



The NGS MIPS Herald

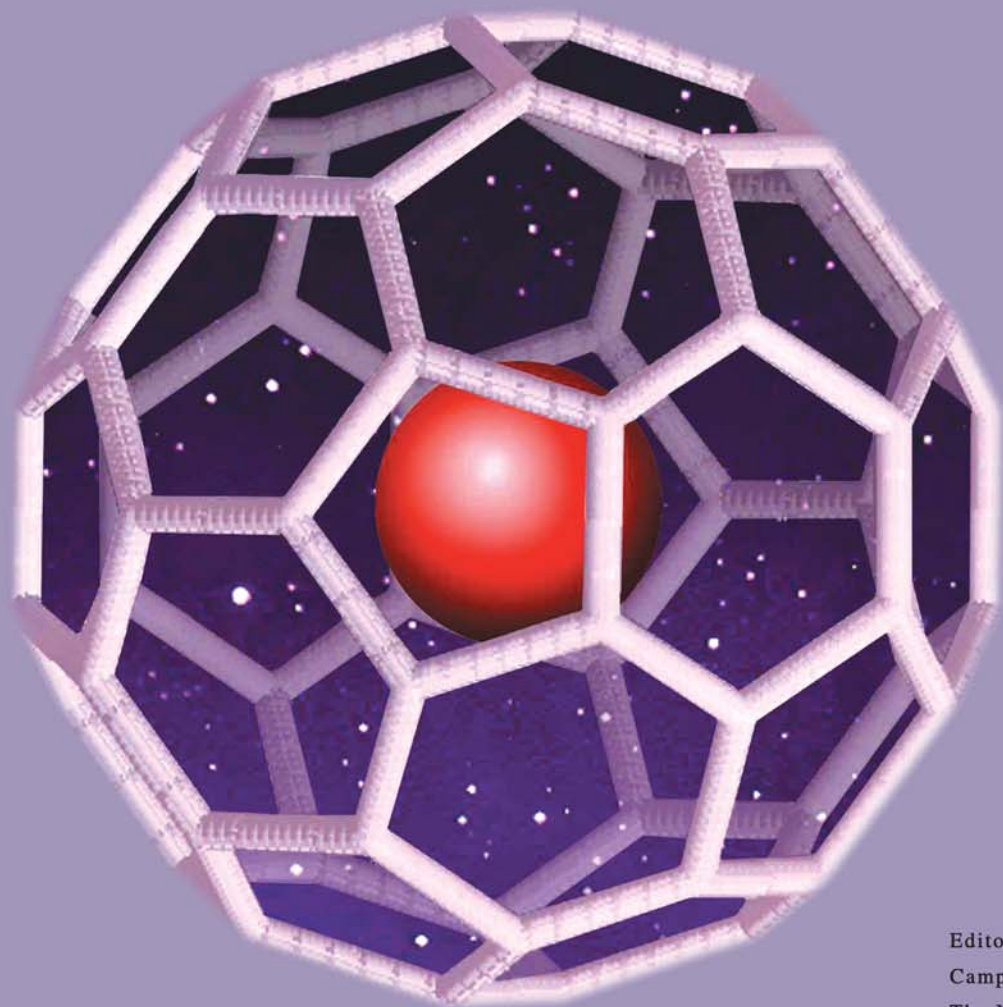
The Official news letter of the Nitte Gulabi Shetty Memorial
Institute of Pharmaceutical Sciences, Mangalore

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Fullerenes in Drug Delivery

Editor-in-Chief

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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

The buzz word in educational institutions in recent times is *research*. The regulating authorities like UGC have made it an important parameter during the evaluation process of the institutions. The academia is under pressure to excel in the area of research as many academic institutions couple the career advancement of the faculty with their research output. While the policy may deliver the desired result in institutions with postgraduate and doctoral programmes, it may not succeed in undergraduate institutions. This might lead to



- Sub standard research out put
- Intellectual dishonesty, plagiarism
- Erroneous results being published misleading subsequent researchers
- Drop in teaching standard

Unfortunately, research activities in most of the academic institutions is repetitive, superficial and publication driven. Perhaps it is the time for introspection and look into the problem more critically. Infusing the research culture in to the campus is a challenging task, but can be done by developing the infrastructure, rewarding the performers and decreasing the class room teaching work load. However, only the teachers with inherent aptitude for research will able to deliver the goods.

With the Government of India making decent allocation of funds for research projects, soon we can hope to make an impact in the scientific world with our fundamental and applied research. We have to be patient; one can not reap harvest immediately after sowing the seeds.

