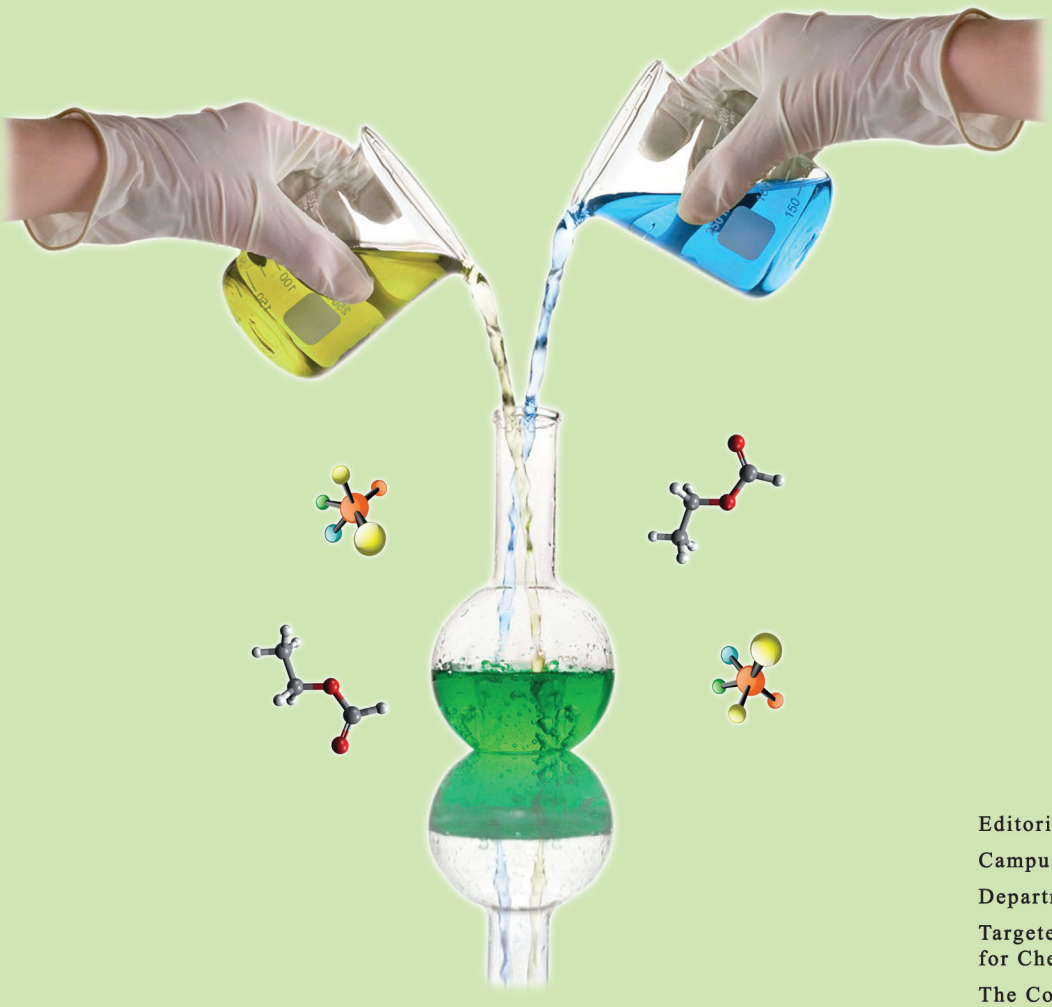
The NGSMIPS Herald

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

Volume - 3 Issue - 1 January - March 2012



Green Chemstry

Contents

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.

From the Editor's desk

Friends,

The editorial board is proud to bring out the first issue of the third volume of 'The NGSMIPS Herald'. We have successfully published 8 issues in two volumes of the years, 2010 and 2011. Yes, time has really flown; it seems only yesterday when the first issue was released by Sri. N.Vinaya Hegde, Chancellor of Nitte University. However the success of a publication depends largely on the quality of contributions in the way of articles. We are attempting to include more research articles.

