



Molecular Genetics
UNIVERSITY OF TORONTO

MoGeNews

Issue 1 - December 2013

Message from the Chair



We are delighted to share the first issue of **MoGeNews** with current faculty, staff and trainees as well as with our colleagues, alumni and friends. The goal of this web-based newsletter is to let you know of the many activities going on in the Department with a focus on research and education, the successes of our faculty and trainees in these areas, and new initiatives on which the Department is embarking.

For those of you who may have been out of touch for a while, the current name of the Department was adopted in 2007, replacing the confusing dual names held for more than a decade preceding the change: Medical Genetics and Microbiology (in the Faculty of Medicine) and Molecular and Medical Genetics (in the School of Graduate Studies).

The Department of Molecular Genetics continues to hold a leadership position in Canada and internationally as a premier venue for biomedical and life sciences research and education. Over the past several years, the number of faculty members appointed in our research-based M.Sc. and Ph.D. program has grown substantially and currently totals 95 professorial faculty members, while 40 professors, lecturers and instructors offer our professional M.Sc. in Genetic Counseling.

Our faculty members and research labs continue to be located primarily at four geographic 'nodes', two on campus (the Medical Sciences Building and the Donnelly Centre) and two in hospital-based research institutes (at the Hospital for Sick Children and at Mt. Sinai Hospital). We were deeply saddened to lose one of our most eminent faculty members, Tony Pawson of the Lunenfeld-Tanenbaum Research Institute at Mt. Sinai hospital, earlier this year. Tony Pawson was one of Canada's most renowned and revered researchers, and the impact of his contributions are discussed in more detail [here](#).

Our graduate program has expanded concomitantly with that of our faculty; currently we have 250 graduate students. Under the leadership of Prof. Peter Roy (Associate Chair and Graduate Coordinator), we have introduced many enhancements to our graduate training strategies and courses. A truly top-flight department must recruit, not only faculty members but also its students from around the world. Our international student cohort has tripled over the past decade, most notably through a very successful initiative to establish

partnerships with the top research and educational institutions in China, spearheaded by Prof. Chi-chung Hui (Associate Chair, International Partnerships).

Research and graduate education in the department now falls into six fields that span the frontiers of biological research and discovery in the 21st Century: Cellular and Molecular Structure and Function; Computational and Systems Biology; Functional Genomics and Proteomics; Genetic Models of Development and Disease; Molecular Medicine and Human Genetics; Molecular Microbiology and Infectious Disease.

Apart from its enviable reputation in research and graduate education, the Department also provides a rigorous undergraduate specialist and major in Molecular Genetics and Microbiology, as well as a recently introduced major in Genome Biology. Prof. William Navarre (Associate Chair and Undergraduate Coordinator) is in the process of revamping our existing undergraduate courses as well as introducing exciting new courses in cutting-edge biology. We are also in the process of developing our first online course – in microbiology – a new educational platform that will be accessible to both U of T and external students, and will be launched next year.

For additional Departmental information, please consult our beautifully redesigned website (www.moleculargenetics.utoronto.ca), with improved organization and links to our Twitter feed and our Facebook page. If you aren't connected to us via Twitter and Facebook- don't hesitate and like us now!

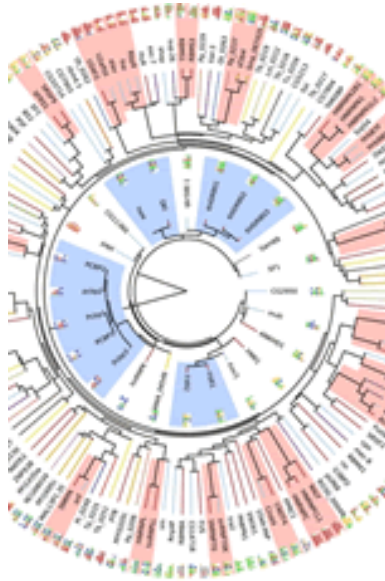
We hope that you will enjoy this newsletter, which will initially be published quarterly. My sincere thanks, to Prof. Leah Cowen (Associate Chair, Infrastructure, Communications and Alumni Relations), who has developed and edited the newsletter.

Please contact us with any suggestions and please feel free to forward this newsletter to your friends and colleagues.

Sincerely,

Howard Lipshitz

Research Highlights

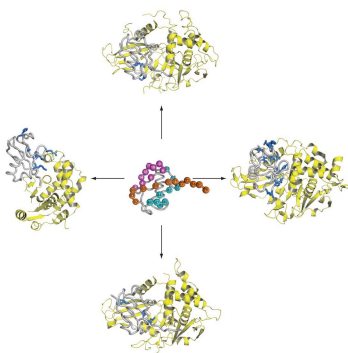


Study cracks universal RNA code, points to new cause for autism. (Nature 2013, 499:172-7). An international team led by MoGen scientists Timothy Hughes and Quaid Morris has taken a major step in understanding the role of genetics in disease, and in a surprising twist, the results point to a new cause of autism. The researchers unraveled most of a code that controls how DNA becomes the proteins that make up cells, a process called gene expression. The discovery represents an “RNA control code,” because it dictates how and when RNA moves genetic information from DNA to create proteins. Click [here](#) for more details.



