



Editorial

It is readily apparent, even to the most casual observer, that we have entered an era in which there is increasing convergence of disciplines, certainly across all sciences. The purpose of this editorial is to draw attention to the potential impact of this knowledge transformation on clinician scientist training - emphasizing but not restricted to the MD/PhD program.

The majority of students who currently enter clinician scientist training programs begin their higher education by selecting a pathway in one of the life sciences at the undergraduate level, which then flows naturally into one of the traditional graduate departments in the Faculty of Medicine, and eventually culminates in postdoctoral experiences that merge medical/biological science with clinical interests.

So far this educational background has been successfully exploited by at least 2 generations of MD/PhD graduates in the US, and over the last 25 years in Canada. In fact, the graduates from these programs form the leadership cadre in academic medicine.

However, I have been asking myself - is this the best educational platform to prepare the next generation of MD/PhD students for the "big unanswered questions" in biology and medicine that remain unsolved? At a personal level, what would I choose to do in research if I was just getting

started as an MD/PhD student and how would I prepare myself for a lifelong career in research as a clinician scientist?

In my view, the most exciting and challenging questions emerging in modern biology and medicine will require for their solution a reversal of reductionist strategies and movement up the ladder of complexity. To illustrate - how can we reconstruct from detailed molecular and genetic data bases single cell and ultimately, whole organs functionality? These comments apply not only to content in basic biology but also to population genetics, epidemiology, bioinformatics, and even health economics!

My feeling is that it will not be possible to address questions of biological complexity without using the tools of physics/mathematics, computer science. For example, how the brain processes information - a question that goes to the heart of understanding cognition - is unlikely to be answered from current traditional biologically based neuroscience approaches which have for some time been generating huge amounts of data without any unifying hypothesis. Rather it will require testing new conceptual frameworks that are able to predict the global behavior of populations of interacting cells and reconstruct from a modeling perspective, hierarchical functions of sight, hearing etc.

Therefore, to prepare future MD/PhD candidates for life long careers in research we first need to develop undergraduate

educational pathways that provide sufficient background in the so-called "hard sciences". This will allow students to undertake graduate programs that involve advanced methodologies in the natural and computer sciences focused on biology.

We must also rethink the curriculum of their graduate programs and introduce new cross disciplinary options that will prepare graduates for advanced research in the new era.

So my advice to current and future MD/PhD phenotypes, whatever their research/clinical interests, is to begin forming collaborative relationships and if possible engage in training/retraining in the natural and computer sciences. I believe this can be accomplished by building new collaborative degree programs between the Faculty of Medicine and other Faculties in the University. Given the research strengths available at the University of Toronto I have no doubt this can be readily accomplished at multiple levels during the training pathway. The research advantages that will result are substantial at the fundamental discovery as well as in the applied domains of nanomedicine, biomedical engineering, and population health, all of which will lead to tremendous benefits to clinical medicine.

Mel Silverman

Weizmann Tribute to Former Dean Aberman to Benefit MD/PhD Students

The MD/PhD Program at the University of Toronto originated in 1984, but it was only during Dr. Arnie Aberman's tenure as Dean of Medicine (1992 - 1997) that a quest for long term stable funding was begun in earnest. Dr. Aberman recognized that to be successful, to endure the very long training pathway necessary to become a clinician scientist, required full funding for every student in the MD/PhD Program. So it is fitting that proceeds from the Tribute to Dr. Aberman by the Weizmann Institute of Science

and the University of Toronto Faculty of Medicine, will go to support MD/PhD students at U of T, and trainees in the PhD for MD's Program at the Weizmann in Israel. This tribute to one of Canada's leading advocates for MD/PhD programs will be held on Monday, November 3, 2008 at Toronto's Sheraton Centre Hotel at a dinner co-chaired by U of T President Professor David Naylor, and by Professor Daniel Zajfman, President of the Weizmann Institute of Science.

