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Molecular Genetics
UNIVERSITY OF TORONTO

MoGeNews

Issue 15 - March 2021

Editor's message

To say the past year has been a challenge is a huge understatement. Following the complete shutdown in March 2020, the campus and hospital nodes resumed research activities in June at reduced capacity. We continue to operate in this way, with physical distancing, masks and proper PPE, and disinfection protocols essential to our fight against Covid-19. We are very grateful and proud that our faculty, staff, postdocs and students have risen to this challenge to keep the department operating at the high standard to which we are accustomed.

We have recent leadership changes in the Department to report. Leah Cowen has stepped down as Chair to become the UofT's first Associate Vice-President, Research. Tim Hughes has assumed departmental leadership as Interim Chair. Julie Claycomb

stepped down as Graduate Coordinator after phenomenal service that has had a major impact on our graduate program. Lori Frappier is the new Graduate Coordinator, and Michael Wilson the Associate Graduate Coordinator. Cheryl Shuman has retired as the Director of the Genetic Counselling Program, a role she has held since 1998 when the program began. Stacy Hewson is the new GC Program Director. Please read the stories below for more information on these changes.

The COVID-19 pandemic continues to be the top challenge that we face in 2021. Links to University COVID resources are listed at the bottom of this newsletter.

Finally, this newsletter would not be possible without contributions from our community. Thanks to Laura Hergott, Tim Low, Zoe Clarke, Kuheli Dasgupta, Mallory Wiggans, Alan Davidson, Debra Gold, Stacy Hewson, Johanna Carroll, Sophie Karolczak, Kali Iyer, Martha Brown, Howard Lipshitz, Jovana Drinjakovic, Daniel Schramek and Julie Lefebvre for commentary and images for this issue.

As always, please keep us posted on discoveries, awards and achievements. Your input is crucial as we continue to build an engaged community.

Barbara Funnell

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Molecular Genetics Chair Transitions

Dr. Leah Cowen has been appointed U of T's first **Associate Vice-President, Research**, effective March 1, 2021. Leah has stepped down as Chair of the Department, a role she assumed in July 2016. The Department has benefited from outstanding leadership during her term as Chair. The newly created University leadership position will see Leah tasked with enhancing supports for U of T's scholars, mobilizing funding and boosting even further the quality and impact of research across the university's three campuses.
See the full story in UofT News.

Dr. Timothy Hughes has been appointed **Interim Chair and Graduate Chair, Molecular Genetics**, effective March 1, 2021. Tim is a Professor in the Department and in the Donnelly Centre for Cellular and Biomolecular Research. He has played significant administrative roles in Molecular Genetics, most recently as Associate Chair and Associate Graduate Coordinator and service on the MoGen Graduate Admissions and Faculty Appointments committees.
Please read Tim's "Welcome" to our community on the MoGen website.

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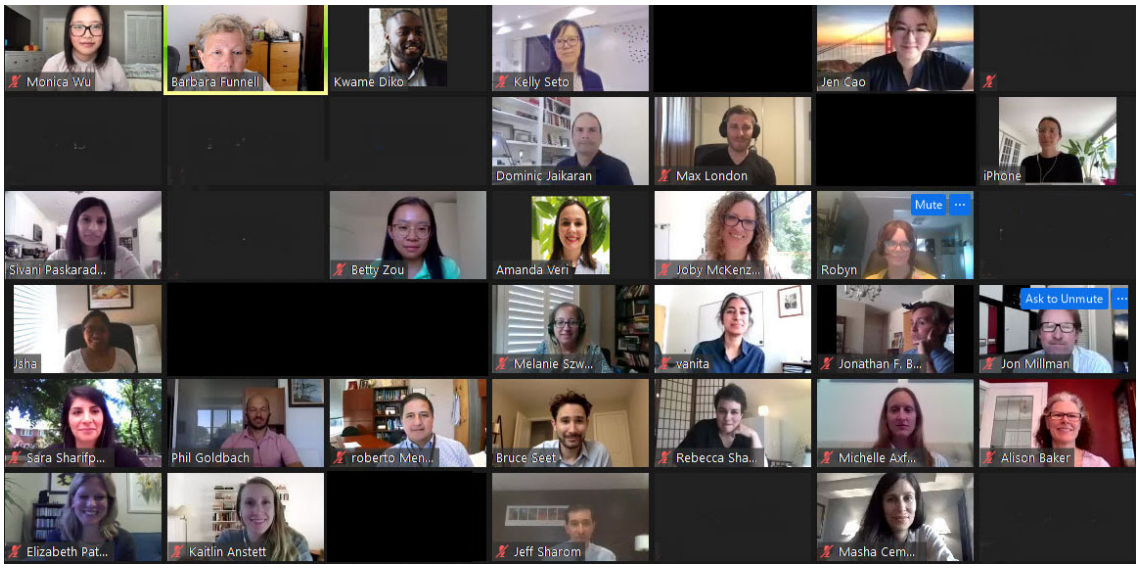
Community News and Events

5th Molecular Genetics Career Development Alumni Symposium



The 5th MoGen Career Development Symposium was held on Monday, June 15, 2020 on Zoom. Our goals are to promote interactions between trainees and our many extraordinary alumni from the Department of Molecular Genetics. We invited over 30 alumni as mentors (pictured above) from around the globe for the event. Six mentors agreed to be featured in short video interviews that we posted for the participants: Dr. Jennifer Cao, Scientist (Biomarkers), Gilead Sciences; Dr. Joby McKenzie, Managing Director, Babylon Health Canada; Dr. Jonathan Millman, Assistant Section Head, Ontario Centre of Forensic Sciences; Dr. Rebecca Shapiro, Assistant Professor, University of Guelph; Dr. Jeff Sharom, Senior Policy Advisor, Ontario Ministry of Health; and Dr. Vanita Sood, Global Head of Drug Disposition & Design (3D) at EMD Serono, Inc.

The afternoon included three round-table discussions in which alumni were "seated" in breakout rooms with small groups of trainees. These discussions were followed by two "focused learning" sessions, presenting career skills to our trainees: "Optimizing your LinkedIn profile" by Dr. Amanda Veri, and "Connecting the Dots: Expanding and Optimizing Your Network" by Dr. Bruce Seet. The event was very well attended; over 180 of our trainee, faculty, and alumni community participated in the symposium. It was an unqualified success!

