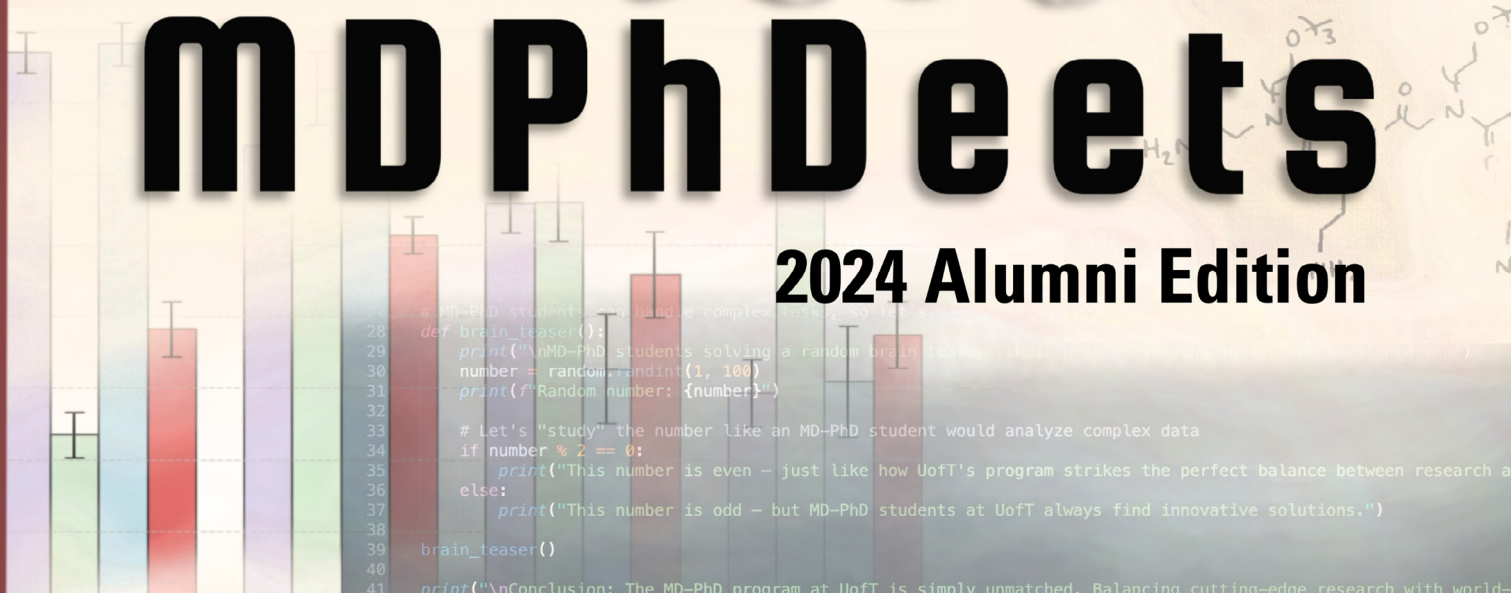


U o f T

mDPhDeets

2024 Alumni Edition



Category 2
neurogenesis - along T₁-T₄

Category 3
neurogenesis - along T₅-T₁₂

* Sympathetic postganglionic T₁-T₄

splanchnic nerve!

Message from Dr. Nicola Jones, Director, Physician Scientist Training Programs



Dear Alumni,

I am delighted to welcome you to our latest MD-PhDeets newsletter – the Class Council student-led information initiative. As the Director of the Physician Scientist Training Programs, it is my pleasure to share with you the remarkable progress and achievements of our programs over the years.

This newsletter feature stories on our work and people, who are shaping the future of medicine and health care and our plans for future growth, as the largest national program of its kind, that trains and mentors the next generation of physician scientists.

Since the inception of our MD/PhD Program in 1984, the first of its kind in Canada, we have grown from a small cohort of two to three students per year to the largest MD/PhD Program in Canada, now enrolling approximately 70 students annually. This growth reflects our unwavering commitment to training the next generation of clinician scientists who are adept in both medical practice and scientific research.

We are in an exciting time for clinician scientist trainees at the Temerty Faculty of Medicine. This academic year, we welcomed our new Dean, Dr. Lisa Robinson. Training the next generation of physician scientists continues to be a major focus for the Temerty Faculty of Medicine and is one of the Dean's strategic priorities.

The breadth of research our learners are engaged in is remarkable and reflects the University of Toronto as a global leader in health research and innovation. We have expanded our curriculum and skill development programs to support the growing skill set required for navigating a changing landscape including the launch of a new physician scientist mentorship program engaging both early career researchers, MD PhD students and Clinician Investigator trainees, to create a tangible impact at Temerty Medicine and beyond.

We continue to tackle the barriers for physician scientists and one way we are doing this is through a pilot initiative that is under development to provide an accelerated residency research stream to address length of training and to promote a continuous track for physician scientist training at Temerty Medicine. We continue to elevate our existing CREMS, GDipHR and CIP programming by creating more onramps to these learning opportunities and intersections for career-building amongst our learners.

Our graduates continue to distinguish themselves in various medical and surgical specialties, holding prestigious academic positions at universities and research institutions worldwide. Your contributions to medical science and patient care continue to inspire and drive our mission forward.

As we look to the future, we remain dedicated to providing unparalleled financial, career, and academic support to our students. Our goal is to ensure that they are well-equipped to tackle the complex challenges of modern medicine and make significant contributions to the advancement of healthcare.

Thank you for your continued support and engagement with our programs. Together, we will continue to foster a community of excellence and innovation. 🐦

Message from the MD-PhD Class Co-Presidents

Andrew Mazzanti and Safa Majeed

Welcome to the newest edition of MDPhDeets! We are excited to see how our revamped newsletter has flourished and brought together the MD-PhD program thanks to the amazing leadership of Erica Wennberg, Angela Zhou, Jasmine Ryu Won Kang, and Anita Hu. The MD-PhD class co-presidents have overlapping terms, meaning Andrew is in his 2nd year as co-president and Safa in her 1st. We are a dynamic duo of colleagues turned friends turned co-presidents, and we wanted to take this opportunity to share with you all some of the updates and visions we have for the years ahead.

Firstly, we recently completed a Constitution review which, although it may seem boring, proved how efficient and dedicated our Class Council is. Most notably, we introduced the new position of Vice-President Systems Advancement. This role will help to focus the Council's energy on specific areas of improvement, and represents a recommitment of energy, attention, and resources to making this program better and more inclusive.

Secondly, we introduced a student-led award called the MD-PhD Changemaker Award. This award recognizes the actions of one or a few students who took concrete action to improve the MD-PhD program and community. Nominations, voting, and awards are handled by the student body, making it an award by the students and for the students. The inaugural recipients of the Changemaker Award were Falan Bennett and Allysia Chin for their work initiating changes to the MD-PhD stipend schedule and structure that have improved our program's accessibility and harmonized our base funding from September of Year 1 forward.

