THERE’S NO PLACE LIKE HOME.

I’ve been thinking a lot about “home” lately, triggered by the fact that my family and I just bought a house here, almost 3 years after we returned to Hamilton in 2015. We won’t be moving until August, but already my head is abuzz with plans about how to make that house our home.

That will be the second big move of the year for me — in April, the BHSc (Hons) Program finally moved into our newly renovated offices on the 3rd floor of MDCL, and it is really good to be back in our new-and-improved home. Students who joined the program in 2017 will only have known us in our temporary quarters, and we are really looking forward to having all of you come and check out our new digs! I want to extend my gratitude to everyone who made this possible, and to say thanks for your patience and flexibility as the various inconveniences of renovations unfolded. If you haven’t already, I hope you’ll stop by soon...the finishing touches at the main entrance should be completed shortly.

BHSc has also just progressed through a couple of significant annual milestones that give me echoes of ‘home’ — admissions decisions and convocation. With the former, we invite a new cohort of students to make BHSc, McMaster, and Hamilton their new home, in many cases leaving their family homes for the first time. With the latter, HealthScis take a big step in their life’s journeys, fledging the BHSc nest and flying to new things, new opportunities, and new homes (both literally and figuratively).

The old cliché says that “home is where the heart is”, and from that perspective my home is in many places — towns and cities and houses I’ve lived in, communities I’ve been a part of. When I moved away from Sudbury a few years ago, I came across a quote from author Miriam Adeney that really resonated for me, who said “You will never be completely at home again, because part of your heart will always be elsewhere. That is the price you pay for the richness of loving and knowing people in more than one place.” I love the idea that ‘home’ can be a diffuse, distributed entity and not necessarily a literal place. After all, home is not just “the place where your wi-fi connects automatically”; for those in the BHSc Community, past, present, and future, I hope you'll experience HealthSci as a supportive home where you are always welcome, and where a piece of your heart will always reside!

Stacey Ritz
Assistant Dean, BHSc (Honours) Program
Dorsa Kord, BHSc (Honours), Class of 2020, is a recipient of the Fessenden-Trott Scholarship. The $9000 award recognizes students based on their outstanding academic achievement and extracurricular involvement. As a science enthusiast, Dorsa has been regularly involved in the rare disease community and she is currently McMaster MEDLIFE’s (Medicine, Education, and Development for Low Families Everywhere) mobile clinic leader. Her leadership experience involves organizing and promoting service learning trips to underdeveloped countries. Dorsa is also an intern with the publicity team of Rare Disease Review, a student-run journal that aims to provide information and discuss the societal aspects and implications of rare diseases. Her role involves promoting the journal and increasing awareness about rare diseases on and off campus.

In addition, Dorsa has been involved with the RGI (Rare Genomics Institute) for several years, whose mission is to help rare disease patients find hope for a cure. Her involvement started off as an online internship and now she assists with a few small projects to maintain their website. As a passionate and driven individual for rare diseases, she is also currently performing a systematic review on the rare disease: facioscapulohumeral muscular dystrophy, and volunteers at the McMaster Children’s Hospital. Outside of her community involvement, she enjoys playing sports such as intramural soccer and volleyball. Below, Dorsa answered some questions pertaining to her outstanding community service and her future aspirations.

How has your contribution to volunteerism and community service impacted the community? What I am hoping to achieve through my efforts is to increase awareness about rare diseases and the difficulties that those patients and their caregivers encounter just on the basis of the uniqueness of their condition. Traditionally, more common diseases receive more attention from society. Fortunately, more and more people affected by rare diseases are now voicing their concern. I am one of the many voices trying to raise awareness about a population that deserves to receive the same health services and care as any population with common diseases. I am trying to engage in different aspects of this issue because in my opinion, not only is this a medical issue, but also a societal and an ethical one.

What has motivated you to make an impact in the community? When I first started my involvement with the rare disease community, one of the patients spoke to told me, “having a rare disease is like being a foreigner in the medical community, speaking a different language. No-one truly understands you.” This sentence really stuck with me and shaped the direction I wanted to take in the future. Working closely with rare disease patients and listening to what they have to say, I developed a passion for this community. I think my most significant motivation is that I truly and genuinely care about this cause.