We also hope to get our students to be actively involved by infusing some more life into 'The NGSMIPS Herald'. In this issue we have incorporated material from under graduate students who have expressed a keen interest to contribute to this publication. In the near future, we hope to include a 'Student Forum' so that opinions of students in matters related to the pharmacy profession can be heard

Marina Koland, ***Executive Editor.***

Guest Lectures

Dr. Thippeswamy delivers a lecture on 'Basic techniques in experimental Pharmacology'

Dr. Thippeswamy demonstrates animal experiments used in Pharmacology

Dr. CS Adiga gives a brief presentation on 'Merits and Demerits of semester system in undergraduate studies'

Students Handling Animals at the workshop

CAMPUS BUZZ

Cultural, Sports and Literary weeks organized

Several cultural, sports and literary competitions were conducted by the respective committees in February and March this year. The literary week was celebrated from 20th February to 9th March, aptly named as, 'Enthusia' included events such as essay writing, dumb charades, cartoon drawing, Poetry, collage, Quiz, cross word, Sudoku, calligraphy etc. The cultural week which was conducted from 22nd February to 6th March had some enthusiastic participation in events such as cooking without flame, face painting, rangoli, mehendi, antakshari etc. In addition a few new events were introduced this year such as Kite flying and Treasure Hunt.

Dr. C. S. Shastry lights the inaugural lamp at the Cultural Day in the presence of Dr. R. Narayana Charyulu

On March 10th, 2012"Cultural Day" was also celebrated at the K.S Hegde Auditorium, Derelakatte and was formally inaugurated by the principal, Dr. C.S Shastry. On that day, students showed off their talents by participating in a number of competitons in song, dance, fashion show etc. The first year B.Pharm students pleasantly surprised everybody with their amazing performances particularly in dance and fashion show.

Sports events such as carom, volleyball, throwball, cricket, football, kabbadi and table tennis matches for both men and women were organized in the months of January and February, 2012. and which were played on the college grounds. There was active participation from many students including staff.

Students of NGSMIPS at Sports tournaments

NGSMIPS boys won the runners up trophy at the Nitte Inter Collegiate Volleyball Tournament which took place on the 7th February, 2012. The match was played against K.S Hegde Medical Academy. On the same day the girls also bagged the runners up trophy again at the Throw ball tournament.

At the All India Inter College Pharmacy Cricket Tournament, Manipal, students of NGSMIPS played and won against National College of Pharmacy, Shimoga and entered the semi-finals on 29th March, 2012. Though the team lost to C.L. Mehta College of Pharmacy, Chennai, they still put up a good fight.

AICTE grant for the Department of Pharmaceutics

The All India Council for Technical Education (AICTE), New Delhi, has sanctioned a grant of Rs. 10 lakh to Dr. R. Narayana Charyulu, Vice-Principal and Head, Department of Pharmaceutics for the modernization of the Pharmaceutics laboratories of the Institution.

Staff Development program for the teaching faculty

The Staff Development College, Nitte University organized a one day program for the teaching faculty of NGSMIPS on the 24th of February, 2012. The program entitled, "Effective Teacher, Discovering One's self" was presented by Sr. Carmelita, Shantiniketan. It was well received by all the participants and many expressed an interest to attend similar programs.

Guest Lectures

A series of lectures by resource persons in the field of pharmacy practice, academics, and pharmacology were arranged by the Institution for the benefit of undergraduates, PG students and research scholars.

Dr.M.K. Unnikrishnan, Professor & Head, Dept. of Pharmacy Practice, MCOPS, Manipal delivered a lecture on 'Pharmacovigilance and Medication safety' on 23rd February 2012. The speaker highlighted the importance of reporting Adverse Drug Reactions (ADR) for safer therapy and how Pharmacovigilance is efficient in western countries while still nascent in India.

Mr. Himanshu Patel and Mr. Atiqulla Shariff, Teaching faculty, Department of Pharmacy Practice, J.S.S College of Pharmacy, Mysore presented lectures on 'Pharmaco-epidemology' and 'Rational Drug Use' respectively on 24th March, 2012. These lectures were attended by PG students from the Department of Pharmacy Practice.

Dr. CS Adiga, Deputy Registrar- Academic, Manipal University, Manipal gave a brief presentation on 'Merits and Demerits of semester system in undergraduate studies' which was attended by the teaching faculty. In his lecture, Dr. Adiga explained the benefits of the semester system for both the teacher and the student as opposed to the annual system.

