AAiPS

Newsletter

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AMERICAN ASSOCIATION
OF INDIAN PHARMACEUTICAL SCIENTISTS
P.O. Box 7244
Colonia, NJ 07067

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INSIDE THIS ISSUE

PRESIDENT'S MESSAGE

Dear Friends,

Yet another year is passing by and it is time of the year to reflect on the goals and achievements of your organization. First of all, on behalf of AAiPS Executive Committee, I whole heartedly appreciate your support and patronage to this organization, which now I can confidently call "a mature professional organization of over 20-year standing" dedicated to Pharmaceutical sciences. Notable achievements of this year are (1) Establishment of India academic traveling scholarship with a value of around $4000. I appreciate Dr. Sam Singhvi and Dr. Punit Marathe who have worked out all details and made it happen this year. (2) Streamlining of AAiPS awards nomination and selection criteria to identify and reward appropriate leaders and scientists; this was spearheaded by Dr. Navnit Shah, Awards Committee Chair with the help of other EC members. (3) Streamlining of financial handling, investment strategy, and taxation by Dr. Suggy Chrai and Ramesh Raikar. (4) Planning of all AAiPS programs for 2007 by the Program Committee headed by Dr. Pramod Chemburkar and ably assisted by Punit Marathe, Chuck Bass, Bala Srinivas, Barry Fox, Vijai Kumar, and Dilip Wadgaonkar. (5) Improved and expanded newsletters for your reading pleasure put together by the main editor Dr. Hemant Joshi with substantial support by Dr. Pankaj Paranjpe. I also would like to recognize the sustained contribution of Dr. Bhargava, Professor Emeritus, Mass. College of Pharmacy, who has been heading the student scholarship awards committee for the last 10 years.

While we achieved many things, there is much more to achieve such as increasing our membership, which we could not achieve to the extent that I had targeted. We certainly will strive to do that in coming years. Once again, I appreciate your interest in the organization and without your support we can not make further progress. My sincere thanks to all sponsors, without their financial support and moral encouragement your association will not be where it is today. THANK YOU ALL!! I look forward to seeing you all in person at the annual Gala event in San Diego on Nov 14th. The whole AAiPS Executive Committee is eager to welcome you there.

Mike Yelvigi
President

QUOTE OF THE QUARTER

"If I have seen further than others, it is by standing upon the shoulders of giants."-Isaac Newton

Don't Miss This Event in San Diego
On Wednesday November 14, 2007

American Association of Indian Pharmaceutical Scientists (AAiPS) cordially invites you to join the AAiPS Annual Meeting

CHIEF GUEST: Dr. Victoria Hale,
Founder, CEO, Chair of the Board of Directors
Institute for One World Health

TIME:

RECEPTION	**5:45 PM**
KEYNOTE ADDRESS	**7:00 PM**
DINNER AND AWARDS	**7:45 PM**

PLACE: **Marriott, San Diego Hotel and Marina**

North Tower, Lobby Level

San Diego Ballroom A, B and C

REGISTRATION DETAILS

Register in advance at www.aaips.org

Specify food preference – Vegetarian/Non-vegetarian

Registration date	Members	Non-members	Students*
By October 30 with check	$40	$50	$25
Walk-ins	$45	$55	$25

*Students must include a copy of their student ID along with the check.
Checks payable to "AAiPS" send them to P.O Box # 7244, Colonia, NJ 07067

On Monday, November 12, you may register at the following booths:
Mendel Company- #2035; Aqualon- #1327

For information: Please call:
Punit Marathe 609-799-8159 (punit_marathe@yahoo.com)
Pankaj Paranjpe 203-232-4211 (paranjpe@gmail.com)

REGIONAL MEETING SEPTEMBER 20, 2007 UPDATE

Vijai Kumar

At the AAiPS regional meeting held on Sept 20, 2007 at the Cinnamon Indian Restaurant in Morris Plains, New Jersey, Dr Salah Ahmed, Executive Vice President, Global Research and Development of Barr laboratories was the invited speaker. The meeting was attended by about 70 members and non members. Mr. Vijai Kumar, AAiPS member-at-large welcomed the audience and Dr. Navnit Shah introduced the speaker. Dr. Salah Ahmed, a noted