Do you have advice for students who hope to create a balance between academics and extracurricular activities? Managing academic life sometimes can be quite stressful and it may seem like taking on extra commitments will only make our lives more difficult. Extracurricular activities are not simply a means of building your CV; I really believe that once you find a cause that deeply interests you, it can keep you more focused and motivated even in your academic pursuits. You may have heard the quote “find what you love and let it kill you”, while many may disagree, I find it very inspiring. It may sound cliché, but I do think that once you find what gets your heart racing, you will be determined to do more rather than less.

What do you hope to pursue in the future? I hope to pursue a career in medicine. I would definitely want to continue my involvement with the rare disease community, and not just in a clinical setting. I have recently become interested in health policy, especially in Canada where there is a large gap in policy regarding rare diseases. I envision myself focusing clinically on rare diseases in the field of cardiology, perhaps, while advocating for health policy and the social aspects of this issue.

The Bachelor of Health Sciences (Honours) Program Scholarship was established in 2004 by students, alumni, faculty, staff and friends. This scholarship is awarded to BHSc (Honours) students who have made significant and meaningful volunteer contributions to the Hamilton and McMaster University communities.

In 2017 we were fortunate to award two scholarships, The scholarship recipients for 2017 were Michael Parvizian, Class of 2017 and Amr Saleh, Class of 2018. Since starting in the BHSc program in 2014, Michael Parvizian has consistently worked to engage himself in the McMaster and greater Hamilton community. Throughout his time at McMaster, Michael has made a point of volunteering in the local community, working with and helping to coordinate groups that volunteer at organizations such as Welcome Inn and Good Shepherd. Through his time at McMaster, Michael was extensively involved with the local World Vision chapter, focusing on sustainable development in various areas around the world. In addition, he has worked extensively with Bachelor of Health Sciences and McMaster groups/initiatives, such as the Bachelor of Health Sciences Society, MacGreen, and the Building Our Safe Schools group. Michael views these experiences as being instrumental to his undergraduate education, helping to build skills and perspectives that can’t always be gleaned from classroom learning alone. He is grateful for the opportunities provided by the BHSc program and McMaster community, and believes he will carry the lessons learned here at McMaster with him throughout his entire life. Moving forward, Michael plans to continue to serve the community as he works towards his medical degree at McMaster.

Drawing on his experience as a bystander who, in middle school, passively watched as his friend got bullied, Amr has long been committed to bullying prevention activism. With 1 in 3 adolescent students in Canada being victims of bullying, Amr saw a need for a sustainable youth-led effort to change students’ behaviour. In 2014, Amr co-founded the Building Our Safe Schools (BOSS) initiative. Through this initiative, he worked alongside fellow McMaster students who are passionate about reducing bullying in Hamilton schools through mentorship, leadership training, and evidence-based workshops. McMaster students, united under the mission of improving the lives of young students, train elementary school, middle school, and high school students on how to carry out powerful bullying prevention efforts and be effective leaders of change within their communities. As fellow students joined this cause, Amr’s vision for BOSS quickly gained momentum; BOSS formed partnerships with leading national organizations including the Canadian Red Cross, Crime Stoppers, and the Promoting Relationships and Ending Violence Network (PREVNet) and the vision of BOSS also expanded beyond McMaster to several other Canadian universities. In 2016, Amr had the opportunity to represent the BOSS team at the International Bullying Prevention Conference in New Orleans where he delivered a talk about the power of university students in the fight against bullying. Bullying prevention is a cause that resonates with many. Amr has had the privilege of seeing BOSS grow under the guidance of inspiring activists and incredible leaders including, among many, fellow co-founder Cameron Taheri and current BOSS presidents and Bachelor of Health Sciences students: Haris Saud and Kestrel McNeil.
QUEEN ELIZABETH SCHOLARS IN STRENGTHENING HEALTH SYSTEMS
By: Sabrina Lin, BHSc (Honours), Class of 2019

Queen Elizabeth Scholars in Strengthening Health Systems

The McMaster Health Forum is one of 34 Canadian institutional partners of the Canadian Queen Elizabeth II Diamond Jubilee Scholarship program. Through the program, Queen Elizabeth Scholars have the opportunity to contribute to strengthening health systems in any of the 20 Commonwealth countries – ranging from Australia to Zambia. The Forum’s scholarship program in strengthening health systems harnesses six core partnerships, a broader network of WHO-sponsored Evidence-Informed Policy Networks (EVIPNet), and seven educational programs at McMaster.