Discovery of a new link in the DNA repair process of cells, vital to understanding cancer. (Nature 2013, 499: 50-4).

MoGen team led by Daniel Durocher discovered the function of a protein that is vital to the efficient repair of DNA damage. This protein, called 53BP1, responds to a unique ‘flare’ signal called ubiquitin (another protein involved in cellular regulation) when there is DNA damage present and then works together to accelerate the repair process. Click [here](#) for more details.



Development of a novel strategy to engineer ubiquitin to target enzymes involved in cancer and other diseases. (Science 2013, 339: 590-5).

MoGen scientist Sachdev Sidhu led an international team that exploited diverse combinatorial libraries of ubiquitin variants to identify those that can inhibit or activate target proteins. These variants can bind selectively in cells, providing a powerful strategy to selectively modulate enzymes in the ubiquitin system.

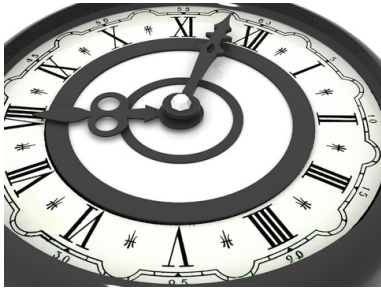


Image © Maxxyustas |
Dreamstime Stock
Photos & Stock Free
Images.

Study reveals mechanisms controlling temporal flow of signalling information crucial for cellular growth and survival.

(Nature 2013, 499: 166-71).

An international team led by Tony Pawson demonstrates that the scaffold protein Shc1 recruits successive waves of proteins to orchestrate temporal control over EGF receptor signalling.

For more Research Highlights click [here](#).

Faculty Highlights & Awards



Dr. John Dick receives Outstanding Achievements in Cancer Research Award from the Canadian Cancer Research Alliance (CCRA). Click [here](#) for more details.



Prime Minister presents Diamond Jubilee Medal to Dr. Jeff Wrana for innovation and discovery in cancer research. Click [here](#) for more details.



Dr. Janet Rossant has been awarded the prestigious Ross G. Harrison Medal for lifetime achievement from the International Society of Developmental Biologists. Click [here](#) for more details.



Dr. Mei Zhen was awarded a distinguished Harvard fellowship at the Radcliffe Institute for Advanced Study to advance neuroscience research. Click [here](#) for more details.

For more information on our Research and Genetic Counseling Faculty click [here](#).

Message from Associate Chair and Graduate Coordinator



Hello!

I thought I would take this opportunity to update you all on the major initiatives that the Graduate Office has taken in conjunction with others over the past few years.

The Department of Molecular Genetics aims to provide a world-leading graduate program for not only Canadians, but to the world at large as well. To make it easier for International Applicants to apply to our program, we have recently developed a novel application mechanism that does not require the international applicant to first identify a sponsoring professor. We expect that this application process will be more inviting to some of the world's top undergraduates. We are looking forward to our first batch of international applicants via this route in early 2014.

As you are all very well aware, science has become increasingly sophisticated and cross-disciplinary over the past decade. In recognition of this transformation, MoGen, together with the Donnelly Centre, has recently developed a novel PhD 'track' in the department called 'Quantitative Biology in Molecular Genetics', or 'QBMG' for short. The goal of QBMG is to provide a program for students with a background in the more quantitative sciences such as physics, math, computer science or chemistry, who want to apply their quantitative skills to solve biological problems. Previously, we did not accept students into our program who did not have demonstrable experience or prior coursework in a field related to molecular genetics. However, the QBMG program enables us to take on students with limited biology exposure because from day 1, the program will provide them with core biology knowledge and experience. We are eager to take on our first QBMG students in the fall of 2014.

Sincerely,

Peter Roy

Graduate Student Highlights & Awards



Anastasia Baryshnikova (left), Stephanie Panier (middle), and Rebecca Shapiro (right) will be presented the Vivash Award for best Ph.D.

thesis in Molecular Genetics. A mini-symposium to celebrate the awardees and hear about their accomplishments will be held on January 27, 2014 at 4 pm in Medical Sciences Building Room 4279.

MoGen students Isabel Leung and Masha Cemna secured funding from the American Society of Cell Biology to help support the 2013 Career Development Symposium they organized together with Mengshu Xu, Bilge Yoruk, and Max London.



Photo, Rob Davidson

Applications for Molecular Genetics graduate programs are now available.