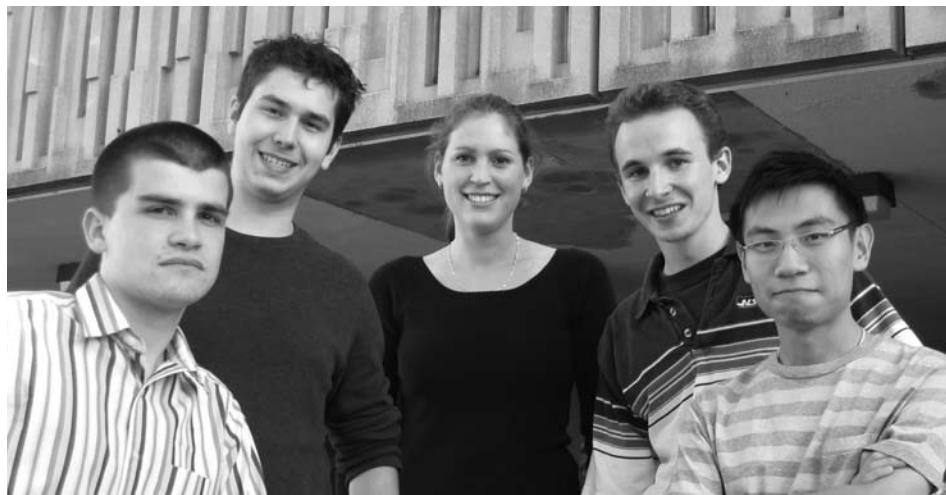
Incoming MD/PhD Students 2007

David Tsui

I was born in Hong Kong and moved to Toronto before high school, where I developed a strong interest in the nervous system which led to my study of neuroscience for my H.B.Sc here at the University of Toronto. Since my first summer of university, I had the valuable opportunity to work under Prof. Derek van der Kooy investigating the neurobiology of learning and memory in *C. elegans*. With this simple organism yet powerful model that has a completely sequenced genome and an extensive map of synaptic connections between its 302 neurons, we used both forward and reverse genetics approaches to understand the neuronal and molecular substrates underlying various learning behaviours. I gained valuable research experience as well as expanded my scientific horizon through exposure to various research topics in the lab. In my spare time, I like to listen to music and read about science. I also play the violin and enjoy table tennis.

Janine Hutson

Despite growing up in a small town with only 2 stop-lights, I have come to love the city of Toronto during the past few years. At the University of Toronto, I completed my H.B.Sc. in toxicology in addition to my M.Sc. in pharmacology. My interest in research was sparked by a summer spent working for Dr. Gideon Koren in the area of developmental pharmacology. I later worked for Dr. Shinya Ito at the Hospital for Sick Children and completed a fourth-year project with Dr. David Riddick, both looking at regulation of the drug metabolizing enzymes, cytochrome P450. After graduating, I decided to return to Dr. Koren's lab and pursue a Masters degree developing a biomarker for prenatal alcohol exposure. As an MD/PhD student, I look forward to expanding my research and clinical interests. Outside of school, I hope the next few years will lead to the Toronto Raptors winning a basketball championship and the Maple Leafs, well...



Brian Ballios

I was raised in Mississauga and have entered the MD/PhD program after completing my BSc.E. in Engineering Chemistry at Queen's University. My engineering education has been intensive and far-reaching. Never satisfied with simply learning and memorizing scientific facts, I have instead always been interested in the potential real-life applications of a given principle and it is perhaps this which has drawn me to the MD/PhD program. I chose to pursue the Eng Chem program because it satisfied my interest in aspects of both theoretical chemistry/biochemistry as well as the practical side of engineering design and control. I have worked on projects in the development of polymeric "lab-on-a-chip" microfluidic devices, in particular focusing on the coupling of proteolytic enzymes to the surface of microchips for on-line degradation and subsequent analysis of protein fragments by mass spectroscopy. For my undergraduate thesis project, I was engaged in the synthesis of polymeric nanospheres by microemulsion polymerization. I have also worked on the development of a first principles mathematical model to describe the dynamic evolution of mass transfer processes into and out of spherical hydrogel particles, to be used as bioartificial devices for the production of insulin by encapsulated islet cells inside a selectively permeable matrix. For the past two years, my major research focus has been the synthesis and development of implantable biodegradable elastomeric materials for drug delivery and other tissue engineering applications. It is this research, and the interaction with