The Forum’s seven core partners in Commonwealth countries, which can serve as hosts to outgoing interns and scholars, include:
• Caribbean Public Health Agency in Port of Spain, Trinidad and Tobago
• Makerere University’s College of Health Sciences in Kampala, Uganda
• Six Institute in Sydney, Australia
• Selensbock University’s Faculty of Medicine and Health Sciences in Cape Town, South Africa

Scholarships are available both to McMaster students seeking to do field research or an internship in a Commonwealth country other than Canada, and to Commonwealth country students seeking to pursue graduate training at McMaster. Eligible McMaster programs from which applicants can be drawn include the Health Policy PhD program, Health Research Methodology MSc or PhD program, Master of Public Health program, Global Health MSc program, eHealth MSc program, and BHSc program (ongoing internships only).

The interviews below feature unique insights from past BHSc QE Scholars, Abi Kirubarajan, Aditya Nidumolu, and Malcolm Hartman, who travelled to the United Kingdom, Trinidad and Tobago, and Uganda respectively. If you are interested in learning more about this scholarship opportunity, please visit: https://www.mcmasterforum.org/learn-how/student-scholarships

ABIRAMI KIRUBARAJAN

Please describe your QES placement and the work you did there.

This summer, I traveled to Oxford in the United Kingdom to investigate street triage within the National Health System (NHS). Street triage is quite an interesting pilot service that is within the United Kingdom. It involves police officers and health professionals collaborating in a co-response model for psychiatric emergencies, which can alleviate the distress felt by patients in mental health crises. Through an NHS and Oxford University collaboration, I helped conduct evaluations and a systematic review of these co-response teams. I also helped lead a qualitative survey of Thames Valley Police officers to identify their feedback regarding the NHS collaboration.

While at Oxford, I also got the chance to serve as a volunteer Refugee Health Coordinator with Evidence Aid. Through a collaboration with Cochrane Library, I helped curate Evidence Aid’s available resources for refugee healthcare. My role involved ongoing search strategies on the best available evidence, chairing global meetings with stakeholders, and summarizing an exhaustive list of evidence-based guidelines for healthcare providers. This was an amazing experience for me to explore my interests in the social determinants of health, and as well as health policy decision-making.

What were your main takeaways from your QES placement?

Wherever you go, do not be afraid to try new things! It is so easy for students to stay within their comfort zones, and stick to what is known. Be adventurous and willing to learn, more often than not, people will be willing to teach you new things. A positive attitude and strong work ethic will go a long way. My mentors at the NHS and Evidence Aid were all amazing. They constantly challenged my skillset and provided me with new opportunities to grow. While it can be tempting to stick to what you have done before, it is only possible to learn through change.

What were some of your fondest memories abroad?

I loved exploring the United Kingdom and all that it had to offer. My favourite places to visit were the Wellcome Library (they have such a beautiful focus on the medical humanities) and the Natural History Museum (their marine biology exhibits were stunning). My supervisors also insisted that I explore Oxford University, as well as various offices of Cochrane Library. It was also wonderful to attend conferences such as the British Medical Journal’s conference on evidence-based medicine, as well as the Global Evidence Summit in Cape Town.

Above all, it was really nice to explore a completely new health system. My supervisor at the NHS was extremely supportive in letting me shadow his clinical practice and ask questions regarding the United Kingdom political system. The immersion provided me with a greater context for the research I was conducting, which I found incredibly helpful.

ADITYA NIDUMOLU

Please describe your QES placement and the work you did there. Alongside fellow Queen Elizabeth Scholar Inna Berdichevskaya, I worked at the Caribbean Public Health Agency (CARPHA) headquarters in Port of Spain, Trinidad and Tobago from May 2016 to July 2016. CARPHA was formed in 2011 to develop and coordinate responses to public health priorities for the 20 member nations of the Caribbean community (CARICOM). Some of the services CARPHA provides to the region includes coordinating emergency disaster responses, and ensuring that member nations are compliant with international health regulations.

Inna and I primarily worked in CARPHA’s research, training, and policy development unit under Dr. Andrea Yearwood to help push forward initiatives that support evidence-based public health policymaking. These included:
1. Preparing for and running a stakeholder dialogue on nutritional environments, wherein public health leaders from the Caribbean private and public sectors worked together to develop policies that would increase public access to and consumption of nutritional foods in Caribbean nations
2. Gathering and synthesizing research on policies used to reduce obesity in other regions of the world to identify best practices that could be applied in the Caribbean
3. Supporting the development of the CARPHA evidence portal – a platform for Caribbean health policymakers to find and share high quality policies with one another

4. Developing guidelines describing how best practices and policies should be recorded to optimally be shared between nations.