- * Details for research based programs [here](#).
- * Details for genetic counselling program [here](#).

Message from Associate Chair and Undergraduate Coordinator



The Department of Molecular Genetics is committed to training the best students in Canada to be exceptional researchers by equipping them with the skills, concepts, vocabulary, and work habits necessary to succeed in science in 21st century. This can be a challenge given that over three thousand undergraduates enroll in a life science program at the University of Toronto each year! We have made several changes to our program to ensure that we provide great mentorship to the most qualified students to prepare them for future success.

This year we revamped our Specialist program to assign each of our incoming students a faculty mentor and give them unique opportunities to meet our most prestigious researchers face-to-face in small group discussions. Furthermore we offered to provide our Specialists with access to real research opportunities as early as second year. We also significantly raised the bar for admittance to our program. The opportunity to work closely with our professors generated a lot of enthusiasm among the top tier life-science students and resulted in an increased number of students choosing our Specialist program - up to 21 students in 2013 from 6 in 2012. By matching these exceptional students with our world-class faculty we aim to promote a culture of excellence and give each of our students a love of science that will last a lifetime.

We also worked to identify specific areas of excellence in our faculty around which coherent and exciting curricula could be built to prepare students for science in a modern laboratory. By focusing on these three areas (microbiology, genomics and bioinformatics, and human and model organism genetics) we can tap into the talent of our faculty to teach newer fields of science like genomics.

Connecting undergrads with our cutting-edge research programs was enhanced last year with the introduction of “MGY360 – Genomics Laboratory”. Led by Drs. Fritz Roth and Adam Rosebrock, this laboratory does away with recipe-based lab work and instead teaches science through discovery. Each student is given access to modern next-generation sequencing tools to sequence and assemble the genome of a previously unsequenced strain of yeast. The students then use recently developed bioinformatic tools to identify polymorphisms that can predict or explain the phenotypes of their strain. The tools and techniques used by these students didn’t exist even five years ago, meaning our students are being trained with the most modern approaches used in laboratories today.

Finally, our program is making its first foray into online education with a new course “MGY277 – Introduction to Medical Microbiology”, which will start in Winter of 2015. This course is being developed in cooperation with Public Health Ontario. This course will introduce microbes and the diseases they cause as well as how a modern diagnostic lab monitors and prevents outbreaks of infectious disease. MGY277 will be one of the first online life-science courses made available to U of T students for credit toward their degree. It will also be available online through the School of Continuing Studies for students outside of our University to use as continuing education, to fulfill degree requirements, or to meet entry requirements of professional and graduate programs.

We are excited by the success of the changes we have made so far. I will report regularly with further updates and developments as we continuously improve our courses and degree programs.

Sincerely,

William Navarre

Undergraduate Student Highlights & Awards



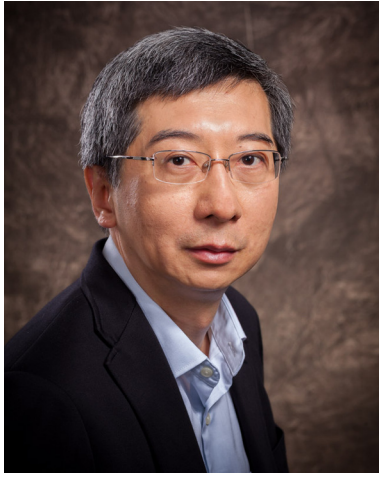
Photo, Mohammad Ali Saeed.

University of Toronto team led by MoGen students Adam Komorowski (president) and Boris Dyakov (lab manager) was awarded a Gold Medal at the iGEM 2013 Regional Jamboree North-America. MoGen student Graham Cromar was chair of the organizing committee. Click [here](#) for the U of T News Story.



Carly Weiss received the 2013 Clarence Fuerst Medical Genetics and Microbiology Student Achievement Award.

Message from Associate Chair, International Partnerships



In the past several years, the Department of Molecular Genetics has been actively engaged in building partnerships with several leading education and research institutions in China. A MoGen delegation, including Prof. Lipshitz, Prof. Brenda Andrews, Prof. Janet Rossant, Prof. Charlie Boone, Prof. Marc Meneghini, Prof. Jason Moffat, Prof. Bret Pearson, Prof. Ian Scott, Prof. Sachdev Sidhu and myself, recently visited our partner institution Shanghai Institute of Biochemistry and Cell Biology (SIBCB) of the Chinese Academy of Sciences in

October and participated in an exciting joint SIBCB-U of T symposium on “Stem Cells in Development & Disease”. After this, some of us also attended a “model organism genetics” workshop at the Model Animal Research Center of Nanjing University. We were delighted to visit Dr. Xin Lou, who was just recruited there to set up a zebrafish genetics lab after his postdoctoral training in the lab of Prof. Scott.