The symposium was organized by Dr. Barbara Funnell, with invaluable and outstanding help from a large team of trainees: Laura Hergott, Sam Ing-Esteves, Kali Iyer, Nicole Revie, Matthew Rok, Kevin Shao, Lisa Shao, Ryan Smith, Keshna Sood, Amanda Veri, and Yuxi Xiao. The event would not have been possible without the excellent technical help from Kwame Diko.

Save the Date: The 6th

Molecular Genetics Career Development Symposium will be on **Monday, May 31, 2021 at 1 pm, online**. Stay tuned to the MoGen website for program updates and registration information!

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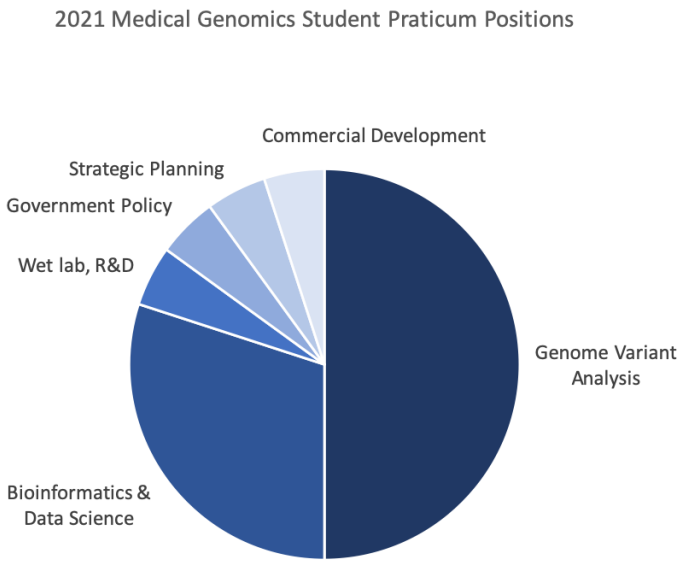
M.H.Sc. in Medical Genomics Program Update

The Medical Genomics program is now in its third year, and our Year Two students recently started their semester long practicum placements. The Medical Genomics program has partnered with sites throughout Ontario (and the world) enabling students to work with leaders in genomics research, diagnostics, and policy.



Despite the global pandemic, the number of positions available to students has more than doubled since last year. The most popular positions for the Class of 2021 involve genomic variant analysis and bioinformatics. A number of students are also engaged in projects focusing on policy, strategic planning and commercial development related to genomics. The program established a number of exciting new placements this year, including Canada's Genomics Enterprise & The Centre for Applied Genomics, Illumina Canada, The Center for Computational Medicine and many more!

If you or your organization is interested in hosting a future practicum student from the Medical Genomics program or you'd like to learn more about the process, contact the practicum faculty coordinator, Johanna Carroll, for more details. Recruitment for the 2022 practicum will begin in summer 2021.

The Medical Genomics program also is now accepting student applications for both the clinical and laboratory professional streams. Apply by May 1st for entry in September of 2021! More information: consult the Medical Genomics website.

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MoGen Retreat 2020.
The 2020 Molecular Genetics retreat was the result of a successful and energizing COVID Pivot by the GSA. Recognizing the importance of welcoming new students and bringing the community together during these difficult times, Nikki Case, Laura Hergott and their team rebooted the retreat, which had been canceled due to COVID restrictions. The GSA organized a virtual retreat that drew 254 attendees from our community. They refreshed the retreat format with a one-day program that included

student talks and an interactive Wellness workshop. And in these COVID times, the 2020 retreat apparel was a MoGen mask. The day began with talks by the new MoGen faculty: Drs. Rafael Montenegro, Hartland Jackson, Juri Reimand, Kieran Campbell, and Ji-Young Youn. In lieu of poster presentations, the GSA organized 3 concurrent sessions of student talks, selected from the submitted abstracts. Sixteen students gave 15-minute talks on topics that highlight diverse and high-quality research taking place across the Department. Another highlight of the day was a wellness workshop on Managing Imposter Syndrome presented by Shift Collab. The session engaged attendees in a thought-provoking discussion on how students and faculty alike are battling their Impostor Syndrome, as shown by anonymous sharing of Impostor "scores" in the chat. We thank the GSA for giving us an occasion to bring our community together during these challenging times.

MoGen Holiday Party: 2D Edition

MoGen students and faculty "gathered" together for our Annual Holiday Party on Dec 11, 2020 at our custom virtual venue hosted on Gather Town. Although the celebration was a little different this year, it still had all our festive favourites including a gingerbread contest (winner: "The Gingerbread Lab" made by the Claycomb lab), a DJ booth, a string quartet, and even a virtual photo booth! Leading up to the evening, our MoGen community came together to create a "MoGen Holiday Recipe Book" to share our

favourite recipes and also raised $585 for the Daily Bread Food Bank Drive. On the 11th, party-goers mingled amongst the 5 rooms, engaging with other students and faculty in some much-needed catching up and games of poker, pictionary, and a holiday themed game of team trivia. Our party wouldn't be complete without a tasty drink in hand and so guests also received a special cocktail/mocktail delivery to enjoy during the soiree! Every year the holiday party provides MoGen students and faculty the chance to cut loose and have a great time, and this year was no exception! Extra bonus: getting home safely was a no brainer and there was never a line at the bar!

MoGen Virtual Escape Room Event

On January 20th, over 40 members of the MoGen Department, including both students and faculty, gathered online to challenge the King of the Bootleggers virtual escape room hosted by Casa Loma Escape Games. We had a total of eight groups challenge this difficult escapade, which the hosts noted had a success rate of less than 20%. Everyone had a great time working together to solve puzzles, with a full six teams successful in their escape. We even had a team of all first year students come close to beating the time record for escaping - finishing the room in just 20 minutes!

MoGen Mental Health Initiatives

The MoGen GSA has been taking action to address the mental health and wellbeing of MoGen graduate students. It is important to not only recognize the challenges that many students face, but also come up with strategies on how to stay positive and healthy throughout one's degree. On **March 23rd from 5-6:30pm**, two professionals who have completed their own graduate journeys will be delivering a **Crush Imposter Phenomenon Workshop** that all in the Faculty of Medicine are welcome to attend. Initiating this series of workshops has been the result of a collaboration between the MoGen and Medical Biophysics departments at U of T. For more encouraging words, feel free to check out the GSA's mental health blog (here)

that features memes and interviews with your fellow students.