C.S. Shastry, Editor in- Chief



Guest Lectures

During the last few months, a number of eminent academicians and scientists were invited by the Institution to deliver lectures on different interesting subjects.

On 20th January, 2011, Dr. Vina Vaswani, Professor & HOD of Forensic Medicine, Yenepoya Medical College, Deralakatte lectured on “Chronic Industrial Toxicity”

Dr. Subrahmanyam K, Chief Interventional Cardiologist, KSHEMA, Deralakatte addressed the PG students and Faculty and discoursed at length on the topic, “Prevention of Heart Disease. This informative lecture also touched upon the use of stents with some good visuals as well as measures for maintaining good heart health.

Dr. A K. Sampath Kumar, Medical Superintendent, KSHEMA, Deralakatte, delivered a lecture on “Drug Abuse and its harmful effects” on 1st Feb 2011

A series of lectures on Statistics were arranged for the benefit of Post graduate students for a week. The lectures were delivered by Mr.Krishna Bhat, Associate Professor, Department of Statistics, College of Fisheries, Mangalore.



Dr. Sampath Kumar, Dr. Vina Vaswani and Dr. Subrahmanyam K. presenting their lectures

Campus Buzz

Group Discussions with Distinguished Alumni

Mr. Biju George, Pharmacist in-Charge, Sutter Pharmacy, California and Mr. Shibu George, Research Biochemist of Merck & Co., Inc. U.S.A, who are alumni of NGSM IPS visited the campus on 3rd January, 2011. Dr. C.S Shastry, Principal invited them to be a part of the development process of the institution. In an informative discussion with faculty, the two distinguished alumni gave an interesting perspective of working in the U.S as Pharmacy Professionals. Mr. Biju George, a community pharmacist gave a comprehensive account in the community pharmacy scenario in the U.S while Mr. Shibu George produced a presentation of the recent developments in the area of biotechnology. Both have expressed their eagerness to be in touch with the progress of the institution.



Cultural Week organized

A plethora of competitions in culture and art under the title, “Festin O Beats” were organized by the Student Council from 5th to 18th March, 2011. Students participated in large numbers with gusto in events like face painting, traditional costume, collage, ‘rangoli’, cooking, ‘mehendi’, calligraphy, pencil sketch etc.



NGSM IPS volleyball team wins second place

The college volleyball team won the second place in the Nitte University Inter Collegiate Volleyball Tournament held at A. B. Shetty Dental College, Derelakatte on 18th January 2011.

Mr. Jaseer of II M.Pharm (Pharmaceutics) has been selected for the Dakshina Kannada District Football team for the year 2011-2012



Ph.D Awarded



Mrs. Marina Koland, working as Associate Professor, Department of Pharmaceutics, NGSM Institute of Pharmaceutical Sciences, Mangalore, Karnataka, has been awarded Doctor of Philosophy (Ph.D) in Pharmacy for her thesis entitled “System Design of Mucoadhesive Buccal Films of Selected Drugs for Immediate and Sustained Release and their Characterization” by the Rajiv Gandhi University of Health Sciences, Bangalore. She has worked under the guidance of Dr. R. Narayana Charyulu, Vice-Principal & Head, Department of Pharmaceutics, NGSMIPS, Mangalore.



Mr. Harish NM, Research Scholar, Department of Pharmaceutics, NGSM Institute of Pharmaceutical Sciences, Mangalore, Karnataka, has also been awarded Doctor of Philosophy (Ph. D) in Pharmacy for his thesis entitled “Formulation and evaluation of Polymeric *in situ* gels for oral candidiasis” by the Rajiv Gandhi University of Health Sciences, Bangalore, under the guidance of Dr. R. NarayanaCharyulu, Vice-Principal & Head, Department of Pharmaceutics, NGSMIPS, Mangalore.



Best Alumni award



Dr. Prabhakara Prabhu, Associate Professor, Department of Pharmaceutics was presented the “Distinguished Alumni Award for the Year 2010” by the Manipal College of Pharmaceutical Sciences, Manipal.

THE MIGHTY TOMATO AND ITS BENEFITS IN HYPERTENSION

Compiled by : **Dr. Marina Koland**



Fresh tomatoes in your salad not only give you a good dose of antioxidants but also help to significantly lower your blood pressure. It is a known fact that

Italians are not plagued by heart disease since their diet consists predominantly of tomatoes in various forms such as pasta sauce. A recent double-blind study conducted in Israel has confirmed why Italians have enjoyed healthy hearts for centuries. It all has to do with red tomatoes, and their power to lower blood pressure, and the risk of heart disease.

