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Singapore's Burgeoning Biomedical Research Scene Presents Opportunities for ECP

When professor **Pamala Jacobson** received an invitation from Singapore General Hospital to share her expertise in pharmacogenomics by teaching a ten-day course for its clinical pharmacists and interns in August, a larger opportunity for the ECP department quickly became apparent. The trip was a chance to cultivate a new global connection not only with Singapore's flagship hospital and key health institutions, but also the National University of Singapore (NUS), with which the hospital is affiliated.

In the last two decades, Singapore's government has made a significant investment in biomedical sciences, partnering with a number of U.S. hospitals, research centers, and higher learning institutions in a concerted effort to create a highly knowledge-driven economy. Public-sector initiatives have lately focused on strengthening Singapore's capabilities for innovative clinical and translational research.

Using pharmacogenomics to improve patient care is currently generating much interest in Singapore. This springs from a recent look by the country's Health Sciences Authority (HSA) into carbamazepine, prescribed to treat epilepsy and nerve-related disorders, and the high incidence of Stevens-Johnson syndrome and toxic epidermal necrolysis in the Singapore population.

HSA noted that a genetic variation common in the ethnic groups that comprise much of the Singapore population, HLA-B*1502, had been linked to the potentially fatal reactions to the drug.



Top: Singapore General Hospital. (Photo: Wikipedia) Above: Pamala Jacobson (left) receiving honors for her keynote presentation at the 23rd Singapore Pharmacy Congress. (Photo: Robert Straka)

DEPARTMENT OF EXPERIMENTAL AND CLINICAL PHARMACOLOGY

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from the DEPARTMENT HEAD

Dear Friends:

We recently concluded another strong year for our department, and as always, I am honored to share with you some of the accomplishments of ECP faculty, students, and staff in the pages of this newsletter.

Our department contains a richness of interests and specialties, which contributes to a broad research portfolio. In the last year, our faculty received new grants to conduct research in areas as diverse as tobacco dependence, Alzheimer's Disease, and decision-making by clinical pharmacists and nurses. Other ECP faculty are continuing funded work in pharmacogenomics in cancer and transplants, the cognitive effects of drugs, and infection prevention, to name just a few projects.

This fall, the College launched a new Pharm.D. curriculum for the Class of 2017 and beyond. ECP faculty have spent many hours alongside their colleagues from other departments in the College to design a program that prepares pharmacists for the rigorous, collaborative, and expanding role they serve in today's health care environment. Classes incorporate active learning techniques, such as group work and cooperative learning, and technologies that support interactive lecturing. I am excited to see how this approach allows our professional students' scientific skills and curiosity to thrive.

Meanwhile, our department continues to provide excellent training for tomorrow's experimental and clinical pharmacologists in our doctoral graduate program, now led by Director of Graduate Studies Angela Birnbaum, Ph.D., and Associate Director of Graduate Studies Marnie Peterson, Pharm.D., Ph.D. In 2013, ECP students garnered multiple awards and recognition for their research.

Additionally, in the past year, members of ECP have been actively developing international relationships that enhance the department and the College of Pharmacy. Global connections can potentially inform investigations and inspire new research collaborations, and certainly promote the presence of the University around the world.

Thank you for your interest in ECP. You have my warmest wishes for continued success and productivity in 2014.

Robert J. Straka, Pharm.D., Professor and Department Head



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Singapore Presents Opportunities for ECP

Because of this discovery, in April Singapore's ministry of health issued a new standard of care: before prescribing carbamazepine to new patients of Asian ancestry, doctors should have them tested for the allele. HSA strengthened package inserts for carbamazepine, adding information about the association between the allele and the deadly reactions.

Singapore General wanted to prepare the hospital's pharmacists and interns for the clinical implementation of pharmacogenomics, such as this new standard of care—and they reached out to Dr. Jacobson.

"They wanted a broad course that covered general concepts of pharmacogenomics, adverse drug reactions, anti-coagulation, immune suppression, cancer, and cardiovascular disease," says Dr. Jacobson, "so I looked to the department for expertise."

