

## The NIDDK iNFORMER Newsletter - May 2011

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### Special points of interest:

Fellows' Retreat special reports:

- Career development sessions
- Keynote speakers
- Oral presentations

## Events Calendar

Tue May 10th | 4th Annual NIH Career Symposium

## Fellowship Office news

### NIDDK Internships

- The Federation of American Societies for Experimental Biology (FASEB) - Science and Technology Policy
- Extramural Review Branch
- Technology Transfer

Please click on the website below to get more details.

<http://fellowshipoffice.niddk.nih.gov/career/InternshipPrograms.shtml>

Applicants: email Kala Viswanathan at NIDDK Fellowship Office

### Bio Careers

Register today at BioCareer Center Jobs Board.

Over 1,400 listings for biomedical scientists in a variety of career paths.

[www.NIDDK.biocareers.com](http://www.NIDDK.biocareers.com)



NIDDK

The **iNFORMER**, is a monthly newsletter published by the Fellows Advisory Board (FAB) in collaboration with the NIDDK Fellowship Office. If you would like to participate in writing newsletter articles or have questions or comments, please contact any of the following members.

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## Keynote speakers focus on human health issues *by Michelle Bond*



**Retreat keynote speakers Dr Eric Chivian, Harvard Medical School (left) and Dr Marc Reitman, NIDDK Diabetes, Endocrinology & Obesity Branch (below).**

Fellows at the 6<sup>th</sup> Annual NIDDK Fellows Scientific Retreat sat with bated breath to hear what exactly Drs. Chivian (Harvard Medical School) and Reitman (NIDDK, NIH) were going to say on April 6<sup>th</sup> and 7<sup>th</sup>, 2011. Their talks, although disparate in several ways, coalesced around a central principle: human health depends on not only nutrition and genetics but also on external influences.

Dr. Eric Chivian addressed the fellows on Thursday afternoon using witty charm to capture the audience's attention. The understated Nobel Laureate insisted that our own health is intimately related to the health of the environment. His talk outlined several chapters of his recently published book "Sustaining Life: How Human Health Depends on BioDiversity" (Eric Chivian and Aaron Bernstein) and emphasized that loss of biodiversity equates to the loss of potential new medicines and treatments.

Using several case studies, Dr. Chivian offered a glimpse

of what may happen to our understanding and treatment of diseases if protecting the global environment does not become a priority. Particularly poignant were Dr. Chivian's descriptions of the plights of the polar bear (they are predicted to be extinct by the end of the century) and the cone snail (their natural habitats are dwindling). The medical value of these species may not be immediately obvious but cone snails are believed to have over 140,000 distinct toxins that are extremely potent, selective, and may be useful medicinally. And, it is medically remarkable that after 5-7 months of inactivity during hibernation polar bears do not have osteoporosis, kidney failure, or diabetes. With research on polar bears influencing at least three different conditions and the cone snail yielding a painkiller stronger than morphine, it is clear that protecting the environment is essential to preserve these species. As Dr. Chivian noted, cone snails and polar bears are "the face of extinction: these miraculous chemicals [and research opportunities] are gone forever" without them.

In the second keynote talk, Dr. Marc Reitman (a former Merck scientist) focused on another side of disease treatment: "Drug Discovery and Development: Lessons and Opportunities from Big Pharma." His talk on Friday afternoon focused on the health complications found in obese patients (diabetes, hypertension, heart disease, stroke) and the process of drug development to ameliorate them. The growing population of obese individuals in the United States (<http://www.cdc.gov/obesity/data/trends.html>) necessitates a foray into this ~12 year process for drug production. Dr. Reitman discussed the procedure for narrowing 1,000,000 compounds to ~1-3 before clinical trials. The selection of one compound for FDA

approval and manufacturing requires highly sophisticated equipment, excellent scientific minds, persistence, (sometimes) luck, and nearly \$1 billion. Despite successes in developing medicinal treatments, Dr. Reitman noted that public health intervention by prevention (sidewalks, gym every day at school, bike paths, etc.) is superior to disease treatment.