Our visions for the year are many. We are pursuing ways to improve family planning support available to MD-PhD trainees. The first step involved launching a study of the family planning needs of MD-PhD students nationwide, in collaboration with Dr. Nicola Jones and other investigators at the Temerty Faculty of Medicine. We hope this study will generate actionable data to improve our program and MD-PhD programs internationally.

Our biannual retreat is a time-honoured tradition that combines scientific discussion, group mentoring, and quality time to produce strong connections between MD-PhD students. This year, our retreat was expertly designed by Anita Hu and Jonathan Monteiro, and was a memorable weekend. Because the retreat is biannual, we as presidents are looking for new ways to bring the class together at the start of the academic year on retreat "off" years to further promote positive, collegial connections between all students in the program.

We also believe that a shortcoming in recent years has been our lack of direct outreach to undergraduate students. Made more difficult by the COVID19 pandemic, we're hoping to increase our in-person outreach efforts to lower the barrier of entry to our amazing program.

The biweekly MD-PhD seminar is the lifeblood of the program during which our students present their research, complete workshops to advance in the MD-PhD curriculum, and come together to convene with friends and colleagues. This year promises one of the most diverse seminar line-ups, designed by us in response to our first-ever Academic Town Hall in June 2024. This year's workshops and seminars will include topics such as financial literacy, the use of AI in research, elevator pitches, and more personal seminars from physician-scientists about their career trajectories.

We hope the legacy of this co-presidency will be our willingness to keep alive our program's favourite traditions, our fearlessness in creating new traditions, and our responsiveness to the needs of our peers. Hopefully we've made some progress on all those fronts, but we're always looking to improve and do the best job we can. We both look forward to the next year working with our Class Council, and with the MD-PhD program student body at large. 🐦🌿

Toronto to host the 2025 CSCI-CITAC Annual Joint Meeting!

This spring, the Annual Joint Meeting between the Canadian Society for Clinical Investigation and the Clinician Investigator Trainee Association of Canada will be hosted in Toronto in collaboration with the Integrated Physician Scientist Training Programs at the University of Toronto from April 9th to 10th at the beautiful DoubleTree by Hilton Hotel. This national level meeting brings together clinician-scientist trainees in Clinician Investigator Programs, MD-PhD programs, and MD-MSc programs across Canada for an action packed conference which includes two days of poster and selected oral presentations, career development workshops, mentorship, as well as networking and social opportunities. We are also excited to share that new for this AJM, there will be sessions focused on the use of artificial intelligence in healthcare and research, as well as the importance on involving patient partners in research programs. The AJM is the largest meeting of its kind in the country and has not been hosted in Toronto since 2018! Abstract submissions and registration are now open. See right for some images of UofT MD-PhD at last year's AJM in Vancouver!



Above and below: Mathepan, Nicola, Robert, Saim, Prajay, and Gemma at the 2024 AJM in Vancouver



Launch of the Integrated Physician Scientist Mentorship Academy

This fall, the MD/PhD program and Clinician Investigator Programs within the Temerty Faculty of Medicine saw the launch of the new Integrated Physician Scientist Training Program (IPSTP) mentorship academy. This program is designed to foster meaningful relationships between trainees and faculty throughout physician-scientist training. The program recognizes the unique challenges faced by physician scientists and aims to address the need for diverse mentoring relationships.

The mentorship program pairs trainees with experienced faculty mentors who can guide them in their medical, clinical, and research pursuits. Participants will engage in regular meetings, workshops, and group discussions to facilitate knowledge exchange and networking. The goal is to create a supportive environment where both mentors and mentees can thrive, fostering professional relationships that last well beyond the program's duration.

Through structured interactions within mentorship “pods”, participants will have the opportunity to learn from each other's experiences, share insights, and collaborate on various endeavors. This initiative not only supports individual development

but also strengthens the collective mission to provide support and mentorship in academic medicine.

The kickoff event on September 24th was a resounding success, setting the stage for a vibrant community of learning and growth.

As we move forward, we encourage all interested physician scientists to get involved. Whether you

are a trainee seeking guidance or a faculty member looking to share your expertise, this program offers an invaluable opportunity to connect. Stay tuned for more updates! 🐦

Content

Message from the Director - page 1	Interview with Temerty Dean Lisa Robinson - pages 11-12
Message from the co-presidents - page 2	A reflection on the MD-PhD community - pages 13-14
CSCI-CITAC Annual Joint Meeting - page 3	MOments in Mentorship - pages 15-18
Integrated Physician Scientist Mentorship Academy - pages 3-4	Where are they now? - pages 19-20
Passing the MD-PhD Program Manager baton - pages 5-6	MD-PhD seminar spotlights - pages 21-27
MD-PhD fall retreat 2024 - pages 7-8	Awards - page 28
MD-PhD graduation - pages 9-10	Publications - pages 29-30

Newsletter Team & Credits

Editors: Angela Zhou and Erica Wennberg (2023-2024); Anita Hu and Jasmine Kang (2024-2025)
Newsletter Committee: Alex Bailey, Andrew Mazzanti, Anglin Dent, Camilla Giovino, Ryan Karimi, Safa Majeed
Cover Design: Anita Hu

Passing the MD-PhD Program Manager Baton: A Cherished Goodbye to Kendra and Warm Welcome to Andrew

This past spring, the MD-PhD Program bid farewell to Kendra Hawke, our Program Manager of 10 years! Kendra played a fundamental role in advocating for students' wellbeing, keeping track of our academic progress, ensuring timely and accurate stipend payments, and reviewing all student applications during each year's admissions cycle. As we bid farewell to Kendra, she had a final message to share with the MD-PhD community:

"The path to medical school often emphasizes perfection: a flawless GPA, impeccable references, and an impeccable CV. Next is the chase of the perfect specialty and the best residency. However, the truth in both clinical practice and research is that you are ultimately striving for the best possible outcome for your patients or projects – not perfection. Real life is messy and imperfect. So, grant yourself the same grace you extend to others and simply aim to do your best. It won't always be perfect, but it will always be enough."

Thank you, Kendra, for your dedication to student affairs!



Photos from Kendra's farewell celebration in April 2024

Now, we welcome our new MD-PhD Program Manager, Andrew McLeod, who has a track record of administrative leadership in the healthcare sector. For nearly 20 years, he worked at St. Michael's Hospital in both in-patient and out-patient settings, as well as in the senior leadership office of VP Education. In 2018, he joined as staff at Temerty Medicine and became Executive Assistant in 2021 with the newly created Office of the Vice Dean, Medical Education. It was in this role that Andrew was responsible for the planning and implementation of the human resource, financial and space needs of the Medical Education portfolio and office.



In his first few months as Program Manager, we asked Andrew some questions to get to know more about him!

What has been your favourite part about managing our MD/PhD program?

My favorite parts include the new challenges with taking on a new role, the continuous learning experience, and working with a community of extremely bright and engaged learners. There is a real sense of community within the MD/PhD Program which is great to be a part of!

What do you see for the future of the MD/PhD program?

I hope to continue building upon and strengthening our physician scientist training programs at the University of Toronto and increase their integration across all levels of education. Working with leadership and partners to generate support for targeted growth of the MD-PhD program is a goal of mine, and continuing efforts to enhance the diversity and inclusion within the program.

