> January 2015.

### DEPARTMENT OF PHARMACEUTICS

#### RESEARCH PUBLICATIONS

**DR. MUDIT DIXIT**, Asst. Professor

1. Drug Product Registration in US, Europe, Japan and Canada for new drug and Generics. *Research & Reviews: A Journal of Drug Formulation, Development and Production*. Vol. 1, Issue 3, 2014, pp. 1-7

2. Regulatory Requirement for Pharmaceutical Marketing in USA, EU and GCC: A Comparison. *Research & Reviews: A Journal of Drug Formulation, Development and Production*. Vol. 1, Issue 3, 2014, pp. 1-6
3. Pharmaceutical Drug Product Registration and Requirements in Latin American Countries. *Research & Reviews: A Journal of Drug Formulation, Development and Production*. Vol. 1, Issue 3, 2014, pp. 1-9
4. Improvement of the Solubility and Dissolution of Tolfenamic acid using Lyophilization Technique. *International Journal of Pharmaceutical Research and Bio-Science*, Vol. 3, Issue 6, 2014, pp. 231-241
5. Preparation and Characterisation of Microparticles of Tenoxicam. *International Journal of Pharmaceutical Research and Bio-Science*, Vol. 3, Issue 6, 2014, pp. 221-230
6. Preparation and Characterisation of Solid Dispersion of Ezetimibe. *International Journal of Pharmaceutical Research and Bio-Science*, Vol. 3, Issue 6, 2014, pp. 258-268
7. Enhancing Solubility and Dissolution of Fenofibrate by Spray Drying Technique. *International Journal of Pharmacy and Pharmaceutical Sciences*, Vol. 7, Issue 1, 2014, pp. 1-5

**MR. JOBIN JOSE**, Asst. Professor

1. Formulation and Comparative Evaluation of Mouth Dissolving Films of Naratriptan Hel using Different Film Forming Agents. *International Journal of Pharmacy and Integrated Life Sciences* Dec. 2014; 3(1): 16-30
2. Evaluation of the efficacy of 2% curcumin gel in the treatment of experimental periodontitis. *Pharmacognosy Research* Oct-Dec 2014; 6(4): 326-333

**MR. SANDEEP D.S.**, Asst. Professor

Comparative study of superdisintegrants using antiemetic drug as a model. *Nitte University Journal of Health Sciences* March 2015; 5(1): 40-44.

#### STUDENT ACTIVITIES

The following students of Second Year M.Pharm presented research papers as poster presentations at the 66<sup>th</sup> Indian Pharmaceutical Congress held in Hyderabad, 23<sup>rd</sup> – 25<sup>th</sup> January, 2015

1. Mr. Lenson D'Souza (Pharmaceutics) – 'Development and *in vitro* evaluation of PVA – Chitosan based Gastro-retentive unfolding film type drug delivery system of Famotidine'. This paper was co-authored by Dr. Marina Koland, Professor.
2. Ms. Shruthi M (Pharmaceutics) – 'Formulation and evaluation of floating *in situ* gel drug delivery system of Valacyclovir hydrochloride'. This paper was co-authored by Dr. R.N.Charyulu, Professor
3. Mr. Shanon Mascarenhas (Pharmaceutics) – 'Formulation and evaluation of emulgel incorporated with antifungal agent for the treatment of topical fungal infection'. This paper was co-authored by Mr. Amit Patil, Asst. Professor
4. Ms. Nandini (Pharmaceutics) – 'Liquisolid tablet technology of combination of Baclofen and Nimesulide: a novel technique to improve dissolution rate'. This paper was co-authored by Mr. Amit Patil.
5. Mr. Deepak Bhandary (Regulatory Affairs) – 'Regulatory affair requirement of 505 (B)(2) New drug Application with US FDA'. This paper was co-authored by Dr. Mudit Dixit, Asst. Professor, Mr. Praveen Agarwal and Mr. Abdul Rasheed.
6. Mr. Abdul Rasheed (Regulatory Affairs) – 'Marketing authorization procedure and requirements for registration of pharmaceutical products in the European Union'. This paper was co-authored by Dr. Mudit Dixit, Mr. Praveen Agarwal and Mr. Deepak Bhandary.

#### Student Project

Ms. Sofia Sunny and Ms. Thrpthi Shetty, students of final year B.Pharm were granted financial assistance from VGST, DST, Govt. of India for the project (SPICE) entitled, "Formulation and Evaluation of *Anacardium occidentale* Gel for anti-microbial property in periodontal diseases" under the guidance of Dr. R. Narayana Charyulu.

