

# TechTIPS

Technology Transfer & Intellectual Property Services' newsletter for updates on licensing, patents, and other intellectual property matters.

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Issue No 14

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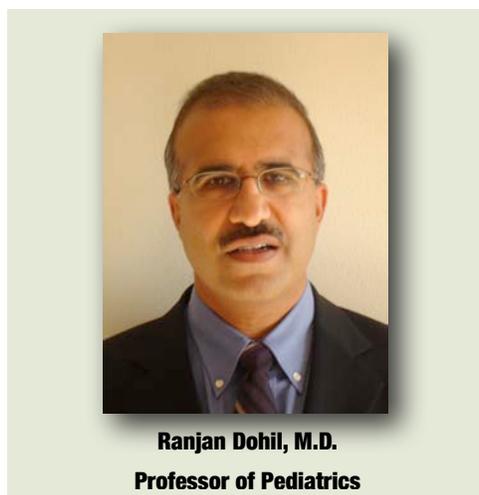
- 4/7/08: \$50K Competition Spring Kickoff and Executive Summary Awards
- 4/10/08: School of Medicine, Junior Faculty Program
- 5/5 - 5/8/08: BSSA 2008 Life Sciences Career Expo.

## Clinical Medicine and Orphan Drugs

UC San Diego Health Sciences has a stellar reputation for being at the forefront of cutting-edge research and clinical medicine. Frequently the focus is on more prevalent diseases like breast cancer, heart disease, and HIV, which afflict millions of people and attract millions of research dollars. But for the unfortunate few who have rarer diseases (or orphans as the FDA refers to them), there are folks hard-at-work, like Ranjan Dohil, who press forward to find novel solutions to treat orphan diseases like cystinosis and eosinophilic esophagitis.

In his clinical practice, one of the obstacles that Dr. Dohil encounters is patient compliance and tolerability of treatments because of adverse side-effects. Like his counterparts throughout the university, meeting his patients' needs led him to pursue new approaches.

Dr. Dohil is a pediatric gastroenterologist with an interest in acid-peptic disease. In collaboration with Dr. Jerry Schneider and with support from the Cystinosis Research Foundation, he began a series of small clinical trials which would help to understand possible causes of gastrointestinal symptoms in patients with cystinosis taking cysteamine, pharmacokinetics of cysteamine, and would ultimately lead to the development of a new cysteamine formulation. Dr. Dohil designed a naso-enteric tube that would allow delivery of drug into the stomach, small and large intestine. Data from this study allowed some understanding of how best to develop a new formulation of cysteamine, one that would



**Ranjan Dohil, M.D.**  
Professor of Pediatrics

require fewer daily administrations and would result in fewer symptoms. A preliminary formulation, EC-cysteamine, is currently being studied. Results so far have demonstrated that EC Cysteamine improved gastrointestinal tolerance and absorption. These improvements may lead to optimizing the drug dose thereby lowering the amount of drug needed, lowering the side-effects and increasing patient compliance. In addition, the new formulation may be useful for other metabolic and neurodegenerative diseases.

Cystinosis is a rare genetic disorder that affects over 2,000 people in the United States. While these numbers seem small in comparison to other diseases like cancer, the devastating effects include retinopathy/blindness, kidney failure and a shortened life, if left untreated. The disease symptoms are caused by an accumulation of the amino acid, cystine, in various organs of the body. In 1994, cysteamine - a cystine-depleting agent - was approved to treat cystinosis.

Cysteamine can deplete cystinotic cells of more than 90% of their cystine content leading to improved kidney function, especially if diagnosed early. However, a major drawback to cysteamine treatment is the gastrointestinal side-effects of nausea and vomiting. In the literature, the side-effects were colorfully attributed to its 'repulsive odor and taste'.

A Northern California firm recently acquired the license to Drs. Dohil and Schneider's cystinosis innovation to advance its march to commercialization. Dr. Dohil will continue as the lead clinical investigator for the ongoing cystinosis clinical trial.

Expanding upon his interest in acid related gastrointestinal disorders in children, Dr. Dohil used a similar approach to developing a treatment for eosinophilic esophagitis (EE), another orphan disease. EE is an inflammatory condition caused by a large number of eosinophils infiltrating the esophagus wall and it affects both adults and children, with an incidence rate of 1 in 10,000 children. Eosinophils are white blood cells or leukocytes that are normally triggered by allergic reactions. The resulting swelling of the esophagus wall causes difficulty in swallowing, vomiting, and overall failure to thrive in children, from lack of nutrition. The cause of EE is unknown, yet many patients have a history of hay fever, food allergy, and asthma. Current treatments include mechanical dilation of the esophagus and oral, topical, or inhalation steroid therapy.