A work shop was organized on 30th and 31st March, 2012 on 'Experimental Pharmacology'. It included a lecture from Dr. Thippeswamy BS, Professor and Head, Dept. of Pharmacology, Sri Siddaganga college of Pharmacy, Tumkur on 'Basic techniques in experimental Pharmacology'. On the second day, Dr.Thippeswamy also demonstrated a number of animal experiments.

DEPARTMENT ACTIVITIES

DEPARTMENT OF PHARMACEUTICAL CHEMISTRY

Research Publications

DR. D.SATYANARAYANA, *Professor*

1. Analgesic and anti-inflamatory activity of *ficus glomerata* in experimental animal models, ***International Journal of Pharmaceutical Sciences and Nanotechnology***. Vol-4, Issue3: October-December 2011:1501-1504.
2. Synthesis and evaluation of anti-inflammatory and analgesic activity of 3-[(5-substituted-1, 3, 4-oxadiazol-2-yl-thio)acetyl]-2H-chromen-2-ones, Med. Chem. Res.(2012) 21:16-26.
3. Antidiabetic Potential Of Cow Urine In Streptozotocin-induced Diabetic rats, ***Asian J. Traditional Medicine,*** 2011, 6(1);8-13.
4. Anthelmintic activity of *tentona grandis linn* fruits, ***International Research Journal of Pharmacy,*** 2011, 2(1); 219-221.

DR. K.ISHWAR BHAT, *Professor*

1. Antimicrobial and Cytotoxic Evaluation of (E) - Thienyl Chalcones Derived from Thiophene - 2- carbaldehyde. ***Pharmacologyonline***. 2011; 3:880-888.
2. Synthesis, Pharmacological and Biological Screening of New Isoxazolines. ***Indian J Heterocycl Chem***. 2011; 21:163-166.
3. Synthesis and Biological Screening of Some 1, 3, 4 – Oxadiazoles. ***Indian J Heterocycl Chem***. 2011; 21:183-184.

MR. ABHISHEK KUMAR, Lecturer

1. Synthesis, Characterization and Antidiabetic Evaluation of Novel Coumarin Analogues. ***Pharmacologyonline.*** 2011; 3:1061-76.
2. Click Chemistry: An Approach to Sustainable Development in Drug Synthesis. ***International Journal of Current Research and Review***. 2012; 4(2):22-31.

PAPERS PRESENTED AT CONFERENCES

Mr. Abhishek Kumar presented a Poster on the research paper entitled, "Synthesis, Antimicrobial, Analgesic and Anti-inflammatory Activity of some Isoxazoline Derivatives" at the Scientific Poster Session of the IPA Convention 2012 held at Manipal during 17th- 18th March, 2012.

DEPARTMENT OF PHARMACEUTICS

RESEARCH PUBLICATIONS

DR. R. NARAYANA CHARYULU, *Professor*

Formulation, optimization and evaluation of a gastro buoyant multiparticulate system of lansoprazole using hypromellose phthalate. ***Inventi Rapid: NDDS***, Vol. 2012; Issue 2. Available from http://inventi.in.

DR. MARINA KOLAND, *Professor*

1. Bioadhesive polymeric matrix patches for buccal delivery of Tizanidine Hydrochloride and Diclofenac Potassium. ***The AAPS Journal***, October 2011; Abstract T2196. Available from http://www.aapsj.org/abstracts.
2. Investigation of nano lipid vesicles of methotrexate for anti-rheumatoid activity. ***International Journal of Nanomedicine*** 2012; 7: 177-186
3. Mucoadhesive microspheres of famotidine for gastroretentive drug delivery. ***Int. J. Drug Dev. & Res.*** 2012; 4(1): 59-64

MRS. NISHA GIRISH SHETTY, *Senior Lecturer*

Investigation of an In Situ Gel forming Solution of Imidazoline Drugs for Ocular Administration. ***The AAPS Journal***, October 2011; Abstract R6224. Available from http://www.aapsj.org/abstracts

New Treatment for Cancer

Scientists have used low-intensity electromagnetic fields to treat cancer patients in trials which they say could lead to the development of a new type of anti-tumour therapy.