#### DEPARTMENT OF PHARMACOLOGY

##### WORKSHOPS/SEMINARS ATTENDED

**Dr. Himanshu Joshi**, Asst. Professor & **Dr. Gururaja M.P.**, Asst. Professor attended the 2nd Annual Convention of the International Society for Pharmacoeconomics and Outcome Research- Karnataka Chapter at MCOPS Manipal, on 6-8<sup>th</sup> March 2015.

#### DEPARTMENT OF PHARMACY PRACTICE

##### PAPERS PRESENTED AT CONFERENCES

**Mrs. Neethu Fathima Umar** secured second position in poster presentation competition conducted at the 2<sup>nd</sup> Annual National Convention from 6-8 March 2015, Manipal for the poster entitled "A Study on ADR'S, Associated Factors & Pharmacoeconomic impact among the inpatients of a tertiary care Hospital in Dakshina Kannada".

#### DEPARTMENT OF PHARMACOGNOSY

##### RESEARCH PUBLICATIONS

**MR. ATANU BHATTACHARJEE**, Asst. Professor

1. Nootropic activity of *Crataevanurvala* Buch-Ham against scopolamine induced cognitive impairment, *EXCLI Journal* 2015; 14: 335-45.
2. Neuroprotective activity of *Crataevanurvala* Buch-ham stem bark against scopolamine- induced cognitive impairment via anti oxidative activities in rats. *American Journal of Ethnomedicine* 2014; 1(6): 371-83.

#### DEPARTMENT OF LIBRARY AND INFORMATION CENTRE

**MR. CHANDRASHEKHAR D.**, Librarian

Published and presented a paper entitled, "Applications of Total Quality Management in Library and Information Centre" at the 2 day International Conference on "Building Knowledge Centres" on 1<sup>st</sup> & 2<sup>nd</sup> January, 2015 held at NMAM Institute of Technology, Nitte, Karkala

Attended and presented a research paper as Poster entitled, "Bibliometric Analysis of Indian Journal of Pharmaceutical Education & Research (2010-2012)" at the 10th International Conference CALIBER-2015, 12-14th March 2015 at Himachal Pradesh University, Shimla, H.P.

## A FRUITY PUNCH TO THE BRAIN

Compiled by: **Ms. Beebi Shama C.**  
I M.Pharm, Department of Pharmacology

#### What is Cognition?

A scientific definition of cognition is given as a mental capacity that is concerned with memory, attention and reasoning abilities. As far as humans are concerned cognition may be conscious or unconscious, intuitive and conceptual.



However, there are various factors that affect cognition, such as: Age, mood disorders like anxiety and depression, improper sleep pattern, post-operative factors etc.

Based on various studies carried out in the field of memory and cognition, a strong conclusion has been made to show the positive effect of various fruit phyto-constituents on cognitive aspect of psychopharmacology. Studies have reported that flavonoids, with special reference to flavanols and anthocyanins, have triggered actions favoring the cognitive processes in mammals.

#### Animal Studies

The cognitive activity is contributed by fruits like; berries, apples, pomegranate and various other citrus fruits. To prove the activity of fruit flavonoids on learning and memory, a number of animal experimental studies have been carried out, where the animals were administered with 1-2% freeze dried fruit juice obtained from apples, strawberries, grapes, pomegranates and other flavonoid containing fruits. The results were amazing, which showed striking improvements in various parameters related cognition and memory, be it short term or long term memory.

#### Human Studies

The studies have also been carried out in human subjects especially in preventing memory loss caused due to age factor and also post operative cognitive dysfunction (POCD). The risk of cognitive decline increases with age. As per the study carried out by the National Institute on Aging, Maryland, USA, on elderly subjects, provided well established proof that the pomegranate extract had promising

influence on memory and cognition. Other studies on human subjects show the protective effect of pomegranate supplements against memory dysfunction post heart surgery.

**Mechanism of activity**

The exact mechanism of action of fruit flavonoids to enhance cognitive processes is unknown. However, they work by providing neuronal protection and enhance the neuronal function by preventing their degeneration. The neurons selectively interact with protein kinase and lipid signalling cascades to initiate gene expression by regulating transcription factors. This brings about increase in synaptic plasticity and increases the cerebrovascular blood flow. This occurs in 3 basic steps:

- 1) Interaction with neuronal signalling and synaptic function.
- 2) Influence on blood flow and neurogenesis.
- 3) Inhibition of neurodegeneration and neuro inflammation.