individuals at the forefront of medical science research, which sparked my interest in the cross-over between laboratory research and clinical application and the value of a clinician-scientist who can bridge that gap. Outside of school, I enjoy jogging, playing pick-up games of softball with my friends, going out, or even staying in to watch television or read. I'm very excited about the upcoming years in the program, and working together with an extremely talented and diverse group of colleagues.

Marko Skrtic

I was born in the small town of Karlovac, Croatia but my family moved to Hamilton in 1991. During high school, a grade 9 Science teacher inspired me in the study of science, through the teaching of mitosis and meiosis, and outside of school, I became the lead singer of a Croatian wedding band, which took me across Canada and the US. For university, I decided to stay at home in Hamilton and attend McMaster University, where I studied biology and psychology, at the same time performing with the Croatian band on weekends. My first research experience was in the summer of 2004 studying the role of the extra-cellular matrix in heart failure in the Department of Cardiac Surgery here in Toronto under the joint supervision of Drs. Paul Fedak, Ren-ke Li and Richard Weisel. My major research interest over the last two years has been the role of cigarette smoke on innate immune responses to bacteria in mouse models of chronic obstructive pulmonary disease. This work was done as a part of my Honours thesis in the lab

of Dr. Martin Stampfli in the Department of Pathology at McMaster, where I was dubbed “the wedding singer” – a tribute to my early Friday absences from the lab when going on the road for the weekend.

Currently, I’m still involved musically within the Canadian-Croatian community, and am looking to combine my previous research experiences into an exciting PhD project. In my spare time, I enjoy taking advantage of the great musical, and art opportunities that Toronto has to offer.

Mike Bohdanowicz

Born in Warsaw, Poland, I moved to Burlington, Ontario when I was six years old. Like a few students who entered this program before me, I opted to stay close to home and I attended the Health Sciences program at McMaster University. Eager to find my niche, I attempted research in several fields including biochemistry, neuroimmunology, and mathematics during my four years at McMaster. Although

I never achieved a major breakthrough in any of these pursuits, I was motivated by the small discoveries, or *aha-erlebnisse*. In Dr. E. Brown’s lab, for example, I found out that I could double my efficiency by using two pipettes (one in each hand) and in Dr. J. Foster’s lab I realized that mice liked to be petted before they were poked. Despite several incidents involving hydrochloric acid and murine banzai attacks, I managed to survive to this day. I eagerly await what the next few years have in store for me.

STUDENT RESEARCH FOCUS: 2007 CSCI Young Investigators Forum Winners

Michael Ward

Mike is in his 6th year of the MD/PhD program at the University of Toronto working under the supervision of two clinician scientists in cardiology, Dr. Duncan Stewart and Dr. Michael Kutryk. Generally, their work involves developing cell-based therapies for cardiovascular diseases, and are currently running a clinical trial of autologous cell-based gene therapy for pulmonary arterial hypertension, while preparing a similar trial for acute myocardial infarction. His project deals specifically with addressing a caveat of autologous cell therapy in the clinical arena, that is, the endothelial progenitor cell (EPC) dysfunction found in patients suffering from coronary disease and atherosclerotic risk factors. This EPC dysfunction could explain the disappointing reports from clinical trials following very exciting results from preclinical models. He is employing gene transfer technology to attempt to overcome this dysfunction and hopefully improve the efficacy of autologous cell therapy following acute MI.