Patients hold a spoon-shaped antenna in their mouths to deliver a very low-intensity electromagnetic field in their bodies. The investigation was carried out by a team of scientists from US, Brazil, France and Switzerland under their leader, Professor Boris Pasche of the University of Alabama, Birmingham. In trials of patients with advanced liver cancer, the therapy – given three times a day – resulted in long-term survival for a small number of those monitored, the team has reported in the *British Journal of Cancer*. Their tumours shrank, while healthy cells in surrounding tissue were unaffected.

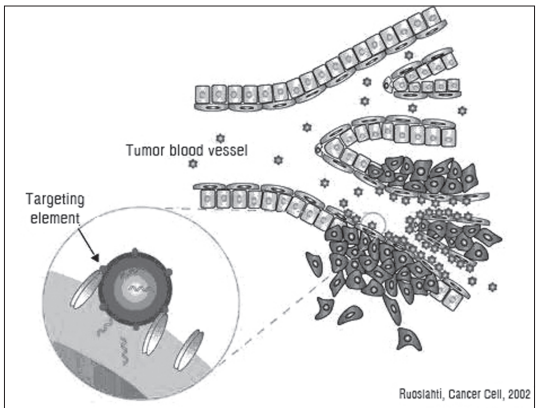
The exact mechanism for this process was not explained in the paper. However, results of recent experiments by the team – using cancer cell cultures in the laboratory and published in the *British Journal of Cancer*– suggest that low-level electromagnetic fields interfere with the activity of genes in cancer cells. In specific cases, this affected the ability of cancer cells to grow and divide. The spread of tumours halted and in some cases they began to shrink.

Courtesy: The Guardian/The observer, January 8th, 2012

TARGETED NANOPARTICLE DESIGN FOR CHEMOTHERAPY

Compiled by: **Vivek Ghate**
IV Year B.Pharm

In 1970's Cisplatin was the drug used in chemotherapy in the treatment of various types of cancers, including sarcomas, some carcinomas (e.g. small cell lung cancer, and ovarian cancer), lymphomas, and germ cell tumors. It was the first member of a class of platinum-containing anti-cancer drugs, which now also includes carboplatin and oxaliplatin. These platinum complexes react in vivo, binding to and causing cross linking of DNA, which ultimately triggers apoptosis. The problem with cisplatin was its adverse side effects like neurotoxicity, nephrotoxicity, ototoxicity, electrolyte imbalance, nausea and vomiting. Another problem with cisplatin was its relatively short lifetime in the bloodstream. Only about 1 percent of the dose given to a patient ever reaches the tumor cells' DNA, and about half of it is excreted within an hour of treatment.



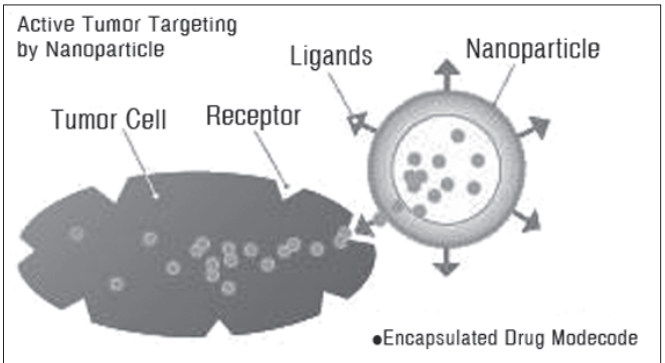
Targeting Cancer Cell

To prolong the time in circulation, the researchers from Massachusetts Institute of Technology (MIT) and Brigham and Women's Hospital (BWH) decided to encase a derivative of cisplatin in a hydrophobic nanoparticle. First, they modified the drug, which is normally hydrophilic, with two hexanoic acid units — organic fragments that repel water. That enabled them to encapsulate the resulting prodrug, a form that is inactive until it enters a target cell in a nanoparticle.

Using this approach, much more of the drug reached the tumor. The researchers found that the nanoparticles circulated in the bloodstream for about 24 hours, at least 5 times longer than un-encapsulated cisplatin. They also found that it did not accumulate as much in the kidneys as conventional cisplatin. To help the nanoparticles reach their target, the researchers also coated them with molecules that bind to PSMA (prostate specific membrane antigen), a protein found on most prostate cancer cells. The researchers tested their effectiveness by treating mice implanted with human prostate tumors. They found that the nanoparticles reduced tumor size as much as conventional cisplatin over 30 days, but with only 30 percent of the dose.