The **UofT International Students' Council** hosts events tailored to our international student community. We highlight the recent mental health, mindfulness and meditation workshop, called **Mindful Meditation**, held on Feb 11, 2021. Hosted by Robin Waley, Assistant manager, Co-Curricular Diversity and Equity from the Faculty of Kinesiology and Physical Education, the event stressed the importance of mindfulness to navigate through tumultuous times. The Council hosts a variety of events, including mental health support and career initiatives. Please follow them on Facebook and Instagram for announcements of and information on future events.

MG GSA Molecular Genetics Equity, Diversity, Inclusion Committee

Equity, Diversity, and Inclusion in Molecular Genetics

The GSA's new Equity, Diversity, and Inclusion (EDI) Committee aims to represent the graduate students' priorities as well as invoke thoughtful conversations regarding EDI-related issues within the department and our communities. We stand in solidarity with the Indigenous, Black and racialized communities fighting for social justice in Canada, the United States, and internationally. We are also acutely aware of the dark history and current day connections between medical violence, eugenics, slavery, and colonization.
Our goals are to raise awareness in our own department. For example, we initiated a Land Acknowledgement series at student seminars. Participating in land acknowledgement is a way to recognize the enduring presence and resilience of Indigenous peoples in this area for time immemorial. They are also a reminder that we are all accountable to these relationships.

Stay tuned for more initiatives we have in the works. If you have comments, suggestions, or ideas, please contact utoronto.mogen.edi@gmail.com. Additionally, we are actively looking for new members, so please reach out if you are interested in EDI and would like to join our committee.

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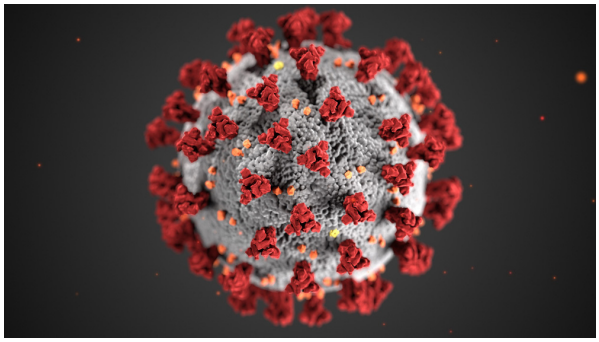
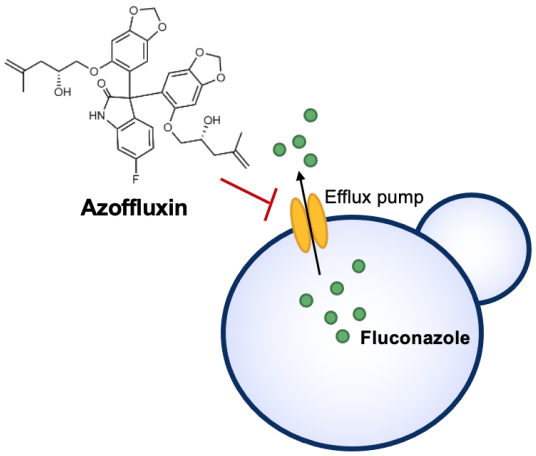
Research Highlights



Dr. Anne-Claude Gingras and **Dr. Jennifer Gommerman** (Dept Immunology) are co-leaders of a research study published in *Science Immunology* that examined the persistence of antibodies to SARS-CoV-2 in blood and saliva. A large team of scientists collaborated on the study, including the Gray-Owen, Rini, Sicheri and Wrana labs from MoGen. Their evidence suggests that antibodies to the viral spike protein are detectable for at least 115 days after infection of COVID-19 patients. Further, the study was the first to show that testing saliva may be a good

alternative to testing blood for the presence of these antibodies.
See the full story in Temerty Faculty of Medicine News.
(*Science Immunology* 2020, doi: 10.1126/sciimmunol.abe5511)

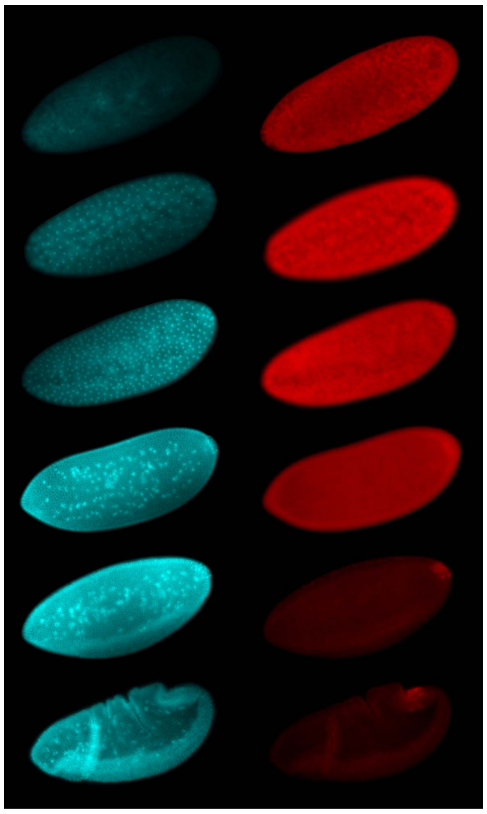


Novel efflux inhibitor sensitizes drug resistant fungi to frontline antifungal.