What do you enjoy doing in your free time? Do you have any pets?

Free time includes travelling, spending time with my family, my partner and our two dogs (Gizmo and Cody) and spending long weekends at our cottage over the summer!

Any other fun facts about yourself?

I have a major sweet tooth for anything chocolate or gummies!

Welcome to the MD-PhD community, Andrew! 🐾🐦

MD-PhD Fall Retreat 2024: A Wifi-less Weekend of Collaborative Science

Written by: Anita Hu

The MD-PhD program retreat took place this September in a cozy retreat centre in Mono, ON! With the retreat theme being Nature Communications (inspired by the scientific journal itself), students engaged in collaborative workshops and team-building activities that strengthened our communication skills and our MD-PhD student community—all while being immersed in the peace and calm of the forest around us.



The weekend was filled with meaningful discussions, creative problem-solving, and the kinds of innovative collaborations that remind us why we chose this path. Students engaged in peer mentorship workshops, tackling personal challenges they have been facing, sharing insights, and developing new approaches to problem-solving.

One of the retreat's standout moments was the Dragon's Den-style pitch competition, where students from different research backgrounds had just 3 minutes to propose a new research project combining all their knowledge. It was amazing to see how different fields came together, with each presentation uniquely blending basic science, clinical medicine, engineering, and more into compelling healthcare solutions.

We were also fortunate to host a keynote presentation by Dr. Jim Dowling, a pediatric neurologist and clinician-scientist, who shared his inspiring work administering a novel gene therapy for SPG50, a rare neurodegenerative disorder, to a young boy. His talk was powerful and moving, offering a deep reflection on his journey in medicine and research. Dr. Dowling's lecture left us all feeling motivated and inspired to continue pushing the boundaries of our own work, knowing that great things happen when passion meets purpose.

A special thank you goes out to Dr. Nicola Jones for her unwavering support and for stepping up with Dr. Dowling as a judge during the pitch competition. And of course, her HOT-TO-GO dance by the campfire was a showstopper—thank you for bringing such fun and positive energy to the retreat!

Also, thank you to our MD-PhD program manager, Andrew McLeod, whose behind-the-scenes logistical expertise helped make this retreat possible.

As one of the co-organizers, I am so grateful to everyone who attended and actively engaged in making this retreat such a rewarding experience for everyone. Surviving a wifi-less Saturday (thanks, Bell tower) might have been the unplug we needed from the bustle of our daily academic lives in the city! (Or, it was a burden, and for that, we apologize...)

Lastly, a massive thank you to Jonathan Monteiro, my co-organizer. Thank you for helping bring all the pieces together for this retreat!

Here's to more weekends of learning, growing, and supporting one another as we continue our journey together! 🐦



Opposite: The MD-PhD class, Dr. Jim Dowling, and MD-PhD Program Director Dr. Nicola Jones at the 2024 MD-PhD retreat

Top left: The bonfire on the first night, a retreat tradition!

Clockwise from top right: Photos from the Dragon's Den-style pitch competition at the 2024 retreat (right: winners of the main competition, bottom left: winners of the audience choice competition)



Introducing the Annual MD-PhD Graduation Ceremony and MP Celebration!

In June 2023, we hosted our first ever in-person MD-PhD graduation ceremony and MP celebration at Hart House! This is quickly becoming a favorite yearly tradition for the program. It is a wonderful occasion to celebrate our graduates with family and friends after 7+ years spent in the program, as well as the achievements of MPs, students who have reached the 4-year “midway point” in the program. We hear parting words of wisdom from graduating students, present gifts to the graduating students, and are provided MD-PhD program-themed memes by the MPs. In another new tradition, fifth-year students present the MPs with a midway point gift. Finally, and most importantly, we take pictures with the MD-PhD balloons. We cannot wait to continue the tradition in June 2025! 🐦



*The 2023 MD/PhD graduating class (left to right: Brian, Irene, Sara, Tim, and Sachin; not pictured: Michael, Paymon, and Sydney) with Kendra and Nicola at the June 2023 graduation ceremony.
Photo credit: Alex Florescu*



*The 2024 MD/PhD graduating class (left to right: Sivakami, Glenn, and Jill; not pictured: Gavin, Danielle, Kramay, and Anum) with Nicola and Kendra at the June 2024 graduation ceremony.
Photo credit: Vince Wu*



Above: The 2023 MPs (left to right: Mitch, Camilla, Pam, Hillary, Bill, Jenn, and Andrew) with Kendra and Nicola at the June 2023 graduation ceremony.

Photo credit: Alex Florescu

Right: Presentation of graduation and MP gifts at the June 2024 ceremony

Photo credit: Vince Wu

Below: The 2024 MPs (left to right: Robert, Mathepan, Safa, Vienna, and Emerson; not pictured: Yun) with Kendra and Nicola at the June 2024 graduation ceremony

Photo credit: Vince Wu



Dr. Lisa Robinson's vision for physician-scientist training at the Temerty Faculty of Medicine

Interview by: Jasmine Kang

The Newsletter team was fortunate enough to have a chance to ask Dr. Lisa Robinson, Dean of the Temerty Faculty of Medicine, some overarching questions about her goals and vision for the MD/PhD program and physician-scientist training more generally.



Broadly, what are your goals and priorities as they relate to physician-scientist training at the Temerty Faculty of Medicine?

I think overall my main goal is to work collaboratively with Dr. Nicola Jones and other leaders within the MD program, the PGME programs, and our scientific spaces as well, together with students, to think about how we can enhance support for trainees in the physician-scientist training program. So that's not just the MD/PhD program, the CIP program, and other programs - when I'm thinking about support, I'm thinking about sustained and even more robust funding so that we can support the number of trainees enrolled in these programs and the financial resources to try to enhance the experience of students in these programs.

The other thing that I think a lot about is mentorship - the power of mentorship and working really with Dr. Jones and helping her to realize her really important vision around mentorship for students, so that they can connect with trainees who were just ahead of them in the pathway and to physician-scientists in all of our spaces.

What are some of the challenges in physician-scientist training that you envision will be exacerbated over the next 5-10 years, and how can we best address them?

These challenges are very real and as you well know, this is not an easy training program and it's not an easy career. The training program is long and you know it's intensely interesting but sometimes it feels as though it's not an easy program. You're training for careers that

also feel as though that they're uncertain and so even when the training part is done it's hard to imagine what life is going to look like afterwards and what the career will be like as well. The longer training program means, and there's so much evidence around this, that at the time people finish and they're ready to launch their independent careers, they're older than many of their counterparts that they started medical school with and they're ready to launch their independent careers. Then of course there's all the challenges of balancing your professional life and with a family and maybe starting a family. So you know all of those things mean that fewer people are choosing this career and I think we have lots of evidence around that fact as well. There are obviously challenges with respect to grant funding - we know that it's hard to secure funding in a sustainable way, and those challenges aren't getting better, so we need to think creatively about other ways in which we can help to fund people who pursue these careers.