With his colleagues at Children's Specialist of San Diego, Dr. Dohil began clinical studies for a different treatment for EE. This EE innovation has been licensed by a local San Diego startup company to pursue the compound's commercial development.

*(Continued on Page 2 - Dohil)*

## TechTIPS Staffer Goes to Sea: Learns First-hand the Effort Behind the Invention – by David Gibbons

On a sunny Friday morning at SIO's Marine Physical Lab in Point Loma, an SIO team, led by Professor Dave Checkley, was securing their instruments as I boarded the Research Vessel *Sproul* to join this 24-hour shake-down cruise off the coast of San Diego. We were going to perform some overnight testing of two instruments known as *Sounding Oceanographic Lagrangian Observer with a Laser-Optical Plankton Counters* (SOLOPC) to ensure their readiness, and the launch and recovery techniques for an upcoming month-long cruise. Professor Checkley had invited me to join this one-night cruise as an opportunity to see SIO research in action and gain an appreciation for the tough work that goes into an invention.

The SOLOPC is the result of a joint effort with researchers from Woods Hole Oceanographic Institution of Massachusetts and SIO. Their *laser optical plankton counter* (LOPC) is combined with Professor Checkley's widely used *Sounding Oceanographic Lagrangian Observer* (SOLO) floats to form the SOLOPC. The final device gives an autonomous instrument that measures particle abundance during descent to ~ 150m and temperature, salinity, and pressure during ascent to the surface. The data gathered provides insight into many factors relating to ocean health.

Being somewhat naïve about shipboard operations, I was initially amused by the extensive precautions employed by the team, as they tied and re-tied even the smallest piece of gear down to the boat. As I would learn however, the equipment and ship time are very expensive, over \$12,000 per day for the *Sproul*, and \$25,000 for each SOLOPC. Breaking something because you were too lazy to secure it is not an option.

Once underway, we participated in mandatory shipboard fire training, including each hand taking a turn on the fire hose and mustering for the abandon-ship drill. Although the entire crew had been to sea many times, these critical skills are mandatory practice, sending home the message that – despite the seagulls and sunshine – this was no casual sail on the bay.

Upon reaching the launch site, the entire team mustered on deck, complete with life jackets, hard-hats and steel toed boots to launch the first of the SOLOPC's. Although only 80 lbs in weight and easily thrown over the side, great care was taken in releasing each unit. At \$25,000 a piece, "throwing" them over the side was not an option the boss was going to hear from me. Once launched, the two units went to work for the night and would be recovered the following morning.



Professor David Checkley – SIO  
on board the *Sproul*

Despite bringing a good book to read, I soon learned that ship time was not something you squandered in bed. Once the SOLOPC's were clear of the boat, Professor Checkley quickly set about launching a super-fine funnel-shaped net for collecting copepods, plankton, larval shrimp, and fish. Using the substantial A-frame at the rear of the ship and capstan, we raised and lowered this mesh-net system numerous times between 100 and 300 feet of depth. After each test, the catch was transferred to a large specimen jar and preserved with formalin for later study at SIO. Again, as before, safety was paramount and I took the job of un-securing and re-securing the rear safety cables between each test as well as handling the guy-lines and netting as we swung the system back and forth over the stern of the ship. We continued collecting samples well past midnight and finished the night examining our catch under a microscope in the ship's lab area. I finally turned-in at almost 2 a.m. This was definitely a full day for me, but just another day for Professor Checkley and his team.

The next morning we were treated to a hearty breakfast and then set about recovering the two SOLOPC's that were launched the night before. Equal care was used in the recovery of the units, which were secured on deck without incident. The trip was a success, with the equipment working flawlessly and great insights learned about the potential issues in launching and recovering the SOLOPC's during the follow-on 30 day cruise.

As a desk-bound staffer at UCSD, I learned a great deal about the effort that our researchers expend in conducting their work. It was a great experience and I appreciate Professor Checkley's willingness to include me on his team. Now if we only had a group working on manned-space-flight...



## Dohil (continued from page 1)

Fortunately for these orphan diseases, they have champions in Dr. Dohil and his colleagues who pursue new treatments for their many patients. The use of the 'orphan drug' designation has been critical in helping clinical researchers develop new treatments for rare diseases. In 1983, the Orphan Drug Act was passed by the US Legislature and administered by the Food and Drug Administration to encourage companies to develop treatments for rare diseases. Under this legislation, orphan diseases are defined as diseases affecting fewer than 200,000 people in the United States. Since research and development costs for these orphan drugs can be prohibitively expensive, orphan drug designation allows companies special tax incentives and extended marketing exclusivity.

Since the Orphan Drug Act passed, over 300 orphan drugs and biological products have benefited from this initial designation and brought to market. This group includes: cetuximab (Erbbitux®), Velcade®, Bexxar®, Gleevec®, erythropoietin (Epogen®), and rituximab (Rituxan®).