Mike Yelvigi presenting AAiPS plaque to Dr. Salah Ahmed

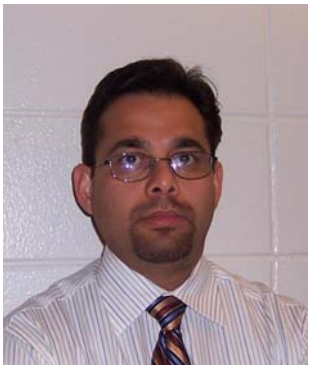
veteran of Generic Industry captured the audience with a lucid background on how the generic industry has grown in the past and is craving for new avenues of growth. He concentrated most of his talk on the emerging market scenario of Bio-Generics. He pointed out that Biogenerics is capital and cost intensive proposition and needs a well thought-out strategy for any company to succeed. He explained the various hurdles in getting a biogeneric to market. Biogenerics are biotechnology derived products which are supposed to be bio similar to Branded biotechnology products. He also mentioned that there are still many regulatory challenges and uncertainties regarding qualification of Biosimilar biologics.

Executive Committee members with Dr. Ahmed

There was a considerable discussion after his presentation. Mike Yelvigi, President of AAiPS presented an appreciation plaque to Dr. Ahmed for his presentation. The meeting ended with a nice Indian dinner.

CAREER CORNER
A CAREER IN DRUG DISCOVERY AND ADME-TOX PROFILING

Rajinder Bhardwaj, Ph.D.
Bristol-Myers Squibb Company



It is important for a graduate student who is interested in pursuing a career in the pharmaceutical industry to get exposed to as many fields as possible early in his educational training. Many universities and research institutes now support diverse educational programs at the graduate level that vary from basic molecular biology coursework to core studies in the pharmaceutical area. If a student takes advantage of diverse offerings, when an opportunity arises for him to hybridize between fields, he has the appropriate skill sets to succeed. The drug discovery and liability profiling areas in the pharmaceutical industry usually deal with *in vitro* assays on target receptors/signaling pathways or ADME properties that fundamentally require biotechnology and

pharmaceutical knowledge. A discovery scientist does not achieve the success of a drug directly, but rather gives useful information to discovery chemists and biologists in target working groups that should help in furthering drug development with less overall attrition.

For a drug molecule to reach the pharmacy shelf from a chemist's bench, it usually travels through four main stages, i) hit selection, ii) ADME-Tox profiling and specificity determinations iii) lead optimization (chemical) and iv) drug development, ending with clinical trials. To achieve this, modern drug discovery research requires crucial choices on the activities, tools and advancement criteria for each stage. Major pharmaceutical companies are investing large sums of money to increase the speed and efficiency in early discovery, so that better "hit" molecules can be identified at the earliest stage, which can then be taken all the way to better lead candidates, i.e. hit-to-lead. Hence, large pharmaceutical companies are primarily aiming at synthesizing more compounds, screening them faster, implementing rigorous testing during candidate selection, and doing all this at a reduced cost per compound and assay, so that compounds with poor properties do not advance to the development stage.

A drug discovery scientist screens large numbers of compounds for specific disease targets within a pharmaceutical drug discovery organization. The field covers a wide range of target classes, including kinases, proteases, nuclear receptors, and G protein-coupled receptors. The most common methods that are employed to perform these assays include radioligand binding assays, image analysis assays, enzyme fragment complementation, and bioluminescent and fluorescent-based assays. Once "hit" molecules are obtained through the drug discovery effort, then pharmaceutical ADME-Tox profiling assays and batteries of selectivity and specificity assays are applied to prioritize compounds for the development stage; this effort continues through medicinal chemistry rounds of compound optimization. The ADME-Tox profiling assays are utilized to guide chemistry decisions so that lead compounds can be selected for pharmaceutical optimization. The most common assays performed at the drug profiling stage are inhibition, structural integrity, solubility, pKa, protein binding, cytochrome P450 mediated metabolism and gastro-intestinal permeability. For the most part, in the pharmaceutical environment, traditional academic-style ADME assays are converted to medium to high-throughput formats so that i) quick decisions can be obtained from large numbers of compounds within short time-lines ii) good compounds can be selected for development based on profiling data as well as efficacy. Additionally, these assays can be applied individually or together to give a first-pass prediction of the performance of a new chemical entity in the human body.