**Further Proofs**

Although the power and ability of cognition is based on the brain, it tends to undergo degeneration as the age progresses causing neuronal damage which affects the aspect of learning and memory. According to the neuropathology of many neurodegenerative disorders, it is established to be linked to oxidative stress suffered by the brain which in turn affects memory.

Thus, the earliest efforts to restore the cognitive function of the brain, was by the development of anti-oxidant preparation. Various secondary plant metabolites like poly-phenols gave much of contribution in this area when studied *in vitro*. However, the *in vivo*



studies in human and animal subjects by using naturally occurring supplements like *Vitis vinifera* (grapes), *Punica granatum* (Pomegranate), *Camellia sinensis* (tea) and others have triggered positive effects in cognitive functions of the brain. But, the striking observation was that they

had a group of phyto-chemical in common, which was flavonoid.

It was earlier assumed that this activity of flavonoid on the brain was mainly due to its anti-oxidant property by scavenging the reactive species or intervening in the red-ox reactions of the cell. However, it now a framed fact that the flavonoids protect the neurons against damage, enhance the blood flow to the brain, thus, bringing about neurogenesis. Since the studies showed that the anti-oxidant concentration in the brain after flavonoid treatment was very low, the former theory was rejected.

**The Obstacles**

Even though the plant based dietary supplements shows profound results in combating neurodegenerative disorders and chronic oxidative stress-related disorders, it is a shocking discovery that these natural supplements could pose slight risk.

According to the latest studies carried out by the Department of Internal Medicine and Public Health at the University of L'Aquila, Italy; flavonoid-rich food also called "Mediterranean Diet" is capable of increasing the cardiovascular risk quite slightly. This effect is attributed to the presence of flavones. On the whole flavonoids possess the potential of multiple health benefits. Data collected from the focus group discussions in Finland, France and the Netherlands showed the possibility of enhancing the nature of the flavonoid content present in the fruits and vegetables.

**Conclusion**

Although the field of neuroscience and psychopharmacology is in a continuous process, a great deal of advancement has been done to unveil the secrets to memory restoration. With the development of various memory models like Atkinson-Shriffin memory model to the Baddeley's model of working memory, several successes have been observed albeit with a pinch of criticism. So far, the drug treatments for neurodegenerative disorders have been unable to prevent the neuronal degeneration. Hence, a natural approach has been resorted to decipher the code to resetting the cognitive aspect of neuroscience and psychopharmacology with maximum benefits and minimum adverse reaction.

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1. Spencer JPE. The impact of fruit flavanoids on memory and cognition. British Journal of Nutrition. 2010; 104:S40-S47.
2. Ropacki SA, Patel SM, Hartman RE. Pomegranate supplementation protects against memory dysfunctioning after heart surgery: A pilot study. Evidence-based complementary and alternative medicine. Hindawi publishing corp. 2012;1-8.
3. Bookheimer SY, Renner BA, Ekstrom A, Zhaoping L, Henning SM, Brown JA, Jones M, Moody T, Small GW. Pomegranate juice augments memory fMRI activity in middle-aged and older adults with mild memory complaints. Evidence-based complementary and alternative medicine. Hindawi publishing corp. 2013; 1-14.
4. <http://www.nia.nih.gov/alzheimers/clinical-trials/pomegranate-extract-and-memory>.

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## HOW KIND AND HUMANE ARE YOU TO EXPERIMENTAL ANIMALS?

*By: Dr Himanshu Joshi, Asst. Professor  
& Dr Gururaja M.P, Asst. Professor  
Department of Pharmacology*



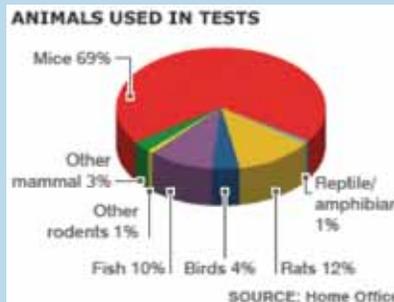
The experimental animals are used in medical and paramedical institutes mainly for biomedical research and pharmacology education. A number of laboratory animals i.e rodents, rabbits, cat, dog, monkey are an integral part of pre-clinical research, but in educational institutions, rodents such as rat, mice and non-rodents such as rabbits are commonly used. The use of laboratory animals has been a hot subject of debate in the last few years.