Ranjan Dohil, MD is a clinician-researcher with UC San Diego Medical Center and Rady Children's Hospital San Diego. He specializes in pediatric gastroenterology, hepatology, and nutrition. Dr. Dohil received his medical degree from the University of Wales College of Medicine, Cardiff, United Kingdom, and continued his training at British Columbia's Children's Hospital in Canada. He has been a professor in the School of Medicine, Department of Pediatrics since November 1998.

## Events • Seminars • Meetings

March 18, 2008: CONNECT Workshop on Market Traction. More info at <http://www.connect.org/programs/rta/index.htm>

March 19, 2008: TechTIPS Innovators Roundtable Presentations by physical science faculty.

March 20, 2008: Genomic Advances on a Grand Scale Presenter: Dr. J. Craig Venter at UCSD Skaggs School of Pharmacy and Pharmaceutical Science. More info at: <http://calendar.ucsd.edu/DisplayEventDetail.asp?EventID=19124&iSubCatID=3&iRoomID=>

April 7, 2008: \$50K Competition Spring Kickoff and Executive Summary Awards. More info at <http://50k.ucsd.edu/>

April 10, 2008: School of Medicine, Junior Faculty Development Program, Workshop on Intellectual Property. TechTIPS to present.

May 5 – May 8, 2008: 2008 Life Sciences Career Expo, organized by the Biological Sciences Student Association. TechTIPS to participate on panel. More info at: <http://bssa.ucsd.edu/>.



## Division of Biological Sciences

Xuong Nguyen-Huu et al. – 7,262,411: Direct collection transmission electron microscopy

Martin F. Yanofsky et al. – 7,273,968: Combinations of genes for producing seed plants exhibiting modulated reproductive development

Charles S. Zuker – 7,335,479: Assays for sensory modulators using a sensory cell specific G-protein alpha subunit

Charles S. Zuker et al. – 7,244,584: T2R, a novel family of taste receptors

Charles S. Zuker et al. – 7,270,967: Nucleic acids encoding a G-protein coupled receptor involved in sensory transduction

Charles S. Zuker et al. – 7,282,557: Nucleic acids encoding a G-protein coupled receptor involved in sensory transduction

## Division of Physical Sciences

Edward A. Dennis et al. – 7,294,496: Cloned human lysophospholipase

Trevor C. McMorris et al. – 7,329,759: Illudin analogs useful as antitumor agents

Emmanuel A. Theodorakis et al. – 7,288,671: Interleukin-1 and tumor necrosis factor- $\alpha$  modulators, synthesis of said modulators and their enantiomers and methods of using said modulators



## Jacobs School of Engineering

Sangeeta Bhatia et al. – 7,312,046: Method of screening compounds using a nanoporous silicon support containing macrowells for cells

David A. Gough et al. – 7,248,912: Tissue implantable sensors for measurement of blood solutes

David A. Gough et al. – 7,336,984: Membrane and electrode structure for implantable sensor

Philip M. Papadopoulos – 3,287,775: "ROCKS" Registered Trademark

Philip M. Papadopoulos – 3,285,401: "ROCKS" Registered Trademark

Paul H. Siegel et al. – 7,284,186: Parity check outer code and runlength constrained outer code usable with parity bits

## School of Medicine

Eliezer Masliah et al. – 7,276,643: Transgenic animals, cell lines derived therefrom, and methods for screening for anti-amyloidogenic agents

Fred Levine et al. – 7,276,352: Induction of  $\beta$  cell differentiation in human cells by stimulation of the GLP-1 receptor

Joseph A. DiDonato et al. – 7,314,615: I $\kappa$ B Kinase- $\beta$  (IKK $\beta$ ) binding antibodies and methods of using same

Lawrence SB Goldstein et al. – 7,276,331: Plus end-directed microtubule motor required for chromosome congression

Mark H. Tuszynski – 7,244,423: Methods for therapy of neurodegenerative disease of the brain

Michael Karin et al. – 7,319,134: Regulation of transcription factor, NF-IL6/LAP

Richard S. Kornbluth – 7,300,774: Multimeric fusion proteins of the TNF superfamily ligands

Richard S. Kornbluth – 7,332,298: Nucleic acids encoding multimeric proteins of TNF superfamily ligands



Robert R. Myers et al. – 7,300,915: Use of erythropoietin and erythropoietin mimetics for the treatment of neuropathic pain

Roger Y. Tsien – 7,332,598: Non-oligomerizing tandem fluorescent proteins

Roger Y. Tsien et al. – 7,329,735: Fluorescent protein variants and methods for making same

Salvatore Albani et al. – 7,301,005: Immunomodulatory peptides derived from heat shock proteins and uses thereof

Sanjay K. Nigam et al. – 7,326,570: Induction of tubular morphogenesis using pleiotrophin