From the drug discovery and profiling scientist's perspective, high-throughput screening at the early stage has the greatest potential to affect drug discovery in identifying the better active compound. Thus, the assays implemented in drug discovery and ADME-Tox profiling should be high throughput, conservative in sample use, and provide rapid measurement of compound properties. Modern drug discovery research requires the continual application of strategies to increase efficiency, implement new technologies and increase candidate quality. It is essential for a graduate student to be at the forefront of understanding new technologies and methods in high throughput analysis, as well as having a sound base knowledge of biology and the pharmaceutical sciences. Additionally, exposure to automation and its application in performing assays is an added advantage for a graduate student who is looking for a job in this area. Managing the data flow for thousands of compounds also presents a major challenge. Consequently, computer skills are also an important component and essential requirement for consideration as an ideal candidate. Fundamentally, the principle behind developing an assay does not change, whether the assay is carried out individually in an Eppendorf tube in an academic environment, or as part of a highly-integrated matrix team dealing with thousands of compounds in a large pharmaceutical company.

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CHANGES IN MEMBERSHIP RATES

After consideration and deliberations the Executive Committee approved the increase in the membership fee for the first time in the eighteen-year history of AAiPS. Effective January 2007, AAiPS life membership rates were increased to $300. Annual membership rates were increased to $35 and student membership to $20.

PEOPLE ON THE MOVE

Please send any "people of the move" announcements to Pankaj V Paranjpe at paranjpe@gmail.com for publication in the next newsletter.

PHARMA NEWS FROM INDIA

Compiled by Pankaj V. Paranjpe

Biocon Presents Positive Phase 1 Results for Oral Insulin

India's biotech major Biocon Ltd presented the results of phase I studies on its oral insulin product, IN-105 at the European Association for Study of Diabetes (EASD) meeting held at Amsterdam on September 21, 2007.

Phase I studies were conducted on healthy volunteers who have been administered IN-105 in the form of a tablet. The human clinical data on IN-105 was presented at the session on Novel therapies. Based on these promising results, the company intends to now develop this molecule through further clinical trials.

IN-105 is a novel analog of insulin, proprietary to the company. The product has special properties that make it feasible for delivery in tablet form stable at room temperature. The advantages of tablet delivery go beyond the obvious. Besides being needle-free insulin, this method of delivery allows IN-105 to be delivered into the body in a physiological manner that mimics the way that the pancreas release insulin into the circulation (i.e. into the portal vein). This contrasts with all the other known methods of delivery,

including inhaled insulin, which brings in insulin from the periphery into the circulation.

Indian Pharmaceutical Market to Hit USD 20 Billion by 2015: McKinsey Report

Spending on healthcare will continue to be robust in India and the domestic pharmaceuticals market will treple by 2015, according to a study. Spending on healthcare will witness the highest growth rate among all spending categories over the next two decades, a McKinsey & Company study has found. Healthcare grew from 4 per cent of average household income in 1995 to 7 per cent in 2005 and is expected to grow to 13 per cent by 2025, it said.

India's present pharmaceutical market was estimated at US$6.3 billion in 2005. It is expected to touch US$20 billion by 2015, with a compounded annual growth rate of 12.3 per cent, the study said.

Between 2000 and 2005, the pharma market witnessed a growth rate of 9 per cent.