And of course, you know, once you're a clinician-scientist, there are so many challenges with respect to integrating the demands of patient care at the same time as doing research at the top level. Of course, that requires very dedicated time and focused attention, and resources, financial infrastructure, and other types of resources, to allow research to be done in the way that it needs to be done. And so, in terms of solutions, we need to think about how we can smooth the path for people who are pursuing these kinds of careers. That really involves trying to think about how we can streamline the training using some of the tools at our disposal. So, for example, using a competency-based framework as compared to a strictly time-based framework. And of

course, you know, funding is incredibly important and especially at key times. So during transitions, as people are launching their independent careers, we need to make sure we're thinking about ways in which we can use philanthropy and other tools to try to support the work that's being done by brilliant clinician-scientists to allow them to free up their time so that they can really focus on research. And again, I think another incredibly important tool that we need to be thinking about and paying attention to is the power of mentorship.

How can we best streamline communication between the MD and MD/PhD programs? How can we support students during transition periods between graduate studies and medical school?

We do pay a lot of attention to this because this is such an important issue. And Dr. Jones, as the director, and the MD leadership, are always in communication. So they sit at many of the same leadership meetings and the same tables. Dedicated programming and mentorship regarding transitions, not just from the director but also from peers, is needed. We've also developed individual development plans to help with goal-setting, priority-setting, and the practical aspects of transitioning between different phases of training.

How is physician-scientist training at Temerty different from that of other institutions? What sets the program apart?

I am completely biased, but in my view, this program is, you know, one of the best in the world. We are so fortunate here that we have an incredible breadth and depth of excellent science that's being done in all areas of research. We are also incredibly fortunate here in that we have amazing research that's happening across our tri-campus framework, and we are so lucky to be integrated with TAHSN, so the Toronto Academic Health Science Network.

We have some of the best hospitals in the world, and some of the top-performing research institutes in the world. And so it's a little like being a kid in a candy shop here. We are so lucky. We have incredible resources. We also have lots of role models. I think, you know, at

some estimate, we have about 700 clinician-scientists in our spaces. And so all of these are people who can serve as role models, who hopefully can inspire people who are pursuing careers like they are doing.

How has mentorship shaped the legacy of the physician-scientist training programs at UofT? How do alumni stay connected with the MD/PhD program?

Mentorship, as I've said before, is critical. If you don't see it, you don't imagine that you can be it. And it's so important, mentorship in all of its forms. So not just peer-to-peer mentorship, but near-peer mentorship, meaning mentorship from people who are just a little bit further along the path than you are. And then mentorship between faculty and students as well. Again, we are so lucky in that we have many, many clinician-scientists within our spaces who are hungry and eager to act as mentors for the people who are just beside them and who are just following along. And so, you know, this is obviously an important focus of our program here at Temerty Medicine, and there's specific learner-directed programming and also faculty-directed programming. I'm really excited about the new mentorship program that Dr. Jones has just developed to connect learners with each other and also to connect learners with faculty, including the Mentoring Academy.

Taking advantage of the fact that we have people, again, conducting this amazing research, not just across the Tri-Campus, but within our TAHSN and research spaces. But mentorship is critical, not just during the training phase, but also as you're launching your independent career, and I would say throughout your career as well. Just having really smart people who have done this before, thinking about the science that you want to do, and helping to connect you with networks, maybe put you in spaces that you didn't even know exist or that you wouldn't have imagined to connect you with other scientists who can be very important as you develop your ideas and with whom you might want to collaborate as well. So I think the mentorship piece is one of the most important aspects. 🐦

This interview has been edited for clarity.

The friends we made along the way: a reflection on the MD-PhD community

By Natalie Landon-Brace

Early in medical school, we were told that the days are long, but the years are short. Now much closer to the end of the MD-PhD program than the beginning, it is hard to believe that it has been 7 years since I opened my acceptance letter to the program, wondering what this journey would bring and whether I really wanted to sign myself up for 8-10 more years in school. Ultimately, I was persuaded to say yes to the MD-PhD program because of the students I met on interview day – both the upper years who spoke with such enthusiasm for the program and passion for their work, and my fellow interviewees that year who felt like people I belonged with. Since then, I have only become more convinced that the greatest strength of our program lies in our exceptional community, which has shaped me both personally and professionally over the past 7 years.

From the upper years, the most obvious learning came from their practical tips about life in the MD-PhD program. Their guidance was invaluable as I thought about where my clinical interests might lie, selected a research area, and navigated the transitions from medical school to graduate school and back again. More importantly, I learned from them about resilience and how to hold out hope even when nothing was going right in the research world and it felt like graduate school may never end. At the times when I questioned whether I had made the right decision to pursue the program, their example in completing PhDs, matching to their preferred residency, and living full lives outside of academia gave me the confidence to believe that I, too, could figure out how to handle whatever might lie ahead.



From the early year students, I have been more intrigued each year with the breadth of research interests that people are exploring, pushing the boundaries of what it looks like to be an MD-PhD student. I have also learned about who I want to be as a mentor and a leader, as I have tried to pass on the wisdom that I have benefited from and worked to improve the program for students who come after me. I would be remiss not to mention Mohammad, who started the program the year after me and whose tragic passing in 2020 undeniably changed my outlook on life and training. From him, I learned to be bold and unafraid in the pursuit of my goals and to reflect often on the great privilege it is to be in this program and profession. While our gratification as MD-PhD students is often delayed and sacrifices are asked of us, it is essential to find joy on this journey wherever it exists and to live our lives as fully as we can in alignment with what we find most important.



I have been extremely fortunate that my initial interview day suspicions about my future classmates were correct – with them, I have found belonging and friendship that has only grown stronger since our first pre-orientation week dinner. From my own cohort, I have learned how to be brave in making a choice that is right for me even if it is unconventional or pushes into uncharted territory. As clinician-scientist trainees, my peers have shown me how to be creative, resourceful and diligent in the pursuit of excellence. On a personal level, their kindness, open-mindedness, and com-

mitment to improving the lives of those around them, whether as supportive friends or through more formal roles, inspires me to want to be the best version of myself.

My time in the MD-PhD program has brought some of my greatest accomplishments and some of my toughest challenges – a global pandemic was certainly not on the list of experiences I expected to have during my PhD. Nonetheless, I would choose to do it again, if only for the people I have met along the way. Even when the days felt endless, they made the years fly by. 🐦



Above and top left: Natalie and her cohort

MOments in Mentorship:

a mentorship column in memory of Mohammad Asadi Lari

In the December 2023 edition of MDPHDeets, we introduced the MOments in Mentorship column in memory of Mohammad Asadi Lari. The column is focused on honoring Mohammad's legacy of mentorship within and beyond the MD-PhD community. The next four pages feature MOments columns from the December 2023 and June 2024 editions.

by: Gemma Postill

I am honoured to write the first MOments Column. This column was inspired at Mohammad Asadi Lari's memorial seminar in the fall of 2022. The students of the MD/PhD Program voiced the desire to maintain Mohammad's legacy so that incoming students could continue to learn from the legacy that he left on the program. Mohammad received much mentorship from peers, clinician scientist, and professionals in other disciplines. Likewise, Mohammad also generously gave mentorship to peers, always making time for those who needed advice, guidance, and/or support. He was quick to recognize the power and privilege that came from being an MD/PhD student at the University of Toronto.