The human fungal pathogen *Candida auris* is extremely concerning due to widespread drug resistance. In fact, ~80% of clinical isolates are resistant to fluconazole, one of the few antifungal drugs available. A recent study led by **Dr. Leah Cowen**, published in *Nature Communications*, screened a library of ~2,500 diverse compounds and identified one hit molecule that potently synergized with fluconazole to inhibit fungal growth. They found that this molecule inhibited an array of fungal multi-drug transporters resulting in increased cellular accumulation of fluconazole, and therefore greater efficacy. For its fluconazole efflux inhibition, they named this molecule azoffluxin. Furthermore, they found the combination of azoffluxin and fluconazole significantly reduced fungal burden in mice infected with *C. auris*. Azoffluxin provides a key chemical probe to interrogate the importance of efflux pumps in drug resistance and highlights the value in screening chemical libraries to uncover fungal biology and vulnerabilities to target in antifungal development.
(*Nat. Commun.* 2020, doi: 10.1038/s41467-020-20183-3)

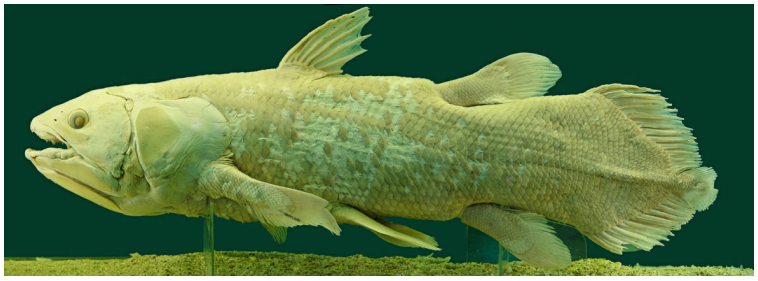
Understanding the handover of developmental control from mother to child.

All animal embryos undergo a transition from developmental control by maternally deposited gene products to those synthesized by the embryo itself. **Howard Lipshitz**'s lab studies RNA-binding proteins and their role in regulating maternal mRNAs during this developmental transition using *Drosophila* (fruit flies) as a model for molecular genetic and genomic studies. Recent work by his



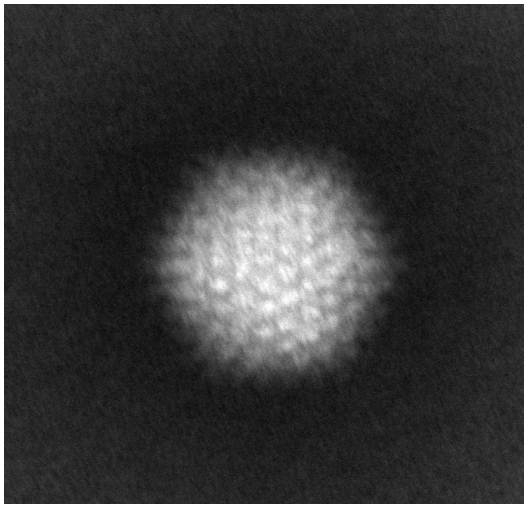
Immunofluorescent staining of the Smaug RNA-binding protein (red) and DNA (blue) in *Drosophila* embryos at various stages of the transition from maternal to embryonic control of development. Smaug protein is ubiquitously expressed in early embryos, and then rapidly degraded throughout the somatic region (but not the primordial germ cells) prior to gastrulation. The precise temporal regulation of Smaug degradation by the SCF E3 ubiquitin ligase is important to allow an orderly transition.

Ph.D. student, Wendy Cao, together with collaborators in Germany and the USA, has revealed that several RNA-binding proteins that play a key role in these early developmental processes are precisely targeted for clearance over a period of only a few hours once their functions are complete. Wendy showed that two different E3 ubiquitin ligase complexes – CTLH and SCF – act to degrade these RNA-binding proteins with precise but distinct timing. She went on to show that failure to degrade one of the RNA-binding proteins, Smaug, abrogates the coordinated progression of gene expression events and the successful handover from maternal to embryonic control. Given the evolutionary conservation of this developmental transition it is likely that parallel mechanisms occur in a wide range of animals, including humans.
(*Cell Reports* 2020, doi: 10.1016/j.celrep.2020.107783)



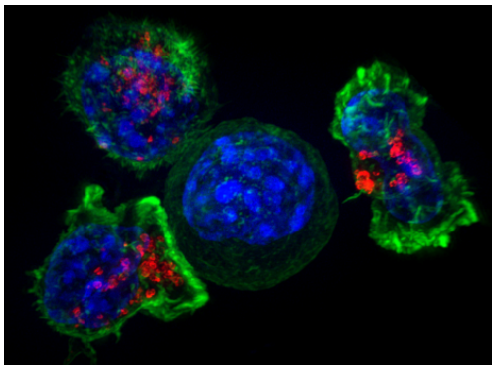
How the Coelacanth recently evolved dozens of new genes. The Coelacanth has been described as a "living fossil" owing to its anatomy looking almost identical to the fossil record. But while the Coelacanth's body may have changed little, its genome tells another story. A recent study led by **Dr. Timothy Hughes**, and published in *Molecular Biology and Evolution*, has revealed that the African coelacanth, *Latimeria chalumnae*, gained 62 new genes through encounters with other species 10 million years ago. Their sequences suggest these genes arose from transposons, which are mobile genetic elements capable of copying themselves within

their own or into other genomes. The actions of these 62 genes are unknown, but many look like DNA binding proteins, which can play major roles in gene regulation.The study shows the dramatic effect that traveling transposon DNA can have on the creation of genes and provide a glimpse into some of the forces that shaped the genome of one of the most ancient and mysterious organisms.
Read the full story here.
(*Mol Biol Evol* 2021, doi:10.1093/molbev/msab007)

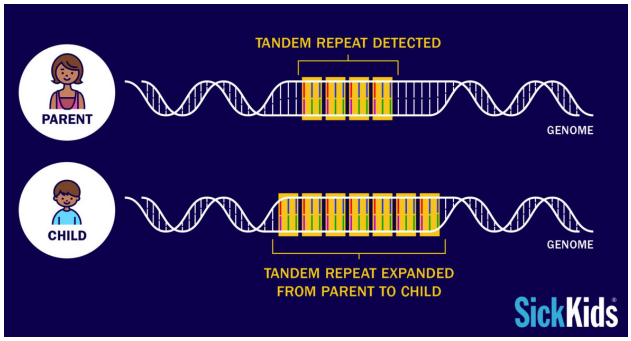


Structural insights into the tropism of human adenoviruses.
The fastidious enteric adenoviruses, types 40 and 41, stand out among human adenoviruses as important pathogens that cause diarrhea in infants and young children but, unlike other human adenoviruses, do not cause disease elsewhere in the body. In contrast, other human adenoviruses which can infect multiple tissues rarely cause diarrhea. Experiments in **Dr. Martha Brown's** lab showed that sequential exposure of enteric HAdV-F41 to gastric and then intestinal conditions actually enhanced infectivity, suggesting structural differences in features of the capsid influence its tropism. Despite HAdV-F41 being a challenge to amplify in cell culture, sufficient amounts were produced in the Brown lab for high-resolution structural analysis by cryo-EM in the lab of **Dr. Carmen San Martin, Madrid**, which was recently published in *Science Advances*. Indeed, structural differences were identified between the enteric HAdV-F41 and non-enteric types 5 (HAdV-C5) and 26 (HAdV-D26). An unexpected finding was the unique structure of the external stabilizing protein IX in the enteric HAdV-F41, different than that in any human or animal adenoviruses studied to date. Further experiments are anticipated to compare the structure of enteric HAdV-F41 before and after exposure to gastric conditions.
(*Science Advances* 2021, doi: 10.1126/sciadv.abd9421)