Similarly, in terms of scale, Indian pharmaceutical market, which is ranked 14th in the world, would be among top 10 by 2015 in the world overtaking Brazil, Mexico, South Korea and Turkey, the study noted.

The incremental growth of US$14 billion over the next decade is likely to be the third largest among all markets.

Besides India, Japan, Canada and the UK are expected to add US$13-14 billion during the next decade. China would be next to the US with the Asian giant expected to add US $23 billion in the next decade.

Indian Drug Makers Eye Par Pharma

India's top drug makers are in the race to acquire U.S.-based generic drug maker, Par Pharmaceutical Co Inc.

Sun Pharmaceutical Industries, Ranbaxy Laboratories, Lupin Ltd and Wockhardt Ltd were named as potential bidders by the Times of India and the Economic Times. The Times of India, citing unidentified sources, said Ranbaxy and Dr Reddy's Laboratories had withdrawn from the race after showing initial interest in the U.S. generics firm, which is valued at about $700 million. The Economic Times said Ranbaxy may be the front runner. The spokeswoman for Dr Reddy's said the company was never interested in Par Pharma, while the spokesman for Ranbaxy declined comment. Lupin, Wockhardt and Sun Pharma also declined comment.

Sun Pharma announced in May that it had agreed to buy Israeli drug maker Taro for $454 million to help boost sales in markets such as the United States.

Compiled from: pharmabiz.com, Yahoo Finance. Reuters

BOOK REVIEW

Pankaj V. Paranjpe

The Ranbaxy Story-The Rise of an Indian Multinational by Bhupesh Bhandari
Published by Penguin Global, 2005.

Bhupesh Bhandari, author of this book, is an established business journalist from India. His sense of urgency flows through the text and makes for interesting reading for anyone with interest in Indian pharmaceutical business. True to his journalistic style, the book has a current feel to it and it unfolds the story of a major pharmaceutical company which had modest beginnings. I love the blurb which appears on the book jacket and I couldn't have written it better:

> "It took a sleeping pill a get a somnolent company up and running. The drug was Calmpose—Ranbaxy's answer to Roche's Valium—and its launch in 1969 was the hitherto unknown company's first step on the long road to global stardom."

The documentary –like style gets repetitive at times but makes for very informative reading on the whole. It is refreshing to see that finally taking cue from books like; The Legend of Pfizer or The Merck Druggernaut, authors are writing books like The Ranbaxy story.

DRUG DEVELOPMENT INDIA CONFERENCE

Cambridge Healthtech Institute is organizing a conference on planning and managing drug discovery and development activities in India. The conference will be held at the Park Hyatt in Philadelphia on November 15-16, 2007. More information at http://www.healthtech.com/2007/pci/

DR. R. S. BAICHWAL SEMINAR ON THERAPEUTIC PROTEINS: DEVELOPMENT AND DELIVERY CHALLENGES

The Seminar is planned in honor of Dr. R.S. Baichwal an alumnus of UICT, who has vast experience in the Pharmaceutical Industry and is well known for his contributions to Pharmaceutical Industry and Education. The Seminar has been instituted by AAiPS (American Association of Indian Pharmaceutical Scientists) at UICT.

Suggested topics:

1. Therapeutic proteins by rDNA techniques: Possibilities and problems: Dr. Punekar
2. Drug delivery Systems for biotech molecules: Barriers and Strategies: Dr. Amarjit
3. Immunological Considerations in delivery of peptides and proteins: Dr.Khole

AAiPS WEBSITE REDESIGN INITIATIVE

Pankaj V. Paranjpe

In the present era of information technology and internet the website of an association is essentially the primary mouthpiece of its activities, a connection to its members and audience and a one-stop shop for everything to know about that association. To better serve the needs of its members and to keep up with the advances in the field of web technology, www.aaips.org, the AAiPS website, is undergoing a major redesign. Some of the changes that the readers can expect to see on the newly redesigned website are better organization of information, quick access to upcoming and past events, access to past newsletters in pdf format and most importantly ability to pay your membership dues and regional meeting/annual meeting fees via an on-line credit card system. This initiative is an on-going project and we hope to go live with the new website by December 2007. The primary goal of the website is to serve you better. We will appreciate if you can provide us feedback in terms of what is lacking, where we need improvement and what else you would like to see on the AAiPS website in future. Please get in touch with me at paranjpe@gmail.com with your suggestions for the website.