Specifically, she turned to ECP department head Robert Straka, whose research focus is cardiovascular pharmacogenomics. While in Singapore, he could also meet with NUS faculty and administrators to pursue an important ECP objective of expanding global interactions for teaching, research, and collaboration.

A full itinerary of meetings, tours, and research discussions with clinical

pharmacists, physicians, NUS faculty, and hospital personnel rapidly fell into place. In addition to teaching the course for the hospital pharmacists and meeting with physicians to promote pharmacogenomics, Dr. Jacobson was invited to give the keynote presentation at the 23rd Singapore Pharmacy Congress, organized by the Pharmaceutical Society of Singapore. Dr. Straka was invited to speak at the Cardiovascular Research Institute, housed in the Yoo Loo Lin School of Medicine at NUS.

Potential Collaborations

For its part, NUS was delighted at the opportunity to have Dr. Straka as an academic visitor. Having just launched a Pharm.D. program in 2009, its pharmacy faculty in particular were eager to discuss shared research interests and their plans for building the program.

Dr. Straka says he is optimistic about the potential for collaborations with faculty within NUS. "Their professional program is small and new—just graduating its first Pharm.D. class," he says, "but they want to build their department's expertise in areas similar to ours."

As one of several ECP faculty researchers interested in pharmacogenomics, he is also intrigued by the possibility of research collaborations with other investigators interested in the utility of pharmacogenomics-guided drug therapy in a uniquely diverse population. "Ultimately, engagement with

our colleagues across the globe advances our common interests to optimize the selection and use of medications for patients with common conditions," says Dr. Straka. "Partnering with investigators at NUS and SGH could provide access to well-characterized populations not found in Minnesota." To that end, Dr. Straka is currently working with the University of Minnesota's Global Programs Steering Committee to develop a memorandum of understanding with NUS that would establish ECP faculty exchanges focused on research—and possibly graduate student exchanges, as well.

In addition to meeting with members of NUS and Singapore General Hospital during the visit, Dr. Straka was able to meet with representatives of Singapore's lead public R&D agency, the Agency for Science, Technology, and Research (A*STAR). As well as overseeing its own many research institutes and centers, A*STAR aids international investigators in establishing research programs in Singapore and provides scholarships for promising Singaporean students to pursue scientific training, both locally and abroad. Dr. Straka says his interactions with these administrators gave him a unique view of how another country has successfully developed research collaborations between industry and academia.



SPOTLIGHT: Dr. Jeannine Conway

Each week, Dr. Jeannine Conway consults with the physicians at the Comprehensive Epilepsy Center at the University of Minnesota to help solve the medication issues of the clinic's adult patients. During the summer, she also serves as the pharmacist for Camp Oz, a camping experience organized by the Epilepsy Foundation of Minnesota for kids with seizures. But besides neuropharmacology and epilepsy, Dr. Conway lists among her research interests the development of expertise, clinical thinking, and pharmacy education—not surprising, given her role as the director of applied education for the College of Pharmacy's professional program.

In her position, Dr. Conway coordinates applied learning in the curriculum, as well as the specific learning activities of the Pharmaceutical Care Learning Center (PCLC), and directs operations for PCLC on both campuses.

“My ongoing clinical service with the epilepsy clinic allows me to practice thinking like a pharmacist, which informs how I design learning activities for students,” she says. In her learning lab, she assesses how well an activity meets its learning objective by observing student performance. Performance data can show her where additional research is required in order to help students learn to think like pharmacists.

Student accolades show that her methods make an impact. In the last year, she was voted Teacher of the 2012 Fall Semester by the Class of 2014, Teacher of the Year by the Class of 2013, and Teacher of the 2013 Fall Semester by the Class of 2015.