What were your main takeaways from your QES placement?

During our placement, Inna and I had the chance to observe the barriers the Caribbean faced against the implementation of evidence-based health policy aimed at improving nutrition in the region. The Caribbean nations are net importers of nutritionally poor, calorically rich foods from Western nations. These include breads, fried foods, and soft drinks. Consequently, obesity has steadily been on the rise throughout the region. Though the social determinants of obesity in the Caribbean region are complex, three key factors are that: (1) companies selling nutritionally poor yet calorically rich foods have a very large presence in the Caribbean through their marketing efforts, (2) food importation underscores a very important economic relationship between the Caribbean and other Western nations. Thus, interventions to curb the sales of nutritionally poor food or reduce public interest in buying these foods will clash with future import policies, and (3) unhealthy food is substantially cheaper and easier to access than healthy foods. For example, a bottle of water was often 2-3 times more expensive than a bottle of coke in many of places I visited in Trinidad & Tobago.

Much of the work we did with CARPHA involved understanding how to optimally design and implement policies in a way that mitigates these barriers. Key steps in the process included: (1) for the policymakers, to advocate for in a way that captures the interest of the public and government, (2) developing policies based on research evidence and stakeholder input in a way that, if implemented, would likely be viable, and (3) working with stakeholders in the political environment to ensure that politicians increasingly prioritize healthcare interests.

What were some of your fondest memories abroad?

Trinidad is approximately 143km long and 61km wide. This makes it possible to get from one side of the nation to the next in around 2-3 hours at most by public transport. Each weekend during our placement, Inna and I made efforts to explore different landmarks within the country. In addition, our work with CARPHA allowed us to meet professionals and students...
from around the world in fields including communications, law, lab science, and nutrition. These friendships greatly enhanced our time in the country and many of them continue to today.

Any final words of wisdom?

Placements and internships provide the opportunity to gain a wide range of hard and soft skills. The QES placement offers a structured and funded approach to involve students in high impact organizations that strengthen health systems. I would encourage you to apply to QES if you are interested in developing a career that touches on strengthening health systems. You can learn more about interventions to improve health systems by visiting the McMaster Health Forum website as well as those of major health organizations such as the WHO. One of the factors that makes BHSc an amazing program is the numerous research or internships opportunities you can pursue as a part of your formal coursework. I would definitely recommend taking advantage of this by contacting organizations you admire to see if you can set up any of your project courses with them.

MALCOLM HARTMAN

Please describe your QES placement and the work you did there. My QES placement was at the Department of Planning, Monitoring, and Evaluations (DPME) in South Africa. DPME is a national department in the Republic of South Africa, which works to improve government outcomes and facilitate improved program service delivery.During my time with DPME, the research unit was primarily focused on informing the implementation of Chapter 13 of the National Development Plan. Chapter 13 speaks to building a capable state and developmental state; a statement which many policy-makers and legislators needed clarification on to unpack what this would look like for South Africa. The term developmental state was classically used to describe the economic growth model of specific East Asian states, and over time, its use has been applied to a variety of countries that have had successful growth.

The research project aimed to:

1. Understand the evidence on developmental states to construct a knowledge base consisting of relevant evidence.
2. Synthesize findings from identified cases on the attributes and policy mixes of developmental states for further analysis and interpretation

These goals were accomplished by following a modified systematic review methodology. Prior to the start of my internship and throughout my time in South Africa, the team:
1. Performed literature searches (scientific and grey literature)
2. Screened articles for inclusion
3. Extracted data (using the CoFOG organization framework)
4. Synthesized findings (multiple formats used depending on the specifics of the policymaker request)

This research process was very collaborative and the team worked with stakeholders across government departments and various academic experts.

What were your main takeaways from your QES placement?

1. Policy research should be driven by policymakers - Since I was coming from an academic background, working in a government setting was an eye-opening opportunity. I was able to gain insight on what truly ‘policy-relevant’ research looked like by listening to my colleagues’ experiences. There were many stories of the disconnect between academia and government policy and how more often than not, academic research was not guided by government priorities.