Translating the importance of environmental protection, disease prevention, and the complexity of drug design into clear, concise language, Drs. Chivian and Reitman provided a fascinating duo of seminars for the 150+ fellows attending the 2011 NIDDK Fellows Scientific Retreat. As Dr. Chivian observed, "when you look deeper into the natural world, everything gets more complex and [more] amazing." The keynote talks for the 2011 retreat underscored the importance of protecting the environment while doing excellent science on this "pale blue dot" that we call home.





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## Career development session—tech transfer & science policy *by Gaelle Lefevre*



Most of us started a graduate program/postdoc with a research career in mind. However, some may have realized along the way that, although still passionate about science, a career at the bench was not for them. For those who still want to deal with science daily and who enjoy writing, technology transfer or science policy may be attractive options, since both jobs require a broad scientific understanding and excellent communication skills.

But what are the jobs like? For us to get a chance to learn more about these two 'alternative' careers, a session was held at the recent fellows' retreat, bringing together two technology transfer specialists – Cindy Fuchs (NIDDK) and Jeffrey James (Johns Hopkins University) - and

three science policy experts – Jennifer Hobin and Anne Deschamps (FASEB), and Sandeep Dayal (NIDDK).

Technology transfer refers to the transfer of knowledge and skills from the lab to the public - be it the general population, or other research institutions and industries - in a process that ensures intellectual property protection. In the past, only companies were interested in patenting their inventions to generate benefits. But nowadays, most universities and governmental agencies, and an increasing number of non-profit organizations, also have a dedicated office to perform invention assessment, patenting, marketing, and licensing. Jeffrey James, a former NIDDK fellow

and current licensing associate at JHU, gave us a hint of what he does: he receives and reviews the invention, decides if it is appropriate for patenting, manages the patent prosecution with an attorney, writes the marketing material, and looks for potential enterprises to commercialize the invention. No need for a law degree, he said, but a broad scientific understanding and a good knowledge of patent law and process are required, along with good communication and interpersonal skills.

Science policy obviously also requires excellent communication skills, since it aims at counseling law makers on issues that are important to the scientific community (e.g. biomedical research funding, use of animals in research and education, biosecurity), or educating them on current scientific advancements that can impact general policies and/or societies (e.g. childhood obesity, diabetes). However, as pointed out by Jennifer Hobin, doing policy for science or science for policy is very different. She

and her colleagues at FASEB formulate research policies that promote scientific progress and thus, do not need to be as immersed into the science as Sandeep Dayal, a health science policy analyst at the NIDDK Office of Scientific Program and Policy Analysis, whose major function is to help the NIDDK Director report to Congress on the research supported by public funds. But in either case, if you consider a career in science policy, diplomacy and time management skills will be great assets.

Now, whichever of these career paths you consider, be aware that people work as a team to provide a service and as such, should not expect individual recognition for their work. But if you are fine with this, you will find many other satisfying aspects to these jobs. And if you are still hesitant, consider applying for a fellowship at the panelists' offices to gain some hands-on experience and find out if it is really for you!

## Oral presentations snapshot *by Sandra Loesgen*

### **Biophysics** - Nicolas Fawzi

Classic solution nuclear magnetic resonance (NMR) experiments can be used to structurally and kinetically characterize amyloid-beta polymerization. In the Laboratory of Chemical Physics, Nicolas Fawzi used the fact that the oligomeric state of this peptide involved in Alzheimer's disease is NMR-invisible. The oligomer in its 'dark' state is in equilibrium with NMR-detectable monomeric amyloid-beta. In solution NMR, only soluble analytes (e.g. a protein) are detectable - the 'dark' state of oligomeric amyloid-beta

cannot be characterized directly. Using NMR relaxation measurements, the kinetics of monomer-oligomer exchange were analyzed and interesting details like the oligo-formation rate of amyloid-beta, the off-rate, and the monomer-oligomer exchange could be revealed for the first time.