To pursue further research in the development of decision-making, Dr. Conway was recently awarded a \$31,605 University of Minnesota Grant-in-Aid of Research, Artistry and Scholarship for her project, “Pharmacist and Nurse Clinical Decision-Making: An Initial Exploration of Shared Decision-Making Processes.” Another opportunity for Dr. Conway's research in this area came in June, when she was named a 2013-2014 Faculty Scholar in the National Association of Chain Drug Stores Foundation's Community Pharmacy Faculty Scholars Program. As a scholar in the program, she'll be connected to experts in the fields of community pharmacy and research and will receive support to design, conduct, and evaluate a research project in community pharmacy practice.

Recent Activities

Grants

Jeannine Conway was the recipient of a \$31,605 University of Minnesota Grant-in-Aid of Research, Artistry and Scholarship for her project “Pharmacist and Nurse Clinical Decision Making: An Initial Exploration of Shared Decision-Making Processes.”

Michael Kotlyar received a \$110,628 grant from ClearWay Minnesota for his study “Smoker Response to the Banning of Menthol-Flavored Cigarettes.”

In June, **Dr. Kotlyar** also received a \$200,000 grant through the Global Research Awards for Nicotine Dependence Awards program, supported by Pfizer, for his study “Use of Medicinal Nicotine for Preventing Cue-Induced Craving and Withdrawal Symptoms.”

Robert Kriel, Jim Cloyd, and Linda Krach received funding from the Paralyzed Veterans of America and from Medtronic Foundation in support of the project “Prevention of Baclofen Withdrawal Syndrome: Two-Way Crossover Study of Oral and Intravenous Baclofen in Healthy Adult Volunteers.”

Vishal Lamba is part of a five-year U01 grant awarded by the National Heart, Lung, and Blood Institute to the Vascular Biology Center, “Cannabinoid-Based Therapy and Approaches to Quantify Pain in Sickle Cell Disease” (PI: Kalpana Gupta). He joins University of Minnesota investigators in the Department of Medicine, Dental School, and Division of Biostatistics. Dr. Lamba will be involved in genomic and translational components of the \$9.1 million project.

Ling Li was the recipient of a \$35,886 University of Minnesota Grant-in-Aid of Research, Artistry and Scholarship for her purchase a tabletop ultracentrifuge.

For her project “ApoJ/Clusterin Peptide as a Novel Therapeutic Agent for Alzheimer’s Disease,” **Dr. Li** has received a two-year, \$200,000 grant from the Alzheimer’s Drug Discovery Foundation.

In October, **Dr. Li** also received a \$23,000 Engebretson/Bighley Drug Design & Development Grant for her project “Therapeutic Potential of a Novel Neuroprotective Agent for Alzheimer’s Disease.”

Susan Marino was awarded a two-year, \$264,617 grant from Bristol-Myers Squibb for her study “Cognitive and Motor Effects of Treatment with a Tacrolimus vs Belatacept-based Immunosuppression Regimen in Kidney Transplant Recipients: A Substudy of the BEST Trial (BEST-COG).”

Marnie Peterson received a grant from the 2013 CTSI-Ed R-to-R Scholars Program, a pilot bridge funding mechanism to help University investigators expand and enhance their research programs.

Honors and Elections

Jim Cloyd has been appointed to the FDA’s Pharmaceutical Science and Clinical Pharmacology Advisory Committee. The committee provides advice to the Commissioner of Food and Drugs on scientific and technical issues concerning the safety and effectiveness of drug products for use in the treatment of a broad spectrum of human diseases, among other responsibilities. Dr. Cloyd’s four-year term began on November 1.

Jeannine Conway has been appointed to the Psychiatric



Above: ECP adjunct associate professor Ramaiah Muthyala at the Pharmaceutical Export Council of India in September.

Pharmacy Specialty Council of the Board of Pharmacy Specialties for the 2014-2016 term.

Jeannine Conway was elected secretary of the Laboratory Instructors Special Interest Group (SIG) of the American Association of Colleges of Pharmacy (AACP). The mission of the Laboratory Instructors SIG is to improve laboratory course content by providing direction for laboratory courses in professional pharmacy curricula.