Now that I am coming back into academia I will value this experience of being on the opposite side of the academic-government interface. By actively seeking out EIDM champions within the government and allowing them to drive research I know I will be able to achieve a larger impact.

2. Students can offer value to senior level teams - When I first learned of the research project I was fearful due to my lack of knowledge on economic theory. However, I quickly discovered that having this content knowledge would not hinder me in any significant way. I found that I was able to bring new ideas, resources and offer feedback on the project, all skills which students possess. Senior members of the team valued my ability to think systematically and have a critical mindset rather than know the specific details of an economic theory.

What were some of your fondest memories abroad?

South Africa is a beautiful country with many different things, learning and making memories; I am glad that I said yes.

Any final words of wisdom?

If someone offers you an opportunity, say yes. This whole experience took me out of my comfort zone and it was sometimes difficult to say ‘yes’. Looking back, every time I said yes to an opportunity I was able to grow personally/professionally and have a fantastic time. I have found that being a QE Scholar is all about trying new things, learning and making memories; I am glad that I said yes.

To understand global health, one needs to take an interdisciplinary and diverse approach towards its study. I believe the changes made to the Global Health specialization in the BHSc (Honours) program more fully embody this approach to give students a more comprehensive grasp of the study of global health.

These changes have been years in the making. In a conversation I had with Stacey Ritz, she commented that she ‘began to consider changes a couple of years ago, when we saw a mismatch in Global Health -- we always had significantly more applicants for the specialization than we could accommodate, and not all of those would actually complete the curriculum.’ She went on to say that other students wanted to take some Global Health courses but not commit to the entire specialization. These observations led to the idea to convert the Global Health Specialization into a Minor.

This presented a great opportunity for some interdisciplinary collaboration with the Faculty of Social Sciences, as they already had the Interdisciplinary Minor in Globalization Studies, providing existing framework to build from. So after connecting with them in early 2017 and after a few months of great collaboration to integrate BHSc curriculum into the existing Minor, a new, fourth Theme in the Minor was formed called “Globalization & Health”.

This new Minor presented a win – win situation for everyone. BHSc students now have the flexibility to dabble in Global Health courses and they now have more interdisciplinary course options. Also, students from other programs can now take HTHSCI courses that were previously only for Health Sci students.

Note that the 3A15 “Embedded Learning Experience” will be phased out, but the 4th year senior project and thesis courses can be used in a similar manner. Also, completing the Minor can be done without an application, unlike the former Global Health Specialization which required an entrance application.

I personally think that these new changes seem really cool and that they make a lot of practical sense as well. I truly think that Global Health is really finding its home! Check out the Undergraduate Calendar for more information on the Minor and https://bhsc.mcmaster.ca/current-students/choose-your-specialization/ for more information about Global Health and the other specializations.

Changes to the Global Health Specialization

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Changes to the Global Health Specialization

As Op-Ed by: Eric Mîne, BHSc (Honours), Class of 2019

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HTHSCI 4ID3: Innovation by Design
By: David Lee, BHSc (Honours), Class of 2018

In the fall, the Faculty of Health Sciences and the DeGroote School of Business introduced an interdisciplinary course aimed at teaching students to engage in design thinking as a methodology to assess health problems. The course is rightfully named, “Innovation by Design” (HTHSCI 4ID3), as students develop leadership capabilities for identifying and framing problems, understanding the needs of stakeholders, coming up with innovative ideas, testing and iterating ideas, and thinking through how ideas might be sustained and implemented. The value behind this course lies in practical application through a series of design challenges led by instructors that illuminate the development of a prototype solution to current health-care challenges.

In this regard, HTHSCI 4ID3 is a unique course, as students are ushered into real health problems to collect meaningful data, iterate alternative design options, and build a prototype solution for validation. The course takes an interdisciplinary approach and is therefore open to all undergraduate students level 3 or higher and graduate students.

Coordinated by Dr. Sean Park with fellow instructors, Dr. Michael Hartmann, Dr. Karel Vriendenburg and Dr. Delsworth Harnish, the course is structured by an interdisciplinary faculty team that is drawn from the DeGroote School of Business, Faculty of Health Sciences and IBM’s design leadership team.

Over the course of the term (Sept 2017 - March 2018) students in small teams undertake projects that address some dimension of leadership in the health context, while also attending five sessions focused on the process of design thinking and eight tutorials on topics such as leadership, ethics, and innovation. Students learn about the innovation process, inspiration, ideation, and finally implementation. Our most recent workshop from IBM focused on the principles of design thinking such as focusing on user outcomes, diversifying teams, and restless reinvention.