Using the same principle of encapsulating the drug as a nano particle, the researchers have also developed a drug named 'BIND-014' which has entered Human Clinical Studies. In the study, the researchers demonstrate BIND-014's ability to effectively target a receptor expressed in tumors to achieve high tumor drug concentrations, as well as show remarkable efficacy, safety and pharmacological properties compared to the parent chemotherapeutic drug, docetaxel (Taxotere). In the study, the researchers produced data that include pharmacokinetic characteristics consistent with prolonged circulation and controlled drug release with plasma concentrations remaining up to at least 100-fold higher than conventional docetaxel for over 24 hours, as well as up to a 10-fold increase in intratumoral drug concentrations with prolonged and enhanced tumor growth suppression in multiple tumor models compared with conventional docetaxel.

This type of nanoparticle design could be easily adapted to carry other types of drugs or even more than one drug at a time. They could also be designed to target tumors other than prostate cancer, as long as those tumors have known receptors that could be targeted.



Nanoparticle - Targeting - Tumor

References:

1) "Targeted delivery of cisplatin prodrug for safer and more effective prostate cancer therapy in vivo," by Shanta Dhar, Nagesh Kolishetti, Stephen J. Lippard, and Omid C. Farokhzad. Proceedings of the National Academy of Sciences, 10, January 2011

2) http://www.sciencedaily.com/releases/2011/01/110111133025.html

3) J. Hrkach, D. Von Hoff, M. M. Ali, E. Andrianova et al. Preclinical Development and Clinical Translation of a PSMA-Targeted Docetaxel Nanoparticle with a Differentiated Pharmacological Profile. Science Translational Medicine, 2012; 4 (128): 128ra39 DOI: 10.1126/scitranslmed.3003651

4) http://www.sciencedaily.com/releases/2012/04/120404144313.html

THE CONTRIBUTION OF PHOTOCHEMISTRY TO GREEN CHEMISTRY

Compiled by: **Mr. Abhishek Kumar,**
Lecturer, Department of Pharmaceutical Chemistry

At the beginning of the last century, Giacomo Ciamician, a professor of chemistry in Bologna, Italy, observed that the art of synthesis had reached an important target by making available various compounds identical to those of natural origin in the laboratory, yet it remained one step behind with respect to nature, in the sense that the use of a high temperature or of aggressive reagents was always required, whereas green plants appeared to be able to prepare the same compounds under mild conditions. To our knowledge, this is the first formulation of the concept of green chemistry. The next question was what gave plants this ability? Ciamician thought that, apart from the role of enzymes, the key was the fact that plants absorbed light from the sun. Therefore, he proceeded to test whether also in the laboratory one may exploit light for making (''green'') chemical reactions. This surmise resulted in a series of papers published over the first 15 years of the 20th century that lay the foundations of organic photochemistry. Thus, photochemistry and green chemistry have been closely connected since their birth, over a century ago, although both disciplines have been long forgotten, with synthetic photochemistry surfacing again after 1950 and green chemistry only in the last decade of the 21st century.

Nowadays photochemistry is usually considered among the environmentally advantageous methods for synthesis and the large number of reactions induced by light that have been characterized in the meantime offer useful synthetic paths. As briefly outlined below, a photochemical reaction does not ''automatically'' classify as ''green'', e.g., because a considerable amount of energy from non-renewable sources has to be supplied for the irradiation, unless solar irradiation for preparative reactions has been tested and found to be perfectly viable and susceptible to scaling up. The only problem is that the light flux changes with the weather conditions and thus the time required for reaction is variable. With handier artificial lamps, the environmental burden relative to the production of electric energy and its relatively inefficient conversion into light must be considered.

The key point, however, is that the only reagent used in photochemical reactions is light. No reagent is added, either stoichiometric or catalytic, making the atom economy of the process intrinsically better and discounting any trouble with the use of toxic, delicate or expensive additives as well as for the recovery of spent reagents.