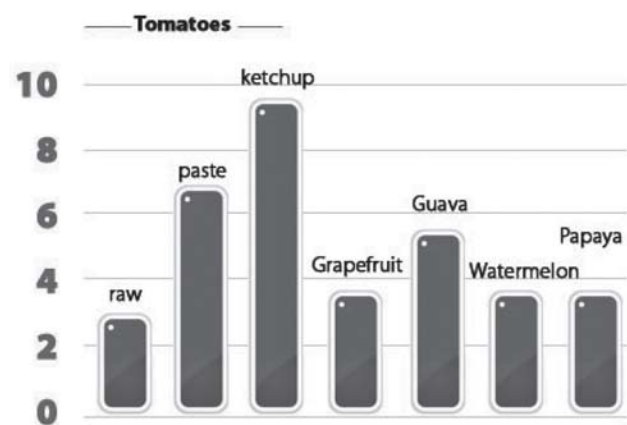
The Israeli study was led up by Dr. Esther Paran, head of the hypertension division of Soroka Medical Center. It involved patients who were already being treated for hypertension, but were not responding well to the medications. Dr. Paran had patients take a supplement of tomato extract. The results were a significant drop in blood pressure after just four weeks. Results showed a significant reduction in systolic blood pressure, from 144 mm Hg to 135 mm Hg, representing a mean 9 mm Hg reduction. Additionally, some favorable effects on diastolic blood pressure, blood lipids, lipoproteins, and oxidative stress markers were noted. This antihypertensive effect was attributed to the lycopene content in tomatoes. In fact, an Israeli company, Lycomato has been growing hybrid tomatoes which contain higher concentrations of this powerful antioxidant in each fruit. According to this study, adding tomatoes to your diet can reduce systolic blood pressure by 10 points and diastolic pressure by 4 points. Such an approach seems to be able to reduce blood pressure in grade 1 hypertensive patients and possibly produce a beneficial effect on cardiovascular risk factors.

Tomatoes are a rich-source of healthy nutrients including antioxidants such as lycopene, vitamins and minerals. Lycopene is a carotenoid and is a powerful antioxidant. The antioxidants from tomatoes act as a protector of nitric oxide levels, which in turn will assist in lowering blood pressure by relaxing the blood vessel walls. Lycopene has also been extensively studied for cancer preventing properties. It can even help keep LDL cholesterol from oxidizing which makes it stick to the arteries and narrow the passage way causing blood pressure to

increase. Tomatoes are also known to be a rich source of dietary potassium. Research indicates that high-potassium diets may protect against sodium-induced hypertension, according to an article published online in the Dec. 17, 2008 issue of "Hypertension".

The recommended amount of tomatoes that need to be consumed to have a positive impact on blood pressure is four whole tomatoes each day. This may be difficult; hence an alternative is to have them as salads, tomato juice, tomato puree cooked with pasta or tomato supplements can be taken. Lycopene is also found in water melon, papaya, pink grapefruit and pink guava. In contrast to β -carotene, it is not a precursor of vitamin A in humans. In plasma, lycopene represents almost half of the carotenoids.

Lycopene content of foods



adapted from: Gerster H.J. *Amer.Coll. Nut.* 15, 109 (1997)

REFERENCES

1. Effect of tomato's lycopene on blood pressure, serum lipoproteins, plasma homocysteine and oxidative stress markers in grade I hypertensive patients. Esther Paran and Yehiel Engelhard. *Am J Hypertens* (2001) **14**, 141A–141A
2. Tomato extract may help lower blood pressure. American medical Network. *American Heart Journal*, January 2006,

FULLERENES IN DRUG DELIVERY

Compiled by : **Dr. Marina Koland**

Fullerenes are a relatively new class of nanomaterials that have attracted considerable attention in different fields of science since their discovery in 1985. A fullerene is any molecule composed entirely of carbon, in the form of a hollow sphere, ellipsoid, or tube.. that represent a third form of carbon (e.g. diamond and graphite) and are spherical in shape – like a soccer ball. The most common fullerene sphere, called a “Buckyball,” contains 60 carbon atoms bound by single and double bonds that form a three-dimensional geodesic spheroidal crystal. For these “empty cages,” 60 or 70 carbon molecules are arranged in a cage structure and are water insoluble unless derivatized with hydrophilic compounds. The C₆₀ fullerene surface contains 20 hexagons and 12 pentagons (Fig. 1). All the rings are fused; all the double bonds are conjugated. In spite of their extreme conjugation, they behave chemically and physically as electron-deficient alkenes rather than electron rich aromatic systems



Fig. 1. The C₆₀ “buckyball” fullerene

Investigations of physical, chemical and biological properties of fullerenes have yielded promising information. It is inferred that size, hydrophobicity, three-dimensionality and electronic configurations make them an appealing subject in medicinal chemistry. Their unique carbon cage structure coupled with immense scope for derivatization make them a potential therapeutic agent. The study of biological applications has attracted increasing attention despite the low solubility of carbon spheres in physiological media.