Sagar Dugani

Sagar started his PhD studies in January 2007 under the supervision of HHMI International Research Scholar Dr. Freda Miller and Dr. David Kaplan, Canada Research Chairs, at The Hospital for Sick Children, Toronto. The Kaplan/Miller laboratories have had a long-standing

interest in 3 major research fields: the regulation of neurogenesis, and neuronal survival, growth and connectivity, in physiological and pathological conditions, the application of neural stem cells and multipotent skin-derived precursors (SKPs) to tissue regeneration, and the modulation of proliferation, survival, and migration of neuroblastoma and medulloblastoma cells. Currently, he is exploring the role of the p53 family member, p63, in the genesis and survival of neurons. These studies will help to understand the involvement of p63 in normal development and disease-states.

Amparo Wolf

Amparo is a PhD student in Dr. Abhijit Guha’s laboratory, located at the Arthur and Sonia Labatt Brain Tumour Research Centre at The Hospital for Sick Children Research Institute. The lab’s main focus is the molecular pathogenesis of nervous system tumours, particularly Glioblastoma Multiforme (GBM), the most prevalent and malignant of adult human primary CNS tumours. GBMs remain to this day a lethal tumour, due to persistent local recurrence and invasion into the surrounding brain. Amparo’s main research interests include investigating the intratumoural variations in glycolytic metabolism in GBMs and its functional significance with respect to resistance to apoptosis in GBM cells. We postulate that expression of hypoxia-induced glycolytic genes in GBM cells modulates resistance to tumour cell apoptosis via its effects on

mitochondrial function. One particular glycolytic gene, hexokinase 2 (HK2), is not expressed in normal brain but is strongly expressed in hypoxic perinecrotic regions of GBMs. She found that inhibition of HK2 favoured the release of cytochrome c and activation of caspase-mediated apoptosis, especially under conditions of hypoxia. In addition, inhibiting HK2 increased the susceptibility of GBM cells to radiation- and chemotherapy-induced apoptosis, the two current adjuvant treatments for GBMs. Stable knockdown of HK2 with shRNA in a U87 GBM cell line was found to promote mitochondrial membrane permeability and a return to oxidative phosphorylation. Therefore, these results suggest that inhibition of glycolytic enzymes such as HK2 in GBMs may provide a novel strategy to augment apoptosis-mediated therapies.

WELCOME BACK!

Amy Lin

Having now completed over a decade of higher learning at the University of Toronto, I can safely say that it is wonderful to be in the final stretch of my MD/PhD journey. It seems like a very long time ago (likely because it was) when I left OT4 to start graduate school, and now as I join the class of OT10, I am feeling a mixed bag of nervous energy, excitement and apprehension. As I look around at my new classmates, I see a lot of familiar faces – familiar because I was their histology TA last year, and I can’t help but wonder what the next 3 years in medical school will be like compared to my years in the lab. Four

Continued on page 4

hours of class every day compared to 4 hour incubations? Pipette or stethoscope? One hundred multiple choice questions versus oral examinations? Seminar versus lab meeting? Rounds or Departmental seminar? Last and undoubtedly the most challenging: starting the day at 8:00 a.m. vs 10:00 a.m. (or later)!

Luckily, with a class of 7 MD/PhD students re-entering Medicine this year, I am not alone. Together we navigate through introductory meetings, Medsis, the Alice in Wonderland-esque entity known as the Portal and stacks and stacks of lecture notes. Distilled from our stories and experiences that could easily rival Giller Prize winning anecdotes of medicine, we have compiled a Re-entry checklist for MD/PhD students, which is now on the MD/PhD website at www.utoronto.ca/mdphd/re-entry_chklst.

First and foremost, start planning well in advance! We found it helpful talking to our MD/PhD peers who had integrated before us for survival tips, such as the location of the new TWH Medical Education Office, acquiring a new access badge, or how to survive Foundations of Medical Practice. On the administrative side, good communication with Sandy McGugan and Dr. Silverman at the MD/PhD Program office is invaluable, and becoming re-acquainted with the Faculty of Medicine, in particular Student Affairs, the Registrar, Academy directors, various pre-clerkship directors and Financial Services will make the transition smoother. Last but not least, getting in touch with your MD/PhD class representatives and class presidents can also help you get to know your new classmates (that is, if you didn't teach them the his-

tological difference between stomach and large intestine the year before).