We have a highly successful summer internship program with Peking University, Tsinghua University and Nanjing Medical University, and next year we plan to expand this program to include Zhejiang University, another leading Chinese university in the beautiful city of Hangzhou. As mentioned by Prof. Lipshitz, the summer internship program has helped recruit many excellent Chinese students to our graduate program. In addition, through our outreach activities, we are recruiting some excellent Ph.D. graduates from our Chinese partners. For example, besides Dr. Lou, another SIBCB graduate, Dr. Lingyu Li, also recently completed her postdoctoral training in the lab of Prof. Rossant. Last month, Dr. Li published an elegant paper on embryonic ectodermal stem cells in the journal *Development*. She is currently pursuing additional postdoctoral training on endodermal and pancreatic progenitor cells in the lab of Dr. Seung Kim at the Stanford School of Medicine.

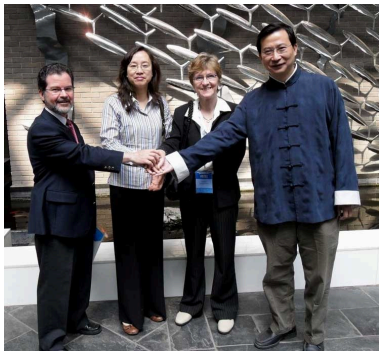
It is my belief that we need to build and maintain active partnerships with top institutions in the emerging world. Our efforts have already brought us many interactions and opportunities in China. I look forward to the challenge and excitement of establishing partnerships with other nations.

Sincerely,

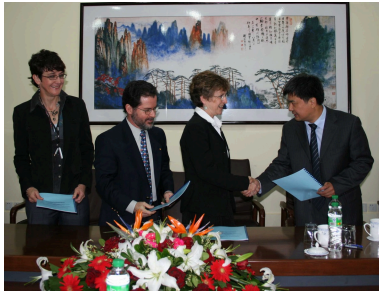
C.C. Hui

International Partnerships

The Department has established highly productive research and educational partnerships with Peking University, SIBCB, the Beijing Institutes of Life Sciences of the Chinese Academy of Sciences, the University of Hong Kong, Tsinghua University, Nanjing University and Nanjing Medical University. Notable are summer undergraduate research internships in the Department for students from Peking University, Tsinghua University, Nanjing University and Nanjing Medical University, as well as a joint educational placement agreement for Ph.D. students in the Department of Biochemistry at the University of Hong Kong.



Peking University and Tsinghua University.

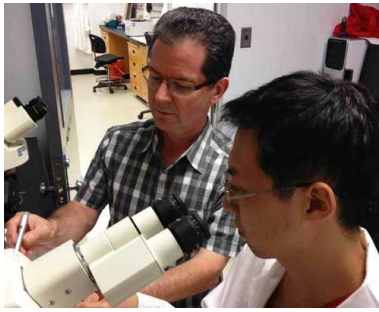


SIBCB.



University of Hong Kong.

International Partnerships News



These Molecular Genetics partnerships with several top Chinese universities are leading to lasting connections between students and faculty. Approximately half of the high-performing Chinese students recruited for summer internships have continued on to pursue graduate work in the Department. Click [here](#) for the U of T News story.

Alumni & Benefits

Since its inception in 1969, the Department of Molecular Genetics has produced over 1,000 alumni of its graduate programs and over 2,000 of its undergraduate programs. Many of our alumni are leaders in academia, research, health care and the private sector. We are always interested in hearing from our alumni and friends; updates can be submitted [here](#).

The Department is an active participant in the Faculty of Medicine's \$500-million fundraising effort as a cornerstone of Boundless, the University of Toronto's \$2-billion campaign. The Department's priorities are establishing endowed chair's for several of our leading faculty members; supporting our outstanding graduate students and postdoctoral research fellows; supporting our international partnerships; providing seed grants for innovative, novel research areas; and renewal of our core research infrastructure. More information can be found [here](#).

Alumni enjoy a wide range of services and benefits. Click [here](#) to explore the many alumni perks.

Message from Associate Chair, Infrastructure, Communications and Alumni Relations



We hope that you have enjoyed the first issue of **MoGeNews**. We welcome your suggestions and contributions, which can be sent to leah.cowen@utoronto.ca.

Sincerely,

Leah Cowen

To unsubscribe from this newsletter, please email us at address.update@utoronto.ca and include the subject line: Unsubscribe from Faculty of Medicine E-Newsletters

To update your contact information, click [here](#). Please include your full name and graduation year. If you receive multiple copies of this newsletter, please indicate your preferred email address



©2024 University of Toronto | University of Toronto, Toronto, ON, Canada

[Web Version](#)

[Preferences](#)

[Forward](#)

[Unsubscribe](#)

Powered by **Mad Mimi**®

A GoDaddy® company