The properties of fullerenes can be exploited through the addition of atoms within the cage or by the addition of surface chemistry and therefore present numerous possibilities for using these molecules in developing new drugs or improving upon current drugs. For example, the compounds can be used for specific targeting of cells and locations within the body after intravenous or subcutaneous injection.

Fullerenes (C₆₀) and their derivatives have potential antiviral activity, which has strong implications on the treatment of HIV-infection. The antiviral activity of fullerene derivatives is based on several biological properties including their unique molecular architecture and antioxidant activity. It

has been shown that fullerene derivatives can inhibit and complex with HIV protease (HIV-P). A Fullerene is able to fit inside the hydrophobic cavity of HIV proteases, inhibiting the access of substrates to the catalytic site of enzyme.

In diagnostic applications by carrying an unstable atom, for instance a metal atom, within the interior of the molecular cage forming so-called endofullerenes/metallofullerenes that would be able to isolate reactive atoms from their environment (Fig. 2). Metallofullerenes introduce no release of the captured metal atom under *in vivo* conditions, in contrast to metal chelates, they have a potential in diagnostic application. Endofullerenes can be applied as magnetic resonance imaging contrast agent MRI, X-ray imaging agent and radiopharmaceuticals.



Fig. 2. Metal atoms entrapped within the ‘cage’ of the fullerene

Fullerenes can also be used as radical scavenger and antioxidant. At the same time, if exposed to light, fullerene can produce singlet oxygen in high quantum yields. This action, together with direct electron transfer from excited state of fullerene and DNA bases, can be used to cleave DNA. In addition, fullerenes have been used as a carrier for gene and drug delivery systems.

The low toxicity detected so far in fullerenes, are sufficient to stimulate researchers in chemistry and in biology to unite their efforts and systematically investigate the biological properties of these fascinating molecules. A wave of research and development activities all over the world has led to large number of application-oriented patents, spanning a very broad range spectrum of potential commercial applications, including: anticancer drug delivery systems using photodynamic therapy, HIV drugs, and cosmetics to slow down the aging of human skin.

REFERENCES

1. Medicinal applications of fullerenes. Rania Bakry, Rainer M Vallant, Muhammad Najam-ul-Haq, Matthias Rainer, Zoltan Szabo, Christian W Huck, and Günther K Bonn. *Int J Nanomedicine*. 2007 December; 2(4): 639–649.
2. Fullerene Nanomedicines for Medical and Healthcare Applications. Charles Gause, Founder & VP of Corporate Development, Luna Innovations Inc., nanoWorks Division.

DEPARTMENT ACTIVITIES

DEPARTMENT OF PHARMACEUTICAL CHEMISTRY

Research Publications

DR. K. ISHWAR BHAT, Professor

1. Anthelmintic activity of *Tectona Grandis* Linn fruits. *International Research Journal of Pharmacy* 2011; 2(1):219-221.
2. *In-Vitro* Cytotoxic Activity Studies of *Clitoria Ternatea* Linn flower extracts. *International Journal of Pharmaceutical Sciences*. 2011; 6(2):120-121

DR. JENNIFER FERNANDES, Professor

Antiulcer activity of the methanolic & aqueous extract of the leaves of *Sapindus trifoliatus*., *International Journal of Pharmaceutical Sciences Review and Research* Volume 6, Issue 1, January – February 2011(25-26)

DR. JANE JACOB, Assoc. Professor

1. Spectrophotometric Methods for the Estimation of Duloxetine. *Journal of Pharmacy Research*. 2011; 4(2): 380-381.
2. HPLC and Spectrophotometric Estimation of Ezetimibe. *International Journal of Research in Pharmaceutical and Biomedical Sciences*. 2011; 2(1):241-44.

DR. PRERANA SHETTY, Assist. Professor

Antioxidant and Radiation Antagonistic Effect of *Saraca indica*. *Journal of Environmental Toxicology and Oncology* 2010; 29(1):69-79

Papers Presented at Conferences

Dr. Jennifer Fernandes, presented a poster on “Evaluation of the protective potential of *Coleus aromaticus* Benth.; extract on acetaminophen-induced liver damage “ at Dubai International Pharmaceuticals Technologies Conference & Exhibition (DUPHAT) 2011 held at Dubai International Convention & Exhibition Centre, Dubai, UAE on 22nd to 24th March 2011.