In the end, while at times, rejoining the class of 0T10 was as confusing as the class name itself (is it 1-T-0 or 0-T-10?), we survived. As I sit in MSB Lecture Hall 3154, I am surprised at how easy the transition was from grad student to med student. As I return to my multi-colour highlighters, pre-exam rituals, and professional ASCM clothes, I like to think that I have not completely shed my grad student persona, and that I can rely on the wisdom, experience and independence that I learned through research and graduate school to help me through the next few years. And when my new classmates tell me that 26 isn't old, I smile and wholeheartedly agree.

CITAC: A National Platform for Clinician Investigator Trainees

Sagar Dugani and Michael Ward

The Clinician Investigator Trainee Association of Canada (CITAC) is an organization for trainees enrolled in MD/PhD, MD/MSc and Royal College Clinician Investigator Programs (herein referred to as MD+ programs). A national forum to promote the academic training and post-graduate career opportunities of trainees within Canada, CITAC has four specific goals: a) developing a national database with information on current programs and career opportunities in Canada, b) disseminating information to all trainees through newsletters, the organization website, and at the annual meeting, c) developing a strong networking infrastructure of clinician investigators and trainees to promote mentorship and collaboration and d) lobbying for greater trainee support, through additional scholarships, loans, and other financing options for trainees.

Advancing the mission of CITAC requires leadership, teamwork, and effective communication. Accordingly, CITAC has been structured to have a core *Executive* and a team of institutional *representa-*

tives. Current members of the executive are Michael Ward (President; UofT), Tom Appleton (Vice President-External; UWO), Aaron Joe (Secretary; UBC), Hugues Allard-Chamard (Treasurer; Université de Sherbrooke), Fiona Young (Co-VP-Internal; UBC) and Houman Khosravani (Co-VP-Internal; UofC). The representatives, elected by the concerned institution, are listed on the CITAC website (<http://www.citac-acfc.org>).

Currently, CITAC is working on developing several programs and information gathering strategies. Institution representatives are collecting information regarding the various trainees, MD+ programs and post-graduate opportunities at each university, in order to develop a database for use by members in planning various stages of their careers. The database will also contain information about each trainee's progress, to be used confidentially to monitor the outcomes of MD+ programs, as well as to inform policy-makers about the efficacy of the clinician investigator track in Canada. To help trainees more directly, CITAC is organizing a national mentorship program, with digital communication facilitation throughout the year and an in-person event to be held at the CITAC Annual Meeting in September. In addition to their formal affiliation with the Canadian Society for Clinical Investigation (CSCI), CITAC

is also in the process of affiliating with the Canadian Foundation for Medical Students (CFMS), in as much as they can extend certain CFMS benefits to CITAC members and work with CFMS to lobby for MD+ specific issues at the national level. Lastly, the CITAC annual meeting will once again be hosted with the CSCI, but it is hoped that through encouragement of greater trainee participation the meeting can become the primary medium through which clinician investigator trainees can form collaborations and network to expand career opportunities and information transfer. In order to execute these programs, CITAC has initiated a fundraising strategy, involving individual institutions as well as broader funding bodies, which will hopefully ensure the sustenance and growth of these activities.

As a national forum, CITAC represents all university MD+ programs equally, regardless of size, geographic location or fields of study offered. As we move forward, we hope to facilitate the expansion of programs and to promote the inclusion of a broader range of research areas within the context of these training streams.

CSCI 2007: Winnipeg, Je T'aime

Jonathon So

"No one loves Winnipeg more than Laura Erdman," I heard someone say just as we were leaving for the annual Canadian Society for Clinical Investigation conference in Winnipeg. With its iconic "golden boy" on top of the legislature building, the historic Red River, Winnipeg has something for everyone to love, and that was certainly true about this conference.