Why are some cancers good at evading destruction by the host immune system?
A study led by **Dr. Jason Moffat**, and published in *Nature*, has examined the genetic circuits that allow cancer cells to

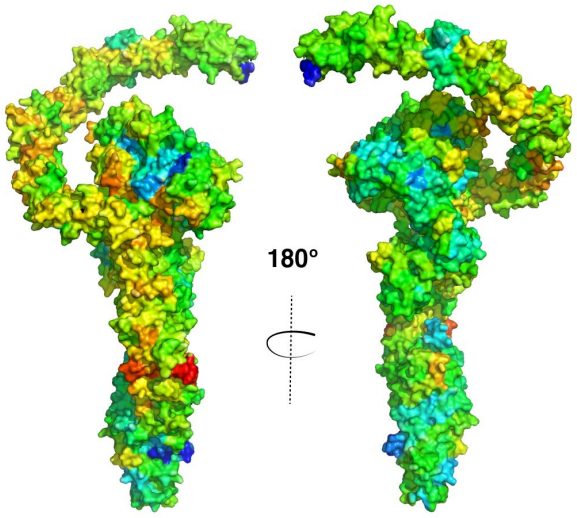


evade the immune system. The research team performed genome-wide CRISPR screens across a panel of diverse mouse cancer cell lines that were cultured in the presence of cytotoxic T lymphocytes, which are killer T cells of the immune system. They identified 182 genes whose deletion makes the cells either more sensitive or more resistant to T cell attack. The effects varied with genetic context; that is, depended on the genetic makeup of the cancer cell, highlighting the genetic interactions that contribute to phenotypes associated with escape from killing by T cells. The results will aid development of cancer immunotherapies that are tailored to specific cancers and the mutations that contribute to their progression.
Read the full story here.
(*Nature* 2020, doi: 10.1038/s41586-020-2746-2)



DNA tandem repeats: a novel link to autism.
Autism Spectrum Disorder (ASD) is associated with different genetic changes, but our understanding of the nature of these changes is incomplete. A research team in SickKids led by **Dr. Ryan Yuen** has discovered that expansion of tandem DNA repeats in human genomes is more prevalent among individuals with autism than those who are unaffected, suggesting that repeat expansions are a risk factor for autism spectrum disorder (ASD) and contribute to its complexity. The research team included **Dr. Stephen Scherer** and **Dr. Christopher Pearson**, also MoGen faculty. The study, published in *Nature*, examined tandem repeats throughout the entire human genome, and also found, for example, that there is wider sequence variability among repeat expansions than had been previously thought. The team's genome-wide experimental approach is a model that could also be applied to the understanding of other genetic disorders.
Click here to read more.
(*Nature* 2020, doi: 10.1038/s41586-020-2579-z)

How pathogens evolve to



change their target specificity is a fascinating problem, and is particularly relevant as the coronovirus evolves during the current pandemic.

A study co-led by **Dr. Mikko Taipale** has found that two almost identical bacterial toxins cause distinct illnesses—diarrhea and fatal toxic shock syndrome—by binding unrelated human receptors to infect different organs. The work, which was published in *Cell*, was co-led by Drs. Roman Melnyk and Jean-Philippe Julien (Dept Biochemistry). Two bacterial pathogens, *Clostridium difficile*, and a close relative, *Paeniclostridium sordellii*, encode very similar toxins but with completely different protein targets. The reason for this is a tiny part of the toxins that differs considerably between *C. difficile* and *P. sordellii*. Found in the middle of the toxin, it forms a surface by which both toxins contact their receptors, as revealed by cryo electron microscopy, which allows a detailed three-dimensional view of molecular structure. It appears that while the rest of the toxin is under strong evolutionary pressure to remain unchanged, the receptor-binding surface is free from such constraints. This can allow toxins to evolve into variants that can bind new receptors to invade other tissues and hosts.

Read the full story here.

(*Cell* 2020, doi: 10.1016/j.cell.2020.06.005)

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Faculty Highlights and Awards

Welcome Stacy Hewson, MSc, MS, CCGC, CGC, as the new Director of the Genetic Counselling Program! Stacy is an Assistant Professor in the Department and assumed the position of Program Director in October 2020. Stacy brings a strong vision and passion to this new role. During her 20-year career as a Genetic Counsellor at SickKids, Stacy has developed a collaborative and professional approach fitting with a "lead from behind" philosophy. Stacy is a national leader in the field of Genetic Counselling, especially in the area of metabolic genetic disorders.

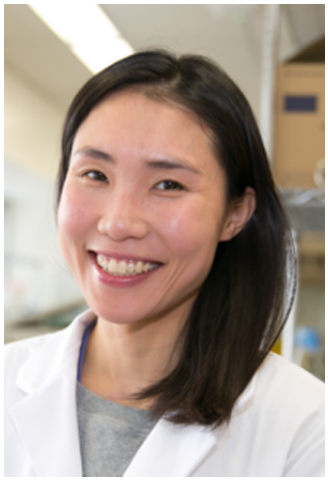
Welcome to New Faculty

Dr. Hartland Jackson is an Investigator at LTRI and Associate Scientist in OICR. He joined the Department as an Assistant Professor in July 2020. He completed his PhD in Medical Biophysics at U of T, and his postdoctoral training in Quantitative Biomedicine at the University of Zurich. Research in the Jackson lab involves the use of mass cytometry for highly multiplexed imaging of tumour tissues, and the development of methods for the analysis of spatially resolved single cell data.