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The College of Pharmacy's Class of 2013 selected **Jean-nine Conway** as the Teacher of the Year (Twin Cities) for the 2012-2013 academic year.

The NACDS Foundation named **Jeannine Conway** as a 2013-2014 Faculty Scholar. The program mentors junior faculty at schools and colleges of pharmacy across the U.S. through the design, conduct and evaluation of meaningful community pharmacy-based patient care research. The initiative also seeks to connect the participating scholars with experts in the fields of community pharmacy and research.

Pamala Jacobson was made a Fellow of the American College of Clinical Pharmacy. Fellowship recognizes excellence

in the practice and science of clinical pharmacy, and is awarded to individuals who have made sustained contributions to ACCP and who have demonstrated exceptional performance in clinical pharmacy practice and/or research. Fellows may be recognized by the initials "FCCP" as a part of their title.

Pamala Jacobson received the Outstanding Advisor Award sponsored by the University's Student Conflict Resolution Center working with the Graduate and Professional Student Assembly (GAPSA). The award, which is University-wide, recognizes advisors who go out of their way to create a positive learning environment. Dr. Jacobson was one of only five recipients; nominations come directly

from students. She was presented with the honor at GAPSA's Annual President's Reception on November 4.

Ramaiah Muthyala was chosen to be a member of the International Rare Diseases Research Consortium (IRDiRC) Working Group on Chemically-Derived Orphan Products including Repurposing. The IRDiRC was launched in 2011 with the European Commission and the U.S. National Institute of Health as founding institutions.

Marnie Peterson won a 2013 CTSI Poster Session Travel Award for her project "Efficacy of Antibiotics Against *Staphylococcus aureus* Biofilm is Enhanced by Neutralization of Alpha-Toxin." Her co-investigators were ECP adjunct faculty member **Michele Anderson** and James R. Johnson. Winners received \$1500 in travel funds to present their CTSI-sponsored research at a national meeting of their choice.

Debra Skaar was awarded Fellowship in the American College of Critical Care Medicine (ACCM). Fellowship is meant to recognize individuals who have demonstrated significant contributions and have made an impact on the profession at a regional, state, or national level. Fellows may

be recognized by the initials "FCCM" as a part of their title.

Media

Angela Birnbaum's work on the NIH grant "Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs" was featured on KSTP-TV on April 14, 2013 ("U of M Part of National Study on Epilepsy and Pregnancy").

The Center for Orphan Drug Research, directed by **Jim Cloyd**, was featured in WCCO-TV's story "Kids Battling Rare Diseases Enjoy 'Normal' Day at Nickelodeon Universe" (February 28, 2013).

Jim Cloyd commented for the Pharmabiz article "US FDA Grants Orphan Drug Status to Ligand's Captisol-Enabled Topiramate Injection" (July 30, 2013).

Ilo Leppik was quoted in the *StarTribune's* August 12 story "Gophers Coach Jerry Kill Tackles Epilepsy at Pivotal Point in Career." Dr. Leppik's important role as Kill's epilepsy doctor is described in the story.

Len Lichtblau commented for KARE-TV's October 15 story "Popular Bodybuilding Supplement is Pulled," about a pre-workout powder that contains amphetamine-like compounds.



Presentations

Jim Cloyd presented “The Role of Academic Institutions in the Development and Commercialization of Orphan Drugs” as part of the Ohio State University College of Pharmacy’s Distinguished Lecturer Series on October 4.

Jeannine Conway co-presented “A Tale of Two (or More) Campuses: Challenges of Practice Skills Education in Multi-Campus Programs” with Angela George for the Laboratory Instructors SIG at the 2013 AACP Annual Meeting in Chicago in July.

Also at the 2013 AACP Annual Meeting, **Jatinder Lamba** presented “Technological and Educational Resources that Drive Modern Clinical PGx” for the Pharmacogenomix SIG.