The first morning began at 8am with poster set-up. The last time I remember waking up so early was for Structure and Function, so it was fortunate the hotel was attached to the conference centre. Forty-nine MD/PhD and CIP trainees were present from 9 schools across Canada. Many were veterans of past CSCI meetings, so it was good to see old faces. U of T had the largest contingent, with 13 of us presenting posters or giving oral presentations, including Sagar Dugani, Adam Durbin, Laura Erdman, Chris Franco, Neil Goldenberg, Martin Hyrcza, Alvin Lin, Amy Lin, Fiona Lovegrove, Varinder Randhawa, Mike Ward, Amparo Wolf, and myself. I was excited about the diversity of research presented from basic science to clinical research. Special mention goes to our U of T prize winners, Sagar Dugani for "Elucidating the role of P63 during development of the mammalian nervous system," Michael Ward for "Gene transfer of endothelial NO-synthase restores migratory capacity of endothelial progenitor cells from patients with coronary artery disease," Amparo Wolf for "The Warburg Effect and tumor cell survival in human GBM, and Chris Franco for his talk "Targeted deletion of discoidin domain receptor 1 (Ddr1) decreases atherosclerosis, reduces inflammation, and accelerates matrix accumulation in LDL receptor deficient mice." Following the poster session, Dr. George Wells from Ottawa gave the CSCI Distinguished Scientist Lecture. The afternoon session included student oral presentations chaired by Dr. Silverman, and then Dr. Guy Rouleau from McGill University was presented with the CSCI/RCPSC Henry Friesen Lecture and Award. The day ended with the



Forum dinner where we able to socialize and swap stories with the students from other schools across Canada. Over coffee and dessert we listened to the Joe Doupe lecture by Dr. Philip Devereaux from McMaster. After the dinner, as is tradition, our poster and oral presentation winners treated us to drinks at the local pub.

The next day, we began mercifully later in the morning with the CSCI symposium: "Clinician Investigators: pathway to future success." It focused on career-advice and training for future clinician-scientists. Drs. Danoff and Silverman presented statistics on the Royal College CIP program, and Drs. Tai, Hare, and Taylor spoke on their own experiences in the transition from trainee to independent investigator, and the importance and benefits of career mentorship. Drs. Tyrrell and Phillipson focused on funding clinician-scientists in the new millennium emphasizing the importance of providing salary support competitive with clinical counterparts, suggesting a model akin to the successful Canada Research Chair program. The symposium ended with a panel discussion and opportunity for questions from the audience. One issue that sparked active discussion was the idea of reducing the length of training with better integration of medical school with the graduate program. U of T received accolades from other program directors for its CIP program which integrates research with residency. It was agreed that there is a need to raise awareness of the necessity for clinician-scientists which might be facilitated by the inclusion of current and future clinician-scientists on various com-

mittees at the level of the Royal College and at our respective schools. Another major topic of discussion how to balance raising a family while completing a lengthy training and practicing as a clinician-scientist. We were grateful that many of the panelists shared personal examples of how they accomplished this, including some of the challenges they encountered. It was encouraging to see that many of the issues and concerns that we face are also shared by students in other programs.

Following the symposium, the students gathered for the first meeting of CITAC, the Clinician Investigator Trainee Association of Canada. The meeting began with an introduction to CITAC, outlining its goal to provide a forum for networking and sharing information among schools with the intent of raising institutional and public awareness of the clinician investigator. The second part of the meeting consisted of the election of the CITAC executive. We were encouraged to see this grass-roots cohesiveness forming, and look forward to participating in this national organization.

Finally the time came when we had to leave the city that we all had come to agree with Laura was awesome. The conference was much more than the 12 hours of "Accredited Group Learning Activity" my certificate said I had accumulated. What came out of the meeting was a sense of community and mutual support for our shared road ahead.

AWARDS

Sagar Dugani has been selected by the Canadian Medical Association (CMA) as recipient of the 2008 CMA Award for Young Leaders. This award which celebrates the efforts of young physician leaders, was made to Sagar for his active involvement and contributions to the Faculty of Medicine outreach program, and in recognition of his scientific productivity and activities within the medical school. The award will be presented at the CMA annual meeting in Montreal this coming August.