Dr. Brian Kalish is a Neonatologist and Scientist-Track Investigator at the SickKids Research Institute, and joined the Department as an Assistant Professor in January 2021. He received his MD and did his postdoctoral training at Harvard Medical School. His research program seeks to understand how pregnancy and early life experience shapes neurodevelopment and plasticity. The Kalish lab leverages cutting-edge molecular neuroscience and genomics to address fundamental questions at the intersection of neurodevelopment and reproductive biology.

Dr. Rafael Montenegro Burke joined the Department as an Assistant Professor in September 2020, in the Donnelly Centre for Cellular & Biomolecular Research. He trained at Vanderbilt University for his PhD, and at the Scripps Research Institute in California for postdoctoral work. His lab studies global metabolic changes and maps new metabolites in different pathways using mass spectrometry and bioinformatic methods. His research focuses on the development of strategies for novel metabolite characterization, and their impact on cell function, in health and disease.

Dr. Jüri Reimand is an Investigator at the Ontario Institute for Cancer Research (OICR), and joined the Department as an Assistant Professor in March 2020. He completed his PhD in computer science at the University of Tartu, and his postdoctoral training at the Donnelly Centre with Gary Bader. His lab focuses on computational biology and cancer research; they design statistical and machine-learning methods to analyze complex multi-omics datasets of many cancer types. The goal is to discover driver mechanisms of disease, pathways and networks, and innovative biomarkers by jointly analyzing datasets through the central dogma of molecular biology.



Dr. Ji-Young Youn is a Scientist in the Molecular Medicine Program at the SickKids Research Institute. She joined the Department as an Assistant Professor in July 2020. Ji-Young is a MoGen alumna; she received her PhD with Brenda Andrews at the Donnelly Centre and did postdoctoral training with Anne-Claude Gingras at LTRI. Her lab studies biomolecular condensates that organize subcellular systems and govern their ability to deal with stress. Using proteomics, genomics, and cell biological tools, her team investigates their organization, dynamics, and function. This work provides novel strategies to understand and treat neurodegenerative disorders, cancer and infectious diseases.

Honours and Awards

The **U.S. National Academy of Sciences** elected **Dr. Brenda Andrews** and **Dr. Lewis Kay** as international members in 2020. They were two of just 26 scientists to receive the recognition, joining a total of 501 scientists from countries outside the U.S. Dr. Andrews, a University Professor, is

Brenda Andrews Lewis Kay

a Professor in Molecular Genetics, and former and founding Director of the Donnelly Centre for Cellular and Biomolecular Research. Dr. Kay, a University Professor, is Professor of Molecular Genetics, Chemistry and Biochemistry at U of T, and a senior scientist at SickKids Research Institute. Established in 1863, the NAS provides advice on science and technology to the United States and globally and its members rank among the world's most accomplished scientists.

Dr. Anne-Claude Gingras has been elected an **EMBO Associate Member in 2020**, in recognition of her remarkable achievements in Life Sciences. Work in the Gingras lab develops and applies experimental and computational proteomics approaches for the discovery of protein-protein interactions and subcellular organization in vertebrates.

EMBO is an organization of more than 1800 leading researchers that promotes excellence in the life sciences in Europe and beyond. The major goals of the organization are to support talented researchers at all stages of their careers, stimulate the exchange of scientific information, and help build a research environment where scientists can achieve their best work.

Read the full EMBO announcement here.

Dr. John Dick has been elected to the **National Academy of Medicine (NAM)**, which is one of three academies that comprise the National Academies of Sciences, Engineering, and Medicine in the United States. John is globally recognized for his discovery of and study of leukemia stem cells, contributions that have helped shape the understanding of cancer and reveal new strategies for curing the disease.

Dr. Leah Cowen has been elected a **Fellow of the American Association for the Advancement of Science** (AAAS). She was recognized for "distinguished contributions in the field of microbial genomics, particularly for using functional and chemical genomic analyses to identify vulnerabilities in fungal pathogens". AAAS Fellows are elected each year to recognize important contributions to STEM disciplines, including pioneering research, leadership within a given field, teaching and mentoring, fostering collaborations, and advancing public understanding of science.
Read the full announcement by AAAS here.

Dr. Howard Lipshitz has been appointed the new **Editor in Chief** of ***Genetics***, the flagship journal of the Genetics Society of America, effective January 2021. Howard is a Professor and former Chair of the Department, where his current research focuses on post-transcriptional regulation of gene expression in *Drosophila*. A Fellow of the AAAS, he has served on the board of directors of the Society for Developmental Biology, on the North American Drosophila Board, and as one of the founders of the Rare Diseases: Models and Mechanisms Network (Canada).
Click here to read the full announcement.

Dr. Scott Gray-Owen has received a **Minister of College and Universities' Award of Excellence** for his extraordinary contributions to the COVID-19 response in Ontario. The Gray-Owen lab used the CL3 high-tech containment lab to test the efficacy of an antimicrobial coating for face masks developed by Quebec company I3 BioMedical Inc. He found the coating deactivated more than 99 per cent of the virus that causes COVID-19 within minutes, greatly reducing the risk that health-care workers could be exposed to the virus by touching and adjusting their masks.
See the full announcement here.

James Ellis

Stephen Scherer

Two MoGen Faculty, **Dr. James Ellis** and **Dr. Stephen Scherer**, alongside SickKids researchers Dr. Seema Mital, Dr. Binita Kamath, Dr. Norman Rosenblum and Dr. Steve Prescott, are winners of the **Janet Rossant Research Innovation Prize in 2020**. The team were honoured for their work generating a high-quality resource of versatile induced pluripotent stem cell (iPSC) lines for use in disease modeling studies, which was published in *Stem Cell Reports*. Collaborators from UofT were Dr. Michael Szego (also MoGen faculty), Dr. Michele Anderson and Dr. J.C. Zuniga-Pflucker.
The Janet Rossant Research Innovation Prize was launched in 2018, and is awarded annually to two or more SickKids researchers in recognition of a collaborative, interdisciplinary, cross-cutting research endeavour. It is named in honour of Dr. Janet Rossant, Senior Scientist and Emeritus Chief of Research of SickKids and Professor of Molecular Genetics.