**Current Affairs regarding animal experimentation in India:**

- ❑ In 2003, the Pharmacy Council of India (PCI) issued a directive to all pharmacy schools in India to use CAL software in place of classroom animal experiments.
- ❑ In 2003, MCI's Executive Committee concluded: "As an alternative to these tests involving animals, JIPMER, Pondicherry has developed EX-PHARM CD. This CD has been specially prepared as a 100% replacement to animals

used in undergraduate courses in Medicine, Pharmacology, and Veterinary Science”.

- ❑ In 2008, PCI wrote to PETA India: “The council is not asking the institutions to do the mandatory practicals under Education Regulations 1991 by using animals. Instead the Council has issued instructions to institutions to use alternative measures to complete the syllabus”.
- ❑ In 2011, the University Grants Commission issued guidelines to phase out dissection and experimentation on live animals in zoology and life science courses.



With this changing scenario there is a need to change our perspective towards animal experimentation. It's not only by implementation of 3 R's in animal research i.e. Replacement (use of alternative methods or *in-vitro* methods), Reductions (reduce the number of animals being tested), Refinement (reduce pain and suffering to the animal) but also by Rehabilitation (an another R) even after experimentation.

We have to question ourselves as a responsible citizen how kind and humane are we to experimental animals. Now we don't have any option or choice in fact insuring the following points is the only way.

- \* Proper care of animal before, during and even after the experiment.
- \* Avoiding pain, distress and suffering to the animal.
- \* Avoiding poorly designed work.
- \* Novelty of the work.
- \* Animals should be handled only by trained and skilled persons.
- \* Study should have some outcome so that the use of animals can be justified.
- \* High ethical concerns, humane use, well defined standard protocols.

This is the only way to justify the use of experimental animals for the mankind. Without adopting the soft and humane refined procedures or practices in place of cruel approach, we will fail not only to justify the noble cause of working for the betterment of mankind and animals but it can also jeopardise the results.

**References:**

<http://timesofindia.indiatimes.com/india/Govt-bans-use-of-live-animals-for-education-research/articleshow/12696452.cms>

<http://timesofindia.indiatimes.com/city/bangalore/Animal-dissection-banned-in-colleges/articleshow/39784719.cms>

<http://timesofindia.indiatimes.com/city/bangalore/Pharmacy-students-banned-from-dissecting-animals/articleshow/41722224.cms>

**Present legislative status regarding Animal Experimentation in India:**

YEAR	LAW/REGULATION
1960	Prevention of Cruelty to Animals (PCA) Act 1960, amended 1982
1964	Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA)
1972	Wild life protection act
1992	Indian National Science Academy (INSA) “Guidelines for care and use of animals in scientific research”, revised 2001
1998	“Breeding of and Experiments on Animals (Control and Supervision) Rules, 1998”, amended 2001, 2006
2001	Indian Council of Medical Research (ICMR) “Guidelines for use of Laboratory animals in Medical Colleges”
2009	MCI amendment- Recommends to use alternatives to replace animal experiments
2012	Ministry of Health & Family Welfare bans use of animals in educational institutes.
2012	University Grants Commission (UGC) “Guidelines for discontinuation of dissection and animal experimentation in zoology/ life sciences in a phased manner”

**Gold Medal Winners 2013-14**



**Ms. Kripa G. S.**  
Sri. G. Venkatanarasamma Memorial Gold Medal for the best outgoing M Pharm Student

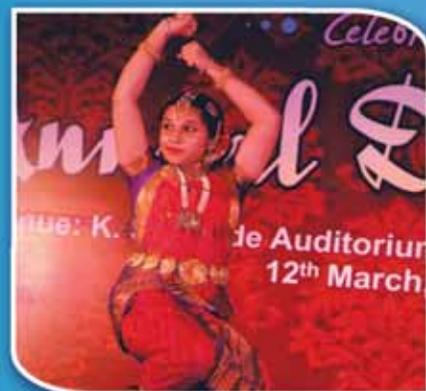


**Ms. Rithika Mascarenhas**  
K. Sriharsha Memorial Gold Medal for the best outgoing B Pharm Student

# One Day Workshop for High School Teachers in Pharmaceutical Research



## Collage Day Celebrations



Book Post