Through this column, we hope to facilitate conversations on the lessons learned through successes and failures with mentorship, from the perspectives of both mentors and mentees. The training path for a clinician scientist is long; as a result, clinician scientist trainees have many opportunities to learn through mentorship, both as a mentor and as a mentee.

As I reflect on mentorship, a quote my mentor said to me this month comes to mind: "I walked so you can run." My mentor meant this lightheartedly, but the path-paving nature and altruism that this sentence captured resonated deeply with me. The mental image that this quote created encapsulates what mentorship has meant to me recently.



The first two years of the MD/PhD program have felt like a sprint, with much to learn about how medical school and graduate school are structured (and much to learn about myself and the identity I seek to create as a clinician scientist trainee). I have deeply relied on the mentorship of clinician scientists, such as Dr. Nicola Jones, and peers, such as Vinyas Harish. Their mentorship has streamlined the transition by encouraging me to reflect on the type of clinician scientist I want to become and connecting me to the resources needed to do so. Both have leveraged their experiences (successes and struggles) to provide me with tailored advice (e.g., advice specific to me as a person and the situations I find myself in). I would like to take this opportunity to thank them and recognize how their influence has positively informed how I will mentor others.

This week, a high school student I am working on a research project with emailed me, soliciting advice for selecting their undergraduate degree. I paused before responding, reflecting on the many times I have received advice through formal or informal mentorship. The best guidance I have received from Vin or Dr. Jones has occurred when they highlighted the values and goals most pertinent to this decision, guiding the decision rather than solely describing what they would do if it were them.

They connected me to others when they felt I needed external opinions. In that sense, as a mentee, I could begin “running” sooner, having already learned from their experiential knowledge. Responding to the high school student, I did just that. Receiving mentorship, has not only informed the professional decisions I have made, but also how I now mentor others. In that sense, mentorship creates a legacy.

While I never met Mohammad, I am grateful for the legacy that he left on the program. I believe that the energy he devoted to mentorship continues to pay dividends, as each generation of mentees becomes mentors. I hope to continue such a legacy. 🐦

Gemma is in her fourth year of the program. She transitioned from medical to graduate school in July 2023.



MOments in Mentorship: *a mentorship column in memory of Mohammad Asadi Lari*

2024 MD-PhD Mentorship Symposium Summary & Lessons Learned

By Anglin Dent and Bryan Gascon

As our Co-VP Mentorship term on MD-PhD Class Council comes to a close, we feel grateful for the opportunity to reflect on the privilege we have had in strengthening mentorship in our community over the past year. Serving as VPs of Mentorship enabled us to revive and re-imagine key mentorship activities within our program, which ultimately allowed us to embody, even if only partially, the spirit of mentorship that Mo was known for.

The bulk of our role was to plan and execute the MD-PhD Mentorship Symposium, an MD-PhD program tradition that unites faculty and trainees in the spirit of mentorship. Given its biennial nature and pandemic-related closures in recent years, we had the unique privilege of launching the first in-person MD-PhD Mentorship Symposium in 6 years (the last in-person Symposium was held in 2018)! While this enormous undertaking took 6 months of planning - filled with lengthy brainstorming meetings, countless emails to faculty mentors, alumni, and vendors, and physical site visits to several potential venues - we are proud of the results and happy to share a brief summary of the symposium and lessons learned with you!

On the afternoon of March 27th, the MD-PhD community gathered at the beautiful Massey College for an afternoon of connection among current MD-PhD students, MD-PhD alumni, University of Toronto professors, and University of Toronto physician-scientists. We were first joined by our keynote speaker, Dr. Andrea K. Boggild, who enlightened us through her talk “On Becoming & Being a Clinician Scientist”. Over the course of an hour, Dr. Boggild took us through entertaining and insightful stories detailing the highs and lows of the clinician-scientist pathway and drew parallels from her roles as both a scientist and a mother to highlight the importance of resilience and back-up



Bryan and Anglin at the 2024 Mentorship Symposium

plan(s). Dr. Boggild’s keynote stressed the importance of diversity in our research projects and on our research teams, citing Kuheli Dutt to emphasize “the less diverse or inclusive a field, the heavier reliance on stereotypes and implicit biases towards underrepresented groups.” We are so grateful for the profound wisdom and hilarious stories that Dr. Boggild shared with us in her keynote.

Our alumnus speaker was Dr. Alainna J. Jamal, who imparted her survival stories of the MD-PhD program and pearls of wisdom for navigating residency as an MD-PhD graduate. Among her pearls was her perspective on providing and receiving mentorship throughout the MD-PhD journey, which she described as one of the most important determinants of success as a clinician-scientist. While hearing about the multiple avenues through which she has developed mentorship relationships, current MD-PhD students heard about what makes a good mentor, how and where to find scientific mentors, and what exactly mentorship relationships entail (e.g., sharing of resources, generation of opportunities, and advice). We were thrilled to

have Dr. Jamal join us to share her perspective on mentorship and to provide inspiration for the current MD-PhD class navigating this unique pathway.

Lastly, a definite highlight of the mentorship symposium was the 1-1 mentorship pods, where over 15 mentors from the U of T research and medicine community were paired with students based on their research and personal interests, for a 10 minute burst of wisdom sharing and connection building within the community. Student feedback from this activity was phenomenal, with students and mentors describing the pods as opportunities for career advising and scientific brainstorming. We were additionally very proud to have a range of mentors spanning multiple scholarly fields, many of whom were requested specifically by our current students. This event has provided us with many ideas for future networking and mentorship-related activities, which we hope to bring to fruition in the coming year through student council-led initiatives.



1-1 mentorship pods

As we bid farewell to the Bryan-Anglin VP Mentorship duo, we'd like to impart some key insights and lessons learned, related both to this role and mentorship more broadly:

1. Develop an appetite for rejection. The task of ensuring the attendance of a sufficient number of mentors for our mentorship pods was stressful. While 15 symposium mentors may seem impressive, this was only made possible because we sent mentor invitations to approximately 54 U of T faculty and MD-PhD alumni (~28% success rate). More often than not, we were met with a “no thanks” or the classic ghosting phenomenon. Much like any other area of research, embrace rejection and you will eventually succeed!

2. Expand your transferable skill set. Among both our keynote and our alumni talks, the idea of bridging skills from one aspect of your identity to another (e.g., as a scientist, a clinician, or a parent) was emphasized. As we pursue a pathway marked with uncertainty, it is critical to expand our skills to those valuable in both clinical work and research, and inclusive of all fields. Some examples provided by Dr. Jamal included rapid synthesis of information, performing under pressure, persistence, tolerance of failure, and advocacy.