The Association of Genetic Counseling Program Directors (AGCPD) annual *Outstanding Supervisor Award* recognizes one outstanding clinical supervisor from each genetic counselling program. The 2020 winner for the University of Toronto is **Ioana Miron**, who is Associate Faculty in the Genetic Counseling Program and also an alumna. Each graduating student can nominate one supervisor who has demonstrated excellence in one or more of the domains of the genetic counseling supervision competencies. Examples of these competencies include relationship building and maintenance, student evaluation, student centered supervision, guidance and monitoring of patient care, and the ethical and legal aspects of supervision. Winners of the award are honored by both the AGCPD and the National Society of Genetic Counselors (NSGC).

Canada Research Chairs

Four Molecular Genetics faculty are 2020 recipients of Canada Research Chairs:

Dr. Kieran Campbell - *Tier 2 Canada Research Chair in Machine Learning in Translational Biomedicine*. His research focusses on Bayesian models and machine learning for high dimensional biomedical data, including single-cell and cancer genomics.

Dr. Timothy Hughes - *Tier 1 Canada Research Chair in Decoding Gene Regulation*. His research examines how eukaryotic cells recognize and interpret the information in the genome, by studying protein-DNA and protein-RNA sequence specificity.

Dr. Hartland Jackson - *Tier 2 Canada Research Chair in Systems Pathology*. Research in the Jackson lab involves the use of mass cytometry for highly multiplexed imaging of tumour tissues, and the development of methods for the analysis of spatially resolved single cell data.

Dr. Julie Lefebvre - *Tier 2 Canada Research Chair in Developmental Neural Circuitry*. Her research examines how developing neurons precisely organize into neural

circuits, and studies molecular and cellular mechanisms that specify neuronal wiring patterns and partners.

In Memoriam

Emeritus Professor Marvin Gold passed away in October, 2020. Marv received his Ph.D. in Medical Biophysics at the University of Toronto and then began a phenomenally productive Fellowship during the early 1960s in the lab of Jerry Hurwitz at New York University and later at the Albert Einstein College of Medicine. There he made his first of several groundbreaking discoveries, namely he discovered DNA methylases. He correctly predicted their importance in restriction-modification, gene regulation and DNA repair. In 1967 he returned to Toronto where Lou Siminovitch was forming the Department of Medical Cell Biology (later to become Molecular Genetics). Marvin was the last of the original members of that department, headquartered at the Medical Sciences Building, to retire.

Marvin's research after moving to the University of Toronto centred on the mechanisms of packaging of the DNA of bacteriophage lambda into the phage head. He and Andy Becker spent a good part of their lives in the cold room purifying the terminase enzyme that catalyzed the cleavage and packaging reactions. Not only did this yield important fundamental insights into how viruses are made but it also led to the extremely useful system by which large pieces of DNA could be cloned. Indeed, many important disease genes were cloned using the lambda packaging system.

As a scientist, Marv loved enzymes; purifying, assaying, and figuring out how they worked. He was always happy when he had 10 kg of *E. coli* cells that needed to be "blasted" into a lysate and then fractionated. Marv was an enthusiastic supervisor who enjoyed walking around the lab looking at gels and plates full of phage plaques. He and Andy Becker were close collaborators and friends who could often be seen in deep conversation in front of the big windows in the West Wing of the MSB.

Besides science, Marv was a reknowned authority on contemporary classical music and avidly collected albums in this genre. One could often hear him negotiating album trades on the phone in his office. Marv was also a life-long baseball fan and listened to all the afternoon Blue Jays games on the very old AM transistor radio in his office. When baseball wasn't on, the CBC could always be heard quietly in the background. Finally, Marv was a scholar of Judaism and could provide a fascinating explanation and discussion of even the most arcane points of observance. Whether it was science, baseball, or religion, Marv pursued all of his interests with the same scholarly rigour and passion for truth. Marv was an academic through and through, and it was this quality that inspired his students and colleagues most of all. [*contributed by Alan Davidson*]

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Trainee Highlights and Awards

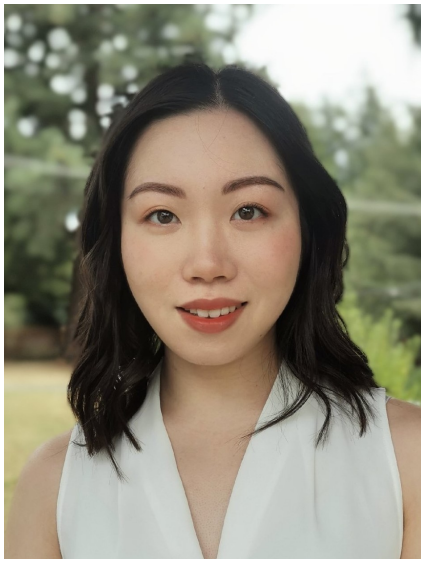
Jhenielle Campbell

Madeline Beer

Jhenielle Campbell and **Madeline Beer** are the inaugural recipients of the **David Dime Family Catalyst Fund - Catalyzing the Talent Pipeline Scholarships**. This newly established scholarship is generously supported by the family of the late Dr. David Dime. David had a rich history at the University of Toronto, with a PhD from the Department of Chemistry, followed by a job in industry in Switzerland, and then postdoctoral research in the Department of Molecular Genetics. David was the founder of Toronto Research Chemicals, which he started in 1983 in a small space on the 4th floor of Medical Sciences Building. Together with his wife, Elisa Nuyten, and his children, Julian, Sophia, and Camille Dime, he established this Catalyst Fund to support innovative and exploratory research and training in the Department of Molecular Genetics.

The objective of the Catalyzing the Talent Pipeline Scholarship is to engage and support young, brilliant scientists to enable them to pursue careers in fundamental and basic research. These scholarships specifically aim to support young graduate students in the Department of Molecular Genetics who come from backgrounds that are underrepresented in basic biomolecular research.

Jhenielle has joined the Navarre lab, and Madeline has joined the Claycomb lab, for their graduate studies in Molecular Genetics.



Nicole Liang has been awarded the **The Jane Engelberg Memorial Fellowship** for her project: “Next Generation Sequencing-based Newborn Screening: Parental Preferences for Identifiable Target Conditions”. Nicole is a 2nd year MSc student in the Genetic Counselling Program. The Jane Engelberg Memorial Fellowship (JEMF), established in 1991 as a highly prestigious award of the National Society of Genetic Counselors. The objectives of the JEMF are to promote the professional development of individual counselors and to improve the practice of genetic counseling by providing support for the scholarly investigation of any aspect of the profession. Such investigation is essential as the profession responds to changes in genetics, health care, and the ethical, legal, and social dimensions of genetic medicine.