Ling Li was an invited speaker and chair for the session on Lipids in Neurodegenerative Diseases at the International Society of Neurochemistry/American Society of Neurochemistry Satellite Symposium, “Unveiling the Significance of Lipid Signaling in Neurodegeneration and Neuroprotection,” which was held April 17-19, 2013, in Cancun, Mexico.

Dr. Li hosted the opening ceremony for the BIT’s 4th Annual World Congress of

NeuroTalk-2013 (May 23-25, 2013, in Xi’an, China), and was the moderator for the Keynote Forum (Plenary Session). Dr. Li was also an invited speaker and the co-chair for the session “Disorders of the Nervous System: Basic Mechanisms and Therapy.”

Ramaiah Muthyala gave the Keynote Lecture at the 9th Annual General Body Meeting of the Pharmaceutical Export Council of India on September 25 in Hyderabad, India. This meeting focused on overseas marketing strategies, opportunities for orphan drugs, and intellectual property rights matters. Dr. Muthyala’s presentation was titled “Global Government Policies and Opportunities in Development/Manufacture of Orphan Drugs.”

Dr. Muthyala served on the program committee for BIT’s 11th Annual Congress of International Drug Discovery Science & Technology 2013 (November 11-16, 2013, in Haikou, China). He chaired the session “Advances in Drug Repositioning R&D,” and also presented a lecture, “Orphan Drug Development through Repositioning.”

At the 2013 AACP Annual Meeting in Chicago in July, **Robert Straka** presented a special session, “Development

of a Graduate-Level Cross-Institutional Course to Foster an Understanding of Translational Sciences,” about ECP’s work with UNC-Chapel Hill and the University of Pittsburgh to develop a shared, synchronous readings course.

Promotions

Pamala Jacobson was promoted from associate professor (with tenure) to professor (with tenure).

Debra Skaar was promoted from assistant professor (non-tenure) to associate professor (non-tenure).

Publications

Jatinder Lamba was corresponding author of the paper “Clinical Significance of CD33 Nonsynonymous Single-Nucleotide Polymorphisms in Pediatric Patients with Acute Myeloid Leukemia Treated with Gemtuzumab-Ozogamicin-Containing Chemotherapy,” which appeared in the March 15 issue of *Clinical Cancer Research*. The study was subsequently noted in *Hematology Times*, *FirstWord Pharma*, *Science Daily*, *MDLinx*, and *MedicalXpress.com*.

Marnie Peterson was a co-author of “Superantigens are Critical for *Staphylococcus aureus* Infective Endocarditis, Sepsis, and Acute Kidney Injury,” published in the



Above: Dick Brundage at GAPSA’s Annual President’s Reception. Opposite page: ECP graduate student Kinjal Sanghavi with her advisor, Pamala Jacobson, one of this year’s winners of the Outstanding Advisor Award. (Photos: Kevin Lang/GAPSA)

August 2013 issue of *mBio*. The study was subsequently noted in *Infection Control Today*, *News Medical*, Fox News, KWWL-TV (Iowa City), and KCRG-TV (Cedar Rapids).

Debra Skaar was a co-author of “Effects of Patient-Directed Music Intervention on Anxiety and Sedative Exposure in Critically Ill Patients Receiving Mechanical Ventilatory Support,” which appeared in the June 12 issue of *JAMA: The Journal of the American Medical Association*.

Janel Long-Boyle, Pharm.D., Ph.D. ('09)

Assistant Professor of Clinical Pharmacy
University of California San Francisco School of Pharmacy

Janel Long-Boyle is a translational scientist with expertise in quantitative pharmacology, population PK/PD modeling, pharmacogenomics, and clinical trial design. This includes study design optimization, dose selection, prediction of drug exposure through modeling/simulation, and the application of optimal or sparse sampling in pediatric drug studies. Much of her research has been in the clinical pharmacology of chemotherapeutic drugs and immunosuppressive agents used in pediatric bone marrow transplants.