### **Biochemistry** - Quisheng Li

An insight into hepatitis C virus (HCV) host factor dependency was given by Quisheng Li from the Liver Disease Branch. Following up on an extensive

genome-wide screen for host factors interfering with HCV for productive infection and propagation, a comprehensive network map was presented with cellular pathways and machineries associated with the complete life cycle of HCV. Cellular regulatory networks were assessed by functional genomic studies with various in vitro model systems and HCV pseudoparticles. Seven novel HCV-specific entry factors and 15 common entry factors were identified. Functional studies showed 52 human genes are important for viral replication and

in total 78 host proteins are required for HCV traffic, assembly and particle release. This was a very interesting talk about HCV pathogenesis and their findings will guide further investigations towards a potential therapy.

### **Metabolic disease** - Mary DeMino

I have to admit, I am not an MD and graphical material of tissue or patients usually makes it hard for me to follow a talk. But...

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## Oral presentations cont.

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...Mary DeMino from the Liver Disease Branch was a great example how to guide a mixed-background audience through her research interest on nodular regenerative hyperplasia (NRH) and her findings on hepatic regeneration. NRH is a liver disease characterized by diffuse nodular formation in the tissue, but in the grand scheme this disease is not very well characterized. Using routine immunohistochemical stains on samples derived from the NIH

patient database showed unexpected results. Hepatic stem cells are activated, which suggests a new mechanism of regeneration in NRH, leading to new growth and thus nodular appearance. This theory was proved by double- and (newly developed) triple-stain immunohistochemistry. The results show that hepatic regeneration from stem cells may be responsible for the observed nodules seen in NRH and specific observed cell responses might be able to activate these stem cells. This regeneration mechanism can

be of potentially applied in other liver diseases.

### Developmental Biology - Lifeng Wang

The role of epigenetic regulation of Wnt genes involved in adipogenesis was presented by Lifeng Wang from the Diabetes, Endocrinology and Obesity branch. The Wnt/beta-catenin signaling pathway is known to inhibit adipogenesis while the role of the histone H3K27 methyltransferase Ezh2 in adipogenesis is still unclear.

Using a knock-out mice model and mutations of the Ezh2 protein revealed that Ezh2 directly represses Wnt genes to facilitate adipogenesis. Indications that acetylation and trimethylation on H3K27 are playing opposite roles in the regulation of Wnt expression were presented. Lifeng Wang gave a compact introduction on epigenetic regulation of adipogenesis by histone methylation and at the same time showed the complexity of developmental regulation in mammalian cells.

## Welcome New Fellows!



The following fellows joined NIDDK during the last month:

### Mauro Tiso

IRTA  
PhD, Cleveland Clinic/Cleveland State University  
Molecular Medicine Branch (Schechter group), Bldg 10

### Elisavet Serti

Visiting Fellow - Greece  
PhD, University of Athens  
Liver Diseases Branch (Rehermann group) Bldg 10

### Dmitry Yudkin

Visiting Fellow - Russia  
PhD, ICBFM (Institute of Chemical Biology and Fundamental Medicine) Russia  
Laboratory of Molecular and Cellular Biology (Usdin group), Bldg 8

### Alison Walters

Visiting Fellow- UK  
PhD, University of York, UK  
Laboratory of Molecular and Cellular Biology (Cohen-Fix group) Bldg 9

## Retreat travel award winners

Congratulations to the following fellows on winning travel awards for the best posters and oral presentations at the Fellows' Retreat (left to right):

David Sharlin— LBG, Jessica Keffer— LBC, Mawadda Al-Naeeli MMB, Su Hyung Park — LDB, Nina Peel-LBG (not pictured)



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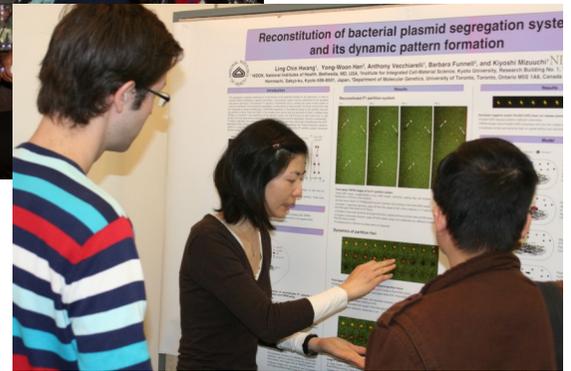
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**Thank you!**

to everyone who participated in the 2011 NIDDK Fellows' Retreat