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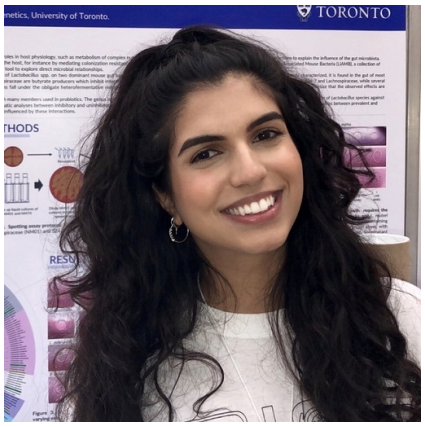
Graduate Student Awards 2020

Molecular Genetics has a number of competitive awards and fellowships given annually to our graduate students and announced at the retreat. Congratulations to all students!!

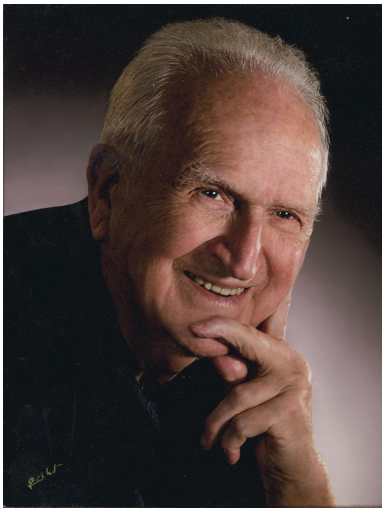
L.W. MacPherson Award
Kali Iyer
(Cowen lab)



Roman Pakula Award
Danica Chaharlangi
(Navarre lab)

Norman Bethune Award
Francesco Zangari
(Gingras lab)

Eric Hani Fellowship
Nicola Case
(Cowen lab)



New Graduate Award, starting 2021, to honour Dr. Lou Siminovitch.

The Department is pleased to announce a new annual award for graduate students in Molecular Genetics. **The Dr. Louis Siminovitch Catalyst Award** has been established in honour of Dr. Lou Siminovitch, who founded our Department in 1969 under the name of Medical Cell Biology. The award aims to inspire and support the next generation of scientific thought leaders who will lead the way toward transformative discoveries in genetics over the next 50 years and beyond, recognizing the importance of mentorship in enabling scientific careers.

Dr. Siminovitch has mentored and trained generations of young scientists, inspiring research excellence and has been an influential force in Canadian biomedical science. The application process for the award will be posted in the summer and the winner announced at the Departmental Retreat.

See the full announcement here.

Undergraduate Student Awards 2020

Jack Daiyang Li, an MGY Specialist, was awarded the **2020 Clarence Fuerst/DTL Award** as the best student in the MGY

Genetics lab courses, MGY314 and MGY315. The award comes with a certificate and cheque for $250. It is administered by the Division of Teaching Labs (DTL) in the Temerty Faculty of Medicine, and is given to honour the late Dr. Clarence Fuerst. Clarence was a lambda geneticist, recruited by Lou Siminovitch to the Department, and was responsible for setting up our original lab course experiments in the (then) MGB program.

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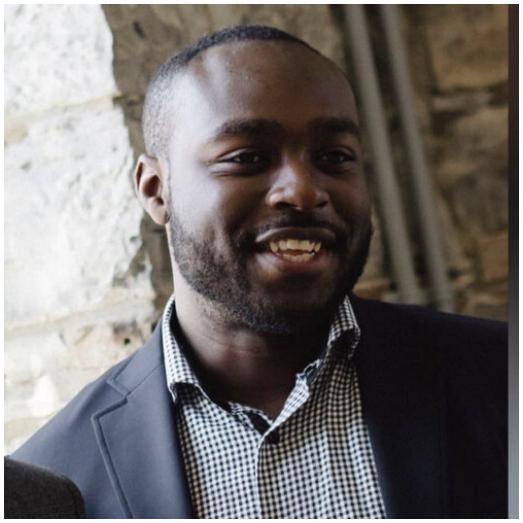
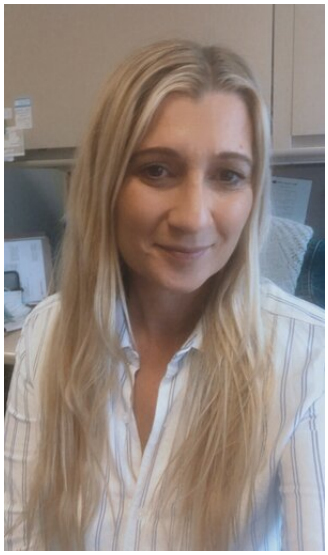
Staff Highlights and Awards



Kwame Diko has been awarded a **Staff Impact Award in the Temerty Faculty of Medicine.** Kwame joined our administrative team as Student Services Assistant in November 2019. He received the **2020 New Employee Award** in recognition of his outstanding contributions in supporting students and faculty to overcome the challenges associated with remote learning. Shortly after starting in his role, he quickly engaged with the department's community and demonstrated innovation and initiative in responding to the high volume of curriculum inquiries in a timely manner and improving communication with students. The Student Services portfolio includes administration of the MGY undergraduate programs, Summer Undergraduate Research Program, Communications, and Teaching Assistants.



We welcome Maggie Stevanovic to the Genetic Counselling Program, as Educational coordinator/Program administrator, effective Sept 8, 2020. Previously she was the Continuing Education and Conference Coordinator in the Division of Paediatric Emergency Medicine at SickKids. Over the past 13 years, Maggie has coordinated the annual PEM conference as well as workshops on Advanced Paediatric Life Support, Emergency Procedural Sedation, and Emergency Procedures. Her experience with virtual learning, website and event planning will be an asset to the position.

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Please visit the following links for COVID-19 resources and updates:
University of Toronto
Temerty Faculty of Medicine

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Links to previous editions of MoGeNews

To access previous issues of MoGeNews, please click on the following links:

Issue 14

Issue 13

Issue 12

Issue 11

Issue 10

See Issue 14 for links to all earlier newsletters (Issues 1 to 13)

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