Adam Durbin was awarded First Place, Senior Trainee, Basic Science at the Department of Pediatrics Research Day, University of Toronto in May 2007. He also placed First in the Novel Therapeutic Interventions Category at the national Cancer Institute of Canada's 60th Anniversary *Making Connections* Conference. November 15-17, 2007. Representing the MD/PhD Program at the Eastern Student Research Conference in Miami in February, he was awarded Second Place for Outstanding Basic Science Oral Presentation. He will now go on to compete

at the US National Student Research Forum in Texas in April.

Graeme Schwindt won the Edward and Alice Palmer Memorial Scholarship for first year Medical Students, and the Chinese Canadian Medical Society Award in Anatomy.

Gord McSheffrey was the 2007 recipient of the Harry Whittaker Award for the first year medical student who, through involvement in extra-curricular activities, class events, and the establishment of class peer relationships, best exemplifies the personal qualities and achievements of Harry Whittaker in providing practical, sensitive and friendly guidance for their classmates and demonstrating concern for student welfare.

Chris Franco won the Farber Award for best poster at the 2007 Laboratory Medicine and Pathobiology Graduate Student Research Day, and also received an award for his presentation at the 2007 Canadian Society for Clinical Investigations Young Investigators Forum in Winnipeg.

Benjamin Steinberg placed first in the MD/PhD category at the 2008 CREMS Medical Student Research Day for his project on the nature of the counter-ion conductance required for lysosomal acidification.

David Hwang, MD/PhD2000 (Department of Laboratory Medicine & Pathobiology) is this year's recipient of the Canadian Association of Pathologists Junior Scientist Award. He will present a lecture entitled *Metagenomics of the Cystic Fibrosis Lung* as part of the Scientific Program of the Annual Meeting of the CAP in Toronto this June.

Rick Swartz, MD/PhD2004 has been awarded the 2008 Founders Award by the American Academy of Neurology for his research using MRI brain scans to study blood vessels in the brain that may be at risk of stroke. The award, intended to encourage clinical and translational research in neuroscience by physicians in clinical neurology training programs, will be presented to Rick at the AAN's 60th Annual Meeting in Chicago in April.

GRADUATION 2007



Peter, Kengo and Lori at Pre-Convocation

Congratulations to our graduating class of 2007 - Kengo Asai, Lori Edwards, Peter Hwang and Dawn Owen. They may have graduated together, but they are now spread out across the country, busy with their

residency programs of choice. Lori is at McMaster doing Pathology, Peter returned to Alberta to the U of A for Medicine, Dawn ventured to UBC for Radiation Oncology, and Kengo decided to stay at U of T for General Surgery.

MATCH 2008

The match results are out and everyone is delighted to have obtained their first choice for residency next year. Raymond Kim will be in Internal Medicine at U of T, Chris Heyn will also be staying at U of T for Radiology, and Rohit is leaving for Internal Medicine at Cornell with a plan to short track to Oncology at Memorial Sloan Kettering.

PhD's COMPLETED

James Kennedy, Molecular and Medical Genetics (John Dick, Supervisor) In vitro and in vivo modeling of human hematopoietic malignancies. November 23, 2007.

Fiona Lovegrove, Institute of Medical Science (Kevin Kain, Supervisor) Identification of host and parasite factors mediating the pathogenesis of severe and cerebral malaria. December 14, 2007.

Tony Yeung, Institute of Medical Science (Sergio Grinstein, Supervisor) Membrane surface charge and lipid signaling in phagocytosis.

PUBLICATIONS

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PHOTO ALBUM 2007



Fiona, Adam & Jon



Alvin & Alumni



Interview Day



Melissa, Dawn & Ivan

Pair O Docs is the newsletter of the MD/PhD Program at the University of Toronto. It is produced by the students in the program and is published once a year.

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COMMENTS/IDEAS/INQUIRIES

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