Virgil L Woods – 7,280,923: Methods for crystallographic structure determination employing hydrogen exchange analysis

## Scripps Institution of Oceanography

Richard W. Johnson – 7,327,513: Method and apparatus for viewing target

## Other

Jacqueline A. Carr – 3,290,642: "LOCAL INNOVATION. GLOBAL REACH." Registered Trademark

Jaime A. Pineda – 7,269,455: Method and system for predicting and preventing seizures

*These US patents and trademarks were issued from 7/1/2007 to 3/4/2008. Some patents may have more than one assignee and/or pending assignee determination.*



## Technology Trends from the Trenches

UCSD TechTIPS has averaged over 70 licenses in recent fiscal years. These licenses cover a wide range from pharmaceuticals to explosive sensors to wireless technologies. The types of innovations licensed may be an indicator of trends in the technology sectors. The following is a sampling of technologies that were licensed since the start of FY2008:

- Video to Text Correspondence – SciVee™
- Disclosure of code (ActionScript) developed for FaceFX
- Equivalence Ratio Oscillation Sensor
- G-Protein Coupled Receptor Functions of the Presenilins in Alzheimer's Disease and Memory
- Enterically Coated Cysteamine
- Texty: A Natural Scene Text Reader
- Digital Analysis of Gene Expression
- Sidewall Tracing Nanoprobes, Method for Making the Same, and Method for Use
- Hybridoma Cell Lines Expressing Monoclonal Antibodies to Human MD-2
- Source-dependent Color Space and Anisotropic Multi-scale Morphological Filters for Dichromatic Image Processing
- Online Game for Collecting Music Annotations
- Disclosure of code (C/C++ desktop application) developed for FaceFX
- Spinal multisegmental cell and drug delivery system
- Portable, Multi-infusion Pump for Emergency Medical Treatment
- CalRadio Radio Transceiver Development Platform
- A New Method to Reduce Mortality in Septic Shock
- A Method to Treat Autoimmune Disease by Therapeutic Antibody
- Peripherally Active Hyperalgesic Opiates
- Peripherally Active Anti-hyperalgesic Agents
- Methods and Means for Delaying Seed Shattering in Brassicaceae
- Visual Media Group Library; MDTV, TCOYD, People & Pets and various
- Catalog of Clinical Images (<http://medicine.ucsd.edu/clinicalimg>)
- Rocks®
- Human Glucuronidation in Mice
- CG4, A Permanent Cell Line of Rat Brain Oligodendrocyte-Type-2 Astrocyte Precursors
- HESA: Hepatic Encephalopathy Scoring Algorithm
- WALRUS Sample Gallery Images
- HDDEraser 2.0 Beta
- Substance Alcohol Feedback and Education Survey
- Coralreef and Related Modules - CVS Tree (software)
- Pathogenesis and Early Diagnosis of Multiple System Atrophy (MSA)
- Practical Guide To Clinical Medicine
- Por La Vida Cuidándose: La Mujer y el Cáncer Por La Vida Cuidándose: Women and Cancer
- Video-based Car Surveillance: License Plate, Make, and Model Recognition
- Pulse Sequence for Spiral and Echo-planar Imaging (SPEP) with Arterial Spin Labeling Preparation Module

UCSD has over 1400 available innovations in its technology portfolio. For a listing of these technologies, please visit our website at: <http://invent.ucsd.edu/technology/index.htm>

## R E L A T E D N E W S

### Gates Foundation to Fund Innovative Global Health Research

The Bill & Melinda Gates Foundation recently announced that beginning March 31, 2008, it will accept grant proposals for the first funding round of Grand Challenges Explorations, a new \$100 million initiative to help scientists across the globe pursue ideas that have never before been tested for solving major health problems. The four topics for the first funding round are Tuberculosis, HIV, infectious diseases, and drug resistance.

Initial grants through the Explorations initiative will be \$100,000 each, and projects showing success will have the opportunity to receive additional funding of \$1 million or more. The initiative will use an agile, accelerated grant-making process—applications will be two pages, and preliminary data are not required. The foundation will select and award grants within ap-

proximately three months from the proposal submission deadline of May 30, 2008.

The foundation's new Grand Challenges Explorations program plans to give \$100,000 each to about 60 projects in the first round of what is expected to be a five-year program.

Grant proposals for the first Explorations funding round will be accepted online at Grand Challenges Explorations from March 31 through May 30, 2008; applicants must register intent to submit a proposal by May 15, 2008.

Once the first Explorations funding round is complete, the foundation will announce subsequent funding rounds. Topics may vary over time, to cover a range of priorities in global health research.

Full descriptions of the initial topic areas and application instructions are available at [www.gcgh.org/explorations](http://www.gcgh.org/explorations).



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