3. “Sometimes, just sometimes, Plans B, C, and D - the whole alphabet, really - end up being superior to A”. Said by Dr. Boggild herself during her keynote address, this lesson resonates with the key teaching that is bestowed on almost every MD-PhD student on day 1 of the program: be open and flexible to unexpected paths. In fact, unexpected paths, whether it be in our medical and/or research training, should be expected! 🐦🐦



Dr. Andrea K. Boggild (left) and Dr. Alainna J. Jamal (right) giving the keynote and alumni addresses

Where Are They Now?

Safa and Erica caught up with five 2024 grads about life and research in their first year of residency. Hear from Brian, Irene, Sachin, Sara, and Sydney below!

How has residency changed your viewpoint on your career or research?

Brian: I am very motivated to continue a career in academia, but what I learned is that your priorities during residency will change. For radiology, the day-to-day service is very manageable compared to heavy service training programs (e.x., medicine, surgery). Currently, my focus is surviving call, reading/studying and being closer to family. I hope that as my knowledge grows and my call schedule lightens, I may be able to carve out time for research. Ultimately, I plan to pursue a fellowship with a substantial research component. As my wife told me (who claims she is always correct): “You can have it all, Brian, but not all at once”.

Irene: Almost one year in, and residency has been a transformative experience in a positive way! My neurosurgical residency has brought forth the clinical realities vs. theoretical knowledge often focused on in medical school. My hands-on experience has led to a deeper understanding and appreciation of the complexities of disease management and treatment. As such, residency has only strengthened my career and research aspirations of becoming an academic neurosurgeon-scientist.

Sachin: Residency has really shaped my perspective on the role of the physician scientist. Being an integral part of the medical team and participating in decision making, I’m naturally able to ask lots of “why” questions during rounds. These have led to wonderful discussion about current and emerging data and gaps that still need to be addressed and explored.

Sara: The first year of residency is busy with a steep learning curve. Building a strong clinical knowledge base makes you a better clinician, but it also helps you identify knowledge gaps and understand patient perspectives. Take advantage of this time to grow clinically, and the rest will follow.

Sydney: The start of residency has been quite busy. I have come to realize how tricky it can be to balance clinical and research (and broader life) activities. That being said, starting residency has further fuelled my interests in surgical education research and underscored, for me, the utility of this type of work, and I hope to carve out more time as I progress through phases of my training.



Brian Tsang Diagnostic Radiology, University of Ottawa



Irene Harmsen Neurosurgery, University of Alberta



Sachin Kumar Pediatrics, Boston Combined Residency Program

Are you still participating in research, and if so, to what extent?



Sara Mirali Dermatology,
University of Toronto

Brian: Yes - minimal research (1 research block this year).

Irene: While residency is a time to focus on becoming a great neurosurgeon, there is time to dedicate to research – from finishing up old projects to starting new ones, research remains an integral part of my life. I find time during evenings and weekends when not on call or by leveraging reduced clinical hours during off-service rotations. I am also planning a post-doctoral fellowship during our dedicated PGY4 research year.

Sachin: Yes, but given the heavy clinical burden mostly dry lab/bioinformatics for pre existing projects carried on from my PhD.

Sara: Yes, I am currently in the process of setting up research projects and am fortunate to have the support of my wonderful research mentors.



Sydney McQueen
Neurosurgery,
University of Toronto

Sydney: I am still (trying to) participate in research. While the time in my PhD allowed me to focus on academics, a large part of residency is focused on building clinical skills, with a steep initial learning curve. I am fortunate to have great academic colleagues and collaborators who have helped push along research projects and maintain productivity. I look forward to trying to ramp up productivity in the future.

Have your interests (both medical and research) changed since graduation?

Brian: Yes. I think it is normal as you get more exposure to have your interests change. Don't be afraid to reach out to other researchers/mentors.

Irene: My interest in becoming an academic neurosurgeon-scientist has only been strengthened during my neurosurgery residency. As I dive deeper into neurosurgery, I am gaining a better understanding of the various subspecialty areas, including pediatrics, vascular, and functional neurosurgery, making it all that more exciting to see what the future holds!

Sachin: Personally, no. I think I'm very excited about and committed to a career in pediatric oncology. That said, I will admit that I'm more engaged and curious about clinical questions across all of the pediatric subspecialties the more exposure I get, which I'm thoroughly enjoying!

Sara: Our first year of residency is mostly off-service. I've found my interests have broadened – there are so many cool fields in medicine and I was lucky to have great clinical teachers. I'm looking forward to going back on service and applying what I've learned to my specialty. Dermatology is a fascinating field that overlaps with many branches of medicine and there's plenty of cellular and molecular biology. Likewise, I'm excited to become more involved with research next year.

Sydney: My interests remain strong. I find neurosurgery fascinating. Every day presents new challenges and great learning opportunities. It's certainly never boring! In parallel, I remain strongly interested in surgical education research, and hope to translate my new perspectives into my academic work moving forwards. 🐦

MD-PhD Seminar Spotlights: Covering All Stages of Students' Training from Lab to Life

Written by: Anita Hu

The MD-PhD program's biweekly seminars are a cornerstone of our academic year. The seminars offer a dynamic platform for students to share their research, develop new transferrable skills, and build a supportive community—all while enjoying a delicious meal! These sessions have been instrumental in fostering collaboration, encouraging growth, and connecting students across all stages of their training. Below is a look into the three key elements that have made these seminars so valuable:

1) Research Presentations: A Collaborative Learning Space

At the heart of our biweekly seminars are the research presentations from MD-PhD students in the middle of their PhD work. These presentations offer students the opportunity to discuss their ongoing projects, whether they are making progress on experimental results or navigating the challenges of research progress. What makes these presentations unique is the open exchange that follows, where peers ask questions, provide feedback, and offer alternative scientific perspectives from their own areas of expertise.



Andrew Mazzanti, fourth-year PhD student researching developmental epigenetics, presents his work on endogenous retroviruses in a humoursly engaging format during seminar.



MD-PhD students enjoying a picnic at Queen's Park post-MD-PhD seminar!

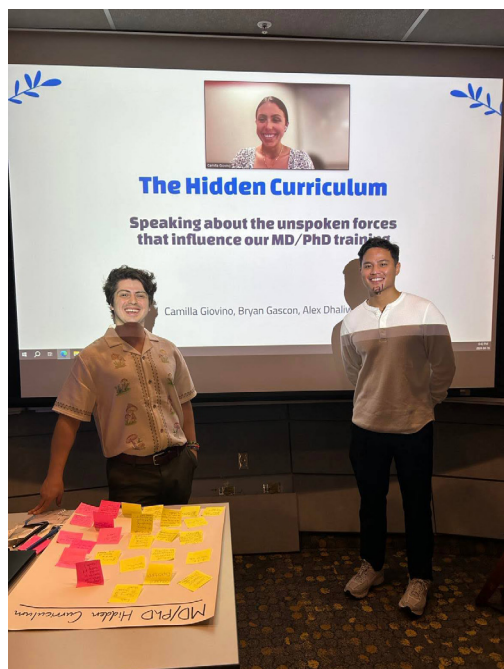
2) Workshops: Expanding Professional and Personal Skillsets

Beyond research, the seminars also feature skill-building workshops led by invited facilitators. These workshops are designed to help students grow as future clinician-scientists.