ADVERTISEMENT RATES

The rates of advertisement for the AAiPS newsletter are as follows:

One year (four issues only): $1000 full page, $500 half a page, $250 quarter page

One time (one issue only): $400 full page, $200 half a page, $100 quarter page.

Contact: Mukund Yelvigi, President, AAiPS, myelvigi@hotmail.com or Dr. Hemant N. Joshi, hemantnjoshi@gmail.com.

No advertisements under a quarter page

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TECHNOLOGY UPDATE: MINIMALLY INVASIVE INJECTIONS: DREAM OR REALITY?

Rashmi Pai-Thakur

Ernest Mario, School of Pharmacy, Rutgers University, Piscataway 08854, NJ.
email:rthakur@eden.rutgers.edu

The popular oral route for delivery of APIs has been extensively investigated for decades as a route of administration for large molecular weight compounds and poorly absorbed molecules. These attempts have been largely unsuccessful and the delivery of these compounds especially the high molecular weight drugs through the oral route remains an illusion till date. The alternate route for these challenging entities has been the much painful intravenous or intramuscular route through injections.

This has resulted in exploration of other avenues such as nasal and transdermal routes for systemic delivery of these APIs. The latest and most promising in this regard are the microneedles which have been termed "painfree injections." Ranging from a few 100 μm to a mm in size, these needles are used to poke the skin to make microchannels into the skin. These microchannels coupled with drug reservoirs then act as delivery channels for the drug solutions. They are also used to extract fluids, such as blood, for measuring glucose and in ocular delivery.

Interestingly these needles are an inheritance from the electronics industry where they are manufactured with MEMS (Micro-Electro-Mechanical Systems) technology used to make integrated circuits. The painfree delivery from these needles comes from the fact that they are not long enough to stimulate nerves in the lower layers of the skin (at more than 700 μm deep) but are sufficiently long to penetrate the skin barrier posed by the uppermost layer of the skin, the stratum corneum (10-15 μm in thickness) without damaging it. Special attention has to be paid to the geometry and the length of the needles to render them painfree. Studies have shown that needles 600 μm in length do not penetrate beyond 300 μm in the skin due to the elasticity and resistance offered by the skin thus avoiding the nerves.

The needles can be solid made from silicon, titanium, plastic or glass and can be coated with drug which is delivered in the skin during the entry of the needle. The needles can also be hollow so that drug solution can be infused through these channels. Biodegradable polymer needles have also been fabricated and can be deposited into the skin to release drug over an extended period of time. A third and more recent approach consists of coating solid needles with polymer-drug plugs to provide sustained delivery by polymer deposition into the skin. The final patches comprise of arrays of needles ranging from 20 to 300 needles per patch within 1 sq cm. Experiments have shown that the drug can be delivered within a short span of 15 minutes into the skin from these arrays and is subsequently absorbed into systemic circulation.

Large molecular weight compounds such as desmopressin, ovalbumin, oligodeoxynucleotides, plasmid DNA, insulin, and erythropoietin have been delivered successfully by this approach. Interest in such devices has led to the commercialization of microneedles in the form of Alza's Macroflux® microprojection array which has titanium microneedles estimated between 50- 200 μm placed on a patch.