Janel Long-Boyle's interest in clinical pharmacology was piqued as an undergraduate majoring in biochemistry, when she had the opportunity to participate in a directed research project. The work exposed her to basic laboratory research, protein chemistry, enzyme kinetics, and *in vitro* based pre-clinical drug development. Although she found the science extremely rewarding, something was missing: she wanted to see firsthand how the research translated to patient care. This early experience galvanized her decision to pursue both a professional pharmacy degree and doctoral training in clinical pharmacology. "I never considered the two paths independent of each other," she says.

In the ECP graduate program, Dr. Long-Boyle was able to follow an individualized training program that helped her acquire the skills she would need in order to become a successful, independent clinical investigator. Her first two years in the program were dedicated to coursework in biostatistics, advanced pharmacokinetics, drug metabolism, and clinical trial design. In her final year, she applied her new skills to designing studies and conducting pharmacokinetic analyses under the guidance of her research advisor. She had opportunities

to collaborate with physician scientists, basic researchers, study coordinators, nurses, and pharmacists. "The experience of conducting research through a multidisciplinary approach was invaluable," says Dr. Long-Boyle.

"Designing a great clinical trial takes more than just good statistics and a power calculation. If the protocol isn't practical or translatable after the trial ends, then ultimately I have failed my patients."

In her work today, she draws from both degrees in order to be an effective translational scientist. "The most exciting and rewarding aspect of my job is translating what we are learning in the laboratory directly to patients in real time," she says. "My Ph.D. enables me to make the best possible informed decision regarding drug therapy through the application of advanced clinical pharmacology methodologies, particularly in children (where evidence-based PK/PD data are routinely lacking), or other complex pa-

tient populations where multiple drug interactions, co-morbidities, or pharmacogenetics must be considered."

Similarly, her professional degree and clinical experience benefit her as a researcher. "My Pharm.D. allows me to design research protocols that are practical, easy to implement, and most importantly, patient-oriented," she says. Speaking a common language with physicians, nurses, and clinical pharmacists results in a scientifically sound study that yields information easily applied after the clinical trial is over.

This patient-centered thinking is critical, maintains Dr. Long-Boyle, especially in today's economic climate. Students training in experimental and clinical pharmacology today must gain an understanding of issues such as compliance, drug formulations and compounding, cost, and accessibility. In addition to science, Dr. Long-Boyle says, all of these must be considered early in basic research and continue through trial design and completion.

"Designing a great clinical trial takes more than just good statistics and a power calculation," says Dr. Long-Boyle. "If the protocol isn't practical or translatable after the trial ends, then ultimately I have failed my patients."

Summer Research Program at CTSI Allows Students to Build Investigative Skills, Present Scientific Work

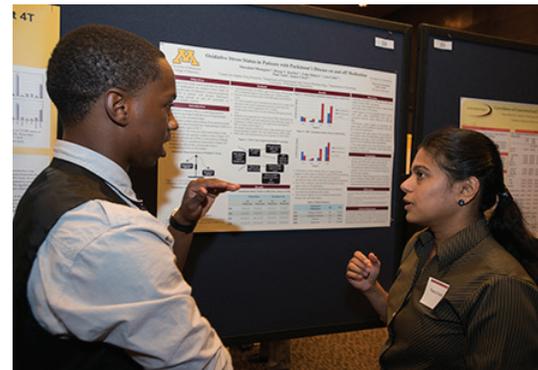
Nine students mentored by ECP faculty were selected to participate as scholars in the prestigious summer research programs of the Clinical and Translational Science Institute (CTSI) and the Center for Health Equity (CHE) this summer. The programs allow gifted University students the opportunity to pursue an ongoing research project on a full-time basis with a faculty mentor who is an established investigator.