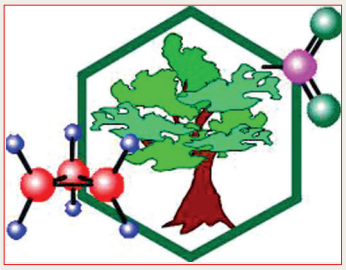
Photochemical reactions are not common in industry, and therefore the environmental aspect has been not considered in detail, since in most cases only small-scale explorative studies have been carried out. An important point that concerns the photochemical literature in general is that a large fraction of it is devoted to mechanistic studies. In many such studies no attempt to develop the preparative issue has been considered. This does not mean, however, that many such reactions are not suited for organic synthesis; it does mean that often one has to elaborate the experimental part to make it better suited for a synthetic application rather than using the method as reported in the literature.

Two important questions encountered when evaluating the suitability of a photochemical method for synthesis, and in particular for green synthesis are the choice of the lamp and that of the solvent.

Apart from the use of lasers, which may be advantageous in a suitably built apparatus, irradiation is usually done by means of a mercury arc. For dye-sensitized oxygenations, lamps emitting in the visible are used. High-pressure sodium arcs emit efficiently and can be used in an immersion well apparatus. However, the common ''quartz halogen'' lamps, for external use, are generally as convenient and much less expensive. For chain processes (radical halogenations, SRN1 arylation) a simple tungsten bulb is usually sufficient. Finally, an unparalleled opportunity with photochemical reactions of course is running them by using solar light. The amount of energy falling on the Earth in the form of solar light is tremendous, although the fraction absorbed by common organic molecules is small. The slow flux can be compensated for by using mirrors that achieve a ''moderate' concentration of the light flux.

The other important question concerns the solvent. The high molecular absorptivity of organic molecules makes it desirable to carry out irradiations in dilute solutions, typically 1 to 5×10^{-2}M or even less. This avoids complete absorption of light in the first layer, which would cause secondary photoreactions to occur in the first layers and/or leave unchanged the fraction of starting materials present in layers furthest from the light source. Indeed, to have a ''clean'' reaction, many explorative studies are carried out at d" 1×10^{-3}M concentration, implying that too large an amount of solvent must be used. An efficient recovery must thus be planned unless any ''green'' value of the process is lost.

In conclusion, to satisfy green chemistry criteria, photochemical syntheses as reported in the literature usually require further work, aimed at minimizing the use of electricity for the lamps and diminishing the amount of solvent involved.



Of course, it is important not only that light is produced as economically as possible but also that it is effectively absorbed. However, if industrial application is seriously considered, somewhat more expensive, but distinctly better performing irradiation apparatuses can be used. Likewise, the choice of the solvent should be reconsidered. It is usually possible to shift to less environmentally unfriendly solvents, e.g., from halogenated hydrocarbons to esters, with no substantial lowering of the yield. Furthermore, good results have been obtained in the solid phase. Thus, excellent results have been obtained by irradiating a suspension of nanocrystals in water. Another solvent-free choice that has been explored has the reagent embedded on polystyrene beads (for the case of photooxygenations). As mentioned above, attention to this point is growing, however, and better experimental set-ups can be bought or built. There is no reason why specific aspects, such as a large amount of solvent to recovery and the cost of the photon, cannot be improved.

References

1. Carreira E. M., Griesbeck A. G. (Eds.), Special Issue on Organic Photochemistry, **Synthesis**, 2001, 1111.
2. Roberto Ballini. Eco-Friendly Synthesis of Fine Chemicals.
3. Albini A, Fagnoni M. **Green Chem**, 2004, 6, 1.

Class Toppers 2010 -2011

Ms. Fathima Faiza
I B.Pharm

Ms. Ritika Iris Mary Mascarenhas
I B.Pharm

Ms. Meghana Rao
II. B.Pharm

Mr. Patel Rohan Kumar
III. B.Pharm

Ms. Shakila
IV. B. Pharm

NGSMIPS Students at Sports Tournaments

NGSMIPS Men's Volleyball Team with Mr. Rajaram Shetty, Physical Director at the Nitte Inter Collegiate Volleyball tournament on 7th February 2012

NGSMIPS Women's Throwball Team at the Nitte Inter Collegiate Throwball tournament on 7th February 2012

Cultural Day, March 10 2012

Book Post