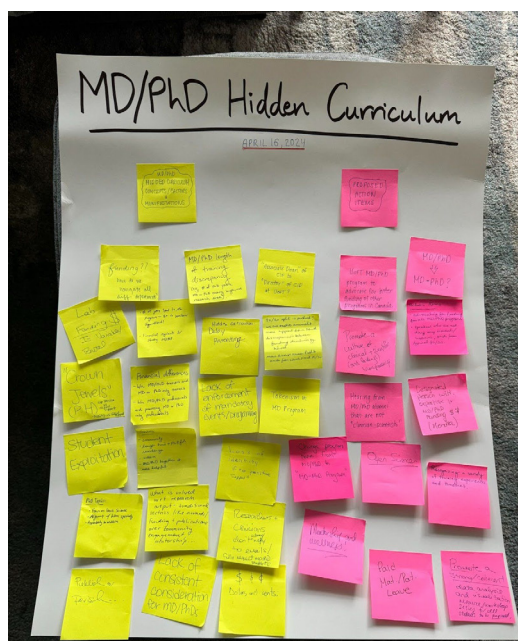
One of the standout sessions was the Eureka Knowledge Translation workshop, led by Alex Dhaliwal, Bryan Gascon, and Camilla Giovino—students who attended the Eureka Institute for Translational Medicine summer program in the Netherlands. They facilitated a thoughtful discussion-based workshop on the hidden curriculum and unspoken forces behind MD-PhD training.

Another highly anticipated workshop was led by Dr. Shirin Dason, a physician in Obstetrics and Gynecology and Reproductive Endocrinology and

Infertility, who offered a candid and insightful session on Family Planning for future physician-scientists. Dr. Dason provided practical tips and hosted a very special panel of UofT MD-PhD alumni, giving attendees personal insights and roadmaps for managing both family and career in the years to come.



Alex Dhaliwal, Bryan Gascon, and Camilla Giovino facilitate a collaborative workshop on the hidden curriculum and unspoken forces behind MD-PhD training.



Keeping with the program's commitment to fostering equity and inclusion, the seminar series also included a workshop on EDI in Action: Creating a Code of Conduct for Tomorrow's Physician-Scientists. This session empowered students to think critically about how to foster inclusive, respectful environments in our MD-PhD community, leading to the implementation of our own MD-PhD Code of Conduct, spearheaded by our MD-PhD Class Council's Co-Presidents, Andrew Mazzanti and Safa Majeed.



MD-PhD Class Council Co-Presidents, Andrew Mazzanti and Safa Majeed, lead Town Hall on crafting the EDI-focused MD-PhD Program Code of Conduct.

3) Bonding: Welcoming and Connecting First-Year Students

While research and skill-building are core to our seminars, bonding has been another key focus, especially for welcoming first-year MD-PhD students. During the start of each academic year, the first-years introduce themselves, presenting their hobbies, research, and academic interests. These introductions have helped new students integrate into the larger cohort and begin forming connections that will support them throughout the program.

The relaxed atmosphere of these seminars, combined with informal conversations and shared experiences, has created a sense of community that extends beyond the classroom. The peer support and networking opportunities have been invaluable, allowing

students from different stages of their academic journey to come together, share advice, and build lasting friendships.



First-year MD-PhD students, Jasmine Ryu Won Kang (above) and Alexander Bailey (below), presenting their intro talks during seminar in early September 2023.



The biweekly MD-PhD seminars have proven to be more than just academic sessions—they are spaces for intellectual growth, personal development, and community-building. We look forward to the seminars to come, as they continue to be a vital part of the MD-PhD experience, helping students thrive as

researchers, leaders, and engaged members of the MD-PhD community.

This year, the MD-PhD Class Council, along with Program Director, Dr. Nicola Jones, aim to enhance engagement between student trainees and the MD-PhD professional community. MD-PhD alumni are welcome to attend one of our future networking events or present their unique journey through the MD-PhD program and navigating the health-care world as a trained professional! Please keep in touch! 🐦🐦

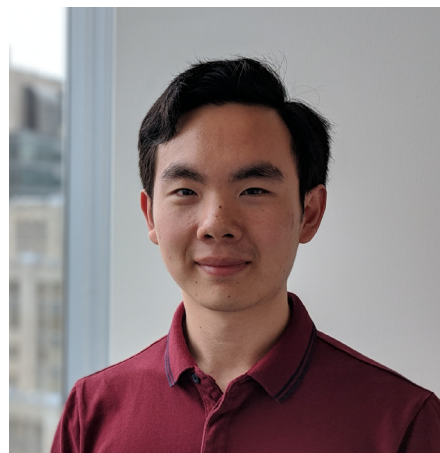
Recap of Student Seminar Spotlights

Student seminars are a highlight of the UofT MD-PhD program; not just for the amazing dinners, but for the advice shared by upper year students. Read on for highlights from our student seminar presenters over the past few years.

Robert Lao

Scientific Update

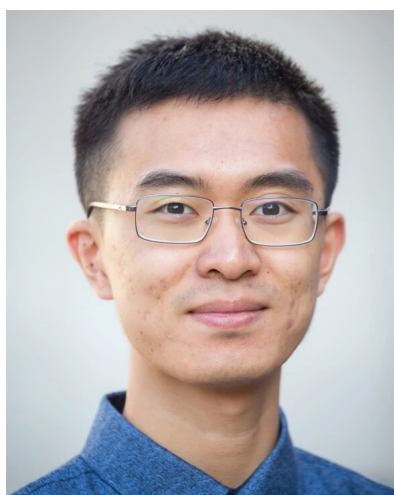
Children born with congenital heart disease are highly vulnerable, many of whom will require complex cardiovascular surgery (CVS) to survive. A dominant factor determining their CVS outcomes is how long the heart must be stopped during repair. Myocardial protection during pediatric CVS has not been well studied. Currently, protection is achieved through infusions of ‘cardioplegia’, however variability in these guidelines used across the world suggests a lack of consensus on best practice. Additionally, there are no large animal models described that accurately reflect current pediatric CVS protocols, and thus little is known about the mechanisms determining poor outcomes. So far in my PhD, I have developed a new pre-clinical pediatric pig model of CVS to (1) characterize the pathways involved in heart damage over those long periods that the heart must be stopped during surgery to enable repair and (2) leverage this new model to translate potential myocardial protection therapies to mitigate heart damage.



Tidbit of Advice:

“Don’t assume that everyone you work with, especially your supervisors, know that you need help or what you need help with. Identify who can help, and then tell them exactly how they can help you.”

Bill Shi



Tip:

Sleep well during your PhD years because you will sleep less during your MD years...

Scientific Update:

In my PhD project, I’m developing a portable, cost-effective visual field test using virtual reality, which can be used anywhere. My project also involves enhancing the test algorithm with machine learning, such that the test is faster and more robust against patient errors. This innovation streamlines workflow in ophthalmology clinics and opens up new possibilities for home-based glaucoma telemedicine and community clinic testing. I am really excited to see the growing acceptance of virtual reality devices in ophthalmology and the potential impact on eye care worldwide.