Graduate students **Malek Okour** (mentors: **Dick Brundage** and **Pamala Jacobson**) and **Youssef Roman** (mentor: **Robert Straka**), professional students **Angela Jeong** (mentor: **Ling Li**) and **Rebecca Pulk** (mentor: **Pamala Jacobson**), and medical student **Anthony Wiseman** (mentor: **Pamala Jacobson**) were scholars in the Advanced Research Program. Undergraduate student **Mnwabisi Mbangata** (mentor: **Jim Cloyd**) was a scholar in the Undergraduate Research Program. Professional students **Wing Chan** (mentors: **Mark Kirstein** and **Pamala Jacobson**), **Irene Vuu** (mentor: **Jim Cloyd**), and **Jenny Xiong** (mentor: **Robert Straka**) participated as Melendy Scholars.

All presented their research at the 2013 CTSI Poster Session & Reception on October 1, which featured the work of nearly 70 researchers from CTSI programs, including faculty (such as ECP associate professor Marnie Peterson, who received a CTSI R-to-R grant earlier in 2013).

Impressively, three of the ECP scholars were selected as winners of the 2013 Poster Session Travel Awards in their respective categories. For their outstanding projects, the winning scholars will receive \$1500 in travel funds to present their CTSI-sponsored research at a national meeting of their choice. (Dr. Peterson also won in her category.)

Congratulations to Malek Okour, who won for his project “Population Pharmacokinetic Analysis of Mycophenolic Acid”; Jenny Xiong, who won for her project “Pharmacogenomic Investigations in the Hmong: CYP2C19 Single Nucleotide Polymorphisms (SNPs) as Predictors of Drug Response”; and Mnwabisi Mbangata, who won for his project “Oxidative Stress Status in Patients with Parkinson’s Disease On and Off Medication.”



Undergraduate Research Program scholar Mnwabisi Mbangata discusses his research with ECP research assistant professor Reena Kartha. (Photo: Center for Health Equity/CTSI)

2014 APPLICATION INFORMATION

The 2014 Summer Advanced Research Program deadline has passed.

2014 Undergraduate Research Program (applications due by noon on March 7):

Undergraduate students interested in health equity or minority research or from a population underrepresented in research are encouraged to apply.

<http://www.ctsi.umn.edu/education/programs-opportunities/UndergraduateResearchProgram/>

2014 Melendy Scholarships—CTSI Opportunity (applications usually due in March; check website for deadline):

First year, second year, or third year professional students in the College of Pharmacy who are interested in translational pharmaceutical research are encouraged to apply.

<http://www.pharmacy.umn.edu/pharmd/curriculum/studentresearch/>

ECP Student on First-Place Team in Medtronic Competition

Interdisciplinary competition promotes collaboration, innovation, and leadership in healthcare and the medical device industry

ECP graduate student **Suresh Agarwal** was among the team that took first place at the 5th Annual Medtronic Interdisciplinary Healthcare Case Competition, an event coordinated by the Medical Industry Leadership Institute Student Association (MILIsa) and sponsored by Medtronic, Inc., which was held October 17-19, 2013.

In the competition, eight interdisciplinary teams of 4-6 graduate students—from programs as diverse as medicine, business, engineering, pharmacy, dentistry, and public health—were presented with a real-world challenge that Medtronic is currently facing. Teams then had 36 hours to collaborate on an innovative solution.

The case that Medtronic presented to the teams involved a medical device,

InterStim, which is currently FDA-approved for overactive bladder, urinary retention, and fecal incontinence. The device has been on the market for 15 years; Medtronic is seeking to increase sales both domestically and globally.

Suresh, whose research interest is pharmacometrics, was on a team that consisted primarily of MBA students. “The perspective I brought to the table, (my) pharmacology background, was interesting to other team members,” Suresh said. “My experience in the ECP graduate program and CODR was very instrumental in designing both the short- and long-term strategies for the company.”

Teams presented in the first round to a panel of judges that included Medtronic employees, University professors, and



ECP graduate student Suresh Agarwal (far right) with his teammates after placing first in the Medtronic competition. (Photo: Marissa Szody)

experts in the medical device field. Three teams were then selected to advance as finalists and present their recommendations to senior management of Medtronic. Suresh’s team ultimately placed first in the competition, winning a cash prize of \$4,000.



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