DEPARTMENT OF PHARMACEUTICS

Research Publications

DR. R. NARAYANA CHARYULU, Professor

Development of Enteric Coated polysaccharide beads intended for colonic drug delivery. *J Pharm Res*, 2010 9(4), 153-58

DR. PRABHAKARA PRABHU, Assoc. Professor

Development and evaluation of nano size coated liposomes of methotrexate for targeted drug delivery. *The AAPS Journal*, 12 (S2), 2010.

Papers Presented at Conferences

Dr. Narayana Charyulu presented a paper entitled, ‘Formulation and Clinical Evaluation of Flucanazole *In Situ* gels for Oropharyngeal Candidiasis’ at the BioPharma Asia Convention 2011 on the 29th and 30th March, 2011 in Singapore

Dr. Marina Koland, Presented a paper on “*In Vitro - In Vivo* evaluation of transmucosal permeation of ondansetron hydrochloride from chitosan buccal films”, at the 11th

International symposium on Advances in Technology & Business potential of New Drug Delivery Systems, organized by the Controlled Release Society-Indian Chapter (CRS-IC), Mumbai, 16th & 17th Feb 2011

Dr. Prabhakara Prabhu, Presented a paper entitled, “*In Vitro - In Vivo* evaluation of Levocetirizine dihydrochloride fast dissolving films”, at the 11th International symposium on Advances in Technology & Business potential of New Drug Delivery Systems, by CRS-IC, Mumbai on the 16th & 17th Feb 2011

Workshops/Seminars Attended

Dr. Marina Koland, Dr. Prabhakara Prabhu and Mrs. Nisha Girish Shetty attended a two day ICMR sponsored workshop on “Clinical Pharmacokinetics: Concepts and Applications” on February 4th and 5th, 2011. This workshop was organized by the Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal.

DEPARTMENT OF PHARMACOLOGY

Research Publications

DR. PRASHANTH SHETTY, Professor

Hepato Protective Properties of *Memecylon Umbellatum* leaves. *Int Journal Pharm Sci Bio*, 2(1):313-15, 2011

MR. GURURAJ M.P., Lecturer

1. Anthelmintic activity of *Tectona grandis* Linn fruits. *International Research Journal of Pharmacy* 2011; 2(1): 219-21.
2. Anti diabetic activity of Cow urine against streptozotocin induced diabetic rats. *Asian Journal of Traditional Medicine* 2011; 6(1):235-240.

MR. HIMANSHU JOSHI, Lecturer

1. Analgesic potential of the roots of *Memecylon umbellatum*. *International Research Journal of Pharmacy* 2010; 1(1): 395-400.
2. *Calotropis gigantea* R. Br (*Asclepiadaceae*): A review. *International Journal of Pharmaceutical Research* 2011; 3(1) Jan-Mar

Papers Presented at Conferences

Mr. Prasanna Shama K presented a paper as poster entitled, ‘The Anti Ulcer Activity of Stem and Root Bark of *Bauhinia Purpurea* Linn against Indomethacin Induced Gastric Ulcer in Rats’ at Dubai International Pharmaceuticals Technologies Conference & Exhibition (DUPHAT) 2011 held at Dubai International Convention & Exhibition Centre, Dubai, UAE on 22nd to 24th March 2011.

NONTEACHING FACULTY

Mr. Chandrashekhara D., Librarian, attended the 3rd Annual Conference of Karnataka Medical Association on 28th and 29th Jan 2011 at A.B. Shetty Memorial Institute. of Dental Sciences, Deralakatte, Mangalore.

He has also written a paper on “Open Access Initiatives in Health science Librarianship: An overview”

Scholarship for M. Pharm students



Miss Uchil Deepika

Ms. Uchil Deepika, II M.Pharm (Pharmaceutics) and Ms. Rajalakshmi of II M.Pharm (Pharmaceutical Chemistry) are the proud recipients of a scholarship bestowed by the Trustees of the **Sir Ratan Tata Trust**. Each of the students have been awarded Rupees 50,000/-



Miss Rajalakshmi



SINGAPORE CONFERENCE



Dr. Narayana Charyulu at the BioPharma Asia Convention 2011, Singapore



DUPHAT CONFERENCE

Dr. Jennifer Fernandes and Mr. Prasanna Shama K. at the Dubai International Pharmaceuticals Technologies Conference & Exhibition (DUPHAT) 2011



Cultural Week 5th to 18th March, 2011



Book Post