Steven Botts

Tips:

1. Expect the unexpected: Experiments and life will often take you in new directions – try to be flexible. Leverage these opportunities to your advantage and at worst, try to make the best of a bad situation.
2. Be your own advocate (or find a mentor who will advocate for you): Make sure that your needs are prioritized during your training – this is your degree!
3. Don't try to fit a square peg into a round hole: Recognize when you need to prune research directions for a more coherent thesis. Side projects can be beneficial, just be wary of spreading your time too thin and diluting the main message of your work.
4. Failed experiments are not failures: These are opportunities to learn foundational skills and inform new directions for research.



5. Make your journey worthwhile (and try to enjoy it!): Don't be afraid to extend the length of your training if it's the most sensible option for your career goals. Take time to cultivate your relationships with friends and family – these will pay dividends.

Scientific Update:

I am a sixth-year MD/PhD student in the lab of Drs. Jason Fish and Kathryn Howe at the Toronto General Hospital Research Institute and Peter Munk Cardiac Centre, who investigate the molecular mechanisms underlying endothelial cell (EC) function. My research focuses on the ETS transcription factor ERG, a master regulator of EC fate, and how loss of EC identity can promote vascular diseases such as atherosclerosis and aneurysm. Using complementary in vitro and in vivo models for loss of ERG in aortic ECs, including CRISPR/Cas9-mediated deletion of ERG in cultured human aortic ECs and EC-specific Erg knockout in multiple mouse models of atherosclerosis, I have shown that ERG has a robust impact on EC chromatin accessibility and gene expression and the formation of atherosclerotic plaque. Specifically, loss of ERG promotes a pathological endothelial-to-mesenchymal transition through TGF β -SMAD signalling that leads to marked ingression of ECs from the endothelium to the plaque interior. Phenotypically, ERG knockout results in increased plaque burden and development in normally atheroprotective regions and may reduce plaque stability (decreased fibrous cap thickness) and enhance degradation of the aortic wall (increased elastin fragmentation). These findings highlight loss of ERG as a novel mechanism by which aortic intimal ECs acquire mesenchymal identity in the setting of atherosclerosis and a bona fide driver of endothelial lineage cell expansion within developing plaques.

Ethan Malkin

Advice:

- ◇ Don't take rejection or "failure" personally - try and try again!
- ◇ Seeing your MD class graduate is hard - lean on your fellow MD/PhDs for support!
- ◇ Venting is key - build a strong and diverse support system!
- ◇ Start thinking about your thesis early - know the requirements and expectations so you don't get caught in red tape.
- ◇ The most important thing is you - focus on your own personal goals, which might not always align with those of your supervisor, committee, collaborators, etc.



Scientific Update

Cells can release their DNA into the extracellular space and circulation by active mechanisms or as a product of cell death. In oncology, this cell-free DNA (cfDNA) has emerged as a promising source of cancer biomarkers because it contains actionable information about a patient's disease and can be readily obtained via a simple blood draw. In addition to its use in biomarker applications, cfDNA may also function as a mediator of pro-inflammatory signaling in the tumour microenvironment. Despite its mounting importance both clinically and physiologically, the biological features of cfDNA remain poorly understood. In particular, the structural relationship between cfDNA and other biological macromolecules – its topology – has not been thoroughly investigated. In my doctoral work, I comprehensively characterized cfDNA topology in pre-clinical and clinical cancer models and found that a particular subset of mitochondrial-derived cfDNA showed diagnostic and prognostic potential as a clinical cancer biomarker. I also demonstrated that this same cfDNA subset, when derived from specific cell death pathways, was particularly adept at inducing macrophage pro-inflammatory signaling via DNA sensor activation. Altogether, the knowledge gained from these studies contributes to a refined model of cfDNA biology and structure, which can be leveraged both for cancer liquid biopsy applications and to bolster our overall understanding of tumour-immune interactions as they relate to patient responses to immunotherapy.

Shahan Haider

Tips:

1. Collaborate with others and don't be afraid to ask for help, especially from your lab mates who may have experience in the techniques you are using.
2. Learn from failure experiments and negative results. They're super annoying but helpful in understanding the system you are working with.
3. Take advantage of the flexibility that comes with PhD and make sure to give your friends and families time as well.



Scientific Update:

For my PhD project, I am focusing on low-grade gliomas (LGG) which are the most common primary malignant brain tumour in young adults. These brain tumours are usually diagnosed at a median age of ~34 years and are initially relatively benign, and often grow unrecognized over decades. Unfortunately, almost all LGG eventually progress to secondary high-grade glioblastoma (GBM), and patients succumb to their disease within a few months. LGGs are known to harbour transforming mutations in IDH1 or IDH2, and another 2-3 well-characterized genes. However, the alterations that cause progression to lethal GBM are unknown. Hence, the overarching goal of my project is to decode the molecular mechanisms underling LGG-to-GBM progression. Recent research has shown the LGG carry a highly recurrent and heterogenous pattern of copy-number alterations suggesting that this disease is largely driven by aneuploidy. Since my seminar, I have worked with our collaborators to identify 11 recurrent copy number alterations (CNA) enriched in LGG patents. I have initiated series of CRISPR-Cas9 overexpression and knockout genetic screens in a faithful LGG model to assess the transforming potential of all the genes residing on these CNAs. Until now, I have uncovered 7 driver genes on these chromosome arms driving distinct molecular pathways. Interestingly, the majority of driver appear to be involved in immune response implicating immune system dysregulation as a major pathway underlying LGG-to-GBM progression. 🐦

Awards, 2023-2024

Compiled by Andrew McLeod

Falan Bennett: SickKids Restrcomp Scholarship, \$26,000

Allysia Chin: CGS-M, \$27,000

Armaan Fallahi: 2024-25 Yuet Ngor Wong Award, \$10,000; CIHR CGS-M, \$27,000

Nicholas Garrido: Banting & Best Diabetes Centre-Novo Nordisk Studentships, \$25,000; Ontario Graduate Scholarship, \$15,000

Julian Gilmore: NSERC CGS-D, \$40,000; Restrcomp, \$26,000 (on hold until CGS-D complete)

Syed Shahan Haider: 2024 OSOTF: The Canada Life Assurance Company Studentships, \$17,000

Anita Hu: CGS-M, \$27,000

Richard Huang: Ontario Graduate Scholarship, \$15,000

Jasmine (Ryu Won) Kang: Ontario Graduate Scholarship, \$15,000

Diane (Daeun) Kim: NSERC CGS-M, \$27,000

Hillary Lia: CIHR CGS-D, \$40,000

Gemma Postill: AI4PH award; Vanier, \$50,000

Autumn Rennie: SSHRC CGS-D, \$40,000

Matthaeus Ware: Canadian Medical Hall of Fame award, \$5,000

Erica Wennberg: CIHR Vanier CGS, \$50,000

Angela Zhou: Ontario Graduate Scholarship, \$15,000

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