Companies actively investing in microneedle research include Alza Corp (California), Apogee Technologies (Boston), BD technologies (North Carolina), Sandia National Laboratories (New Mexico), BioValve Technologies (Massachusetts), Kumetrix (California), NanoPass (Israel), SpectRx and Therafuse (California) to name a few. The needles are also inviting attention from non-pharmaceutical firms such as Hewlett-Packard Co. Recent reports by Hewlett-Packard Co. mention that researchers have developed a medical patch that uses their thermal inkjet technology found in printers to make such microneedles. Additionally, these particular needles can be programmed to precisely control the amount and timing of each dose that is delivered. The patch incorporating this feature has been licensed by Crospon Ltd., Galway, Ireland, which plans to develop it into a commercial product. Equipped with basic electronics and a power source,

the microneedle patch measures 2.5 sq cm, and is 3 mm thick. Another promising study has shown that microneedle-based intradermal delivery of the Bacillus anthracis recombinant protective antigen (ANTHRAX) vaccine elicits an immune response equivalent to that of intramuscular injection (IM) at a relatively lower dosage.

Pain free delivery, ease of self administration by the patient, improved compliance, shorter delivery times with lower dosages seem to be the winning features of this technology. However, designing the needles into a complete delivery system convenient enough to be used by the patient himself has still not been achieved. The cost of manufacturing the needles might be a further hindrance to widespread acceptance of the technology. Adding to this is the complex issue of pain perception. Research studies indicate that adults on insulin don't always perceive pain during an injection. Unless researchers optimize the techniques for inserting microneedles into the skin to obtain reproducible delivery profiles and achieve the integration of needles into an economical and complete drug delivery system, the technique may find fewer takers as the transdermal delivery route did after the initial excitement in the 80's.

AAIPS Office Bearers for 2006-2008

President: *Mukund "Mike" Yelvigi*
Vice President: *Dilip Wadgoonkar*
Secretary: *Punit Marathe*
Treasurer: *Ramesh Raikar*
Immediate Past President: *Suggy Chrai*
Past President: *Sampat Singhvi*
Members-at-large: *Barry Fox, Vijai Kumar and Vinod Shah*
Metro DC Chapter Chair: Mehul Mehta

Various committees have been formed for 2006-2008:
Programming: *Pramod Chemburkar*
Newsletter: *Hemant Joshi –Editor, Pankaj Paranjpe – Asst. Editor*
Scientific: *Navnit Shah*
Sponsorship: *Bala Srinivas*
Membership: *Dilip Wadgaonkar*
Vision Committee : Chair - *Vinod Shah, Members - Krip Borah, Praful Sheth (FIP-India), Ajit Singh (AAC, India), Atul Mehta, Suggy Chrai, Ben Issac, Paul Likhari*
Finance Strategic Committee : Chair - *Suggy Chrai, Members - Bala Srinivas, Andy Honeycheck, Dilip Parikh, Ramesh Raikar.*
Awards Strategic Committee: Chair - *Sam Singhvi, Members - Nemi Jain, Dev Wadke, Yatindra Joshi, Vijai Kumar.*

PHARMACEUTICAL BLOGS

Pankaj V. Paranjpe

Dictionary.com defines a blog as "To write entries in, add material to, or maintain a weblog". Weblogs or blogs have had a tremendous rise in the past 4-5 years. Early on, they served as online journals or diaries for enthusiastic individuals with an interest but not necessarily a flair for writing. But over the past year or so, this form of writing has entered professional arena as well. Now, almost every newspaper of repute maintains a blog on their respective websites. Pharmaceutical writers and science writers are not lagging behind in this field. There are numerous pharma blogs which serve as good source for hot-off-the-press type of interesting and developing news stories. Here are a few which might interest you too:

- In The Pipeline: www.corante.com/pipeline
- Pharmalot: www.pharmalot.com
- The In Vivo Blog: http://invivoblog.blogspot.com
- Terra Sigillata: http://scienceblogs.com/terrasig
- OnPharma: http://pharmamanufacturing.wordpress.com
- Eye on FDA: http://www.eyeonfda.com/

DR. VINOD CHUNGI PASSED AWAY

One of our **Life members - Dr. Vinod Chungi** suddenly passed away on Saturday October 6, 2007 while in Mumbai on a business trip. Dr. Vinod Chungi was Vice President, **India Association of Greater Boston**, Burlington, MA. Vinod's wife Shoba Chungi is also member of AAiPS.