After learning about and developing the tools that are essential to design thinking, 4ID3 students apply them to their projects. For my project, my team and I are responsible for finding an approach to enhance patient safety and well being through effective use of protective equipment. We are currently working with the Hospital for Sick Children (Sick Kids) to assess and support the patient experience by ensuring effective use of protective equipment. The project has allowed my team and I to meet with various stakeholders within the Sick Kids’ administrative team such as their Chief Medical Officer and infectious disease consultants to identify key problems and challenges within their practice. Through field observations our team has been able to generate relevant ethnographic data that will help us better understand human needs behind the challenge. We are currently in the process of synthesizing the insights we have gathered from our research and consultations with various stakeholders to generate a solution to make protective equipment more accessible and encourage user compliance. The chance to not only develop academic skills but also apply these relevant skills to the work force is one that is unique to this course. These skills have inspired students to create their own companies beyond university.
Welcome to Dr. Caitlin Mullarkey
By: Stacey Ritz, Assistant Dean, BHSc (Honours) Program

The BHSc (Honours) Program is delighted to welcome Dr. Caitlin Mullarkey as an Assistant Professor, as of August 1, 2017.

A Rhodes Scholar, Dr. Mullarkey’s received her doctorate from the University of Oxford where she worked on a novel influenza vaccination strategy. She completed a postdoctoral fellowship at the Icahn School of Medicine at Mount Sinai in New York under the mentorship of Dr. Peter Palese. During her postdoctoral studies, she continued to investigate immunological responses to influenza and flu vaccines.

Cait’s teaching philosophy is a great fit with the BHSc (Honours) Program, emphasizing student-centred, active learning that blends theory and practice, the importance of feedback for learning, and the development of transferrable skills along with knowledge.

“My approach has been profoundly influenced and shaped by my own experiences as a student, first in the setting of a small liberal arts college, and subsequently in the Oxford tutorial system, where the importance of student-faculty interactions and collaboration were deeply impressed upon me,” she notes. “Moreover, as a research scientist, my teaching is also informed by the scientific method, where we begin by formulating a series of questions.”

After arriving in Hamilton in early 2017, Caitlin quickly became involved in teaching at McMaster. In addition to supporting teaching in HTHSCI 4J03 – Immunological Principles in Practice, she will also be joining the facilitation teams in our 2nd year Inquiry Courses (HTHSCI 2E03 – Inquiry II: Biochemistry, and HTHSCI 2K03 – Cell Biology), and working with Chari on HTHSCI 1106 – Cellular & Molecular Biology.

An avid runner throughout college and graduate school, Caitlin is also enjoying running along Lake Ontario. The running is necessary, because Cait is a self-proclaimed “foodie” and thoroughly enjoys exploring the Hamilton food scene.

“I’m am thrilled to be part of such a unique opportunity and I’m glad to be a part of it. Please join us in giving Dr. Mullarkey a warm welcome to the BHSc (Honours) Community and to McMaster.

The Rhodes Scholar with a Passion for Virology: Welcome to BHSC, Dr. Mullarkey! An Interview with Dr. Caitlin Mullarkey, a New Assistant Professor in the BHSc (Honours) Program
Interview completed by Eric Mintz, BHSc (Honours), Class of 2019

E - Can you tell me a little about your background before Mac?

Dr. Mullarkey - Sure! Well first things first, I’m American. I grew up in Wilmington, Delaware - which is very close to Philadelphia. I completed my undergraduate studies at a very small liberal arts school called Swarthmore College. In my final year of undergrad, I was awarded a Rhodes Scholarship which allowed me to pursue graduate studies at the University of Oxford. I lived abroad for 4 years, finishing my MSc and DPhil where my research was focused on a novel influenza vaccine. My next move was to New York City, where I trained as a postdoctoral fellow with Dr. Peter Palese, a world-renowned virologist. During that time, I also met my now husband, Dr. Matthew Miller (his appointment is Biochemistry at Mac). I think that sums up about a decade of my life rather concisely!

E - So why did you go into immunology/virology?

M - So I always knew I was interested in science. When I was 18 years old self-going (going) into undergrad, to me a logical progression and career path was medicine. I didn’t really know what other science careers there were out there. So I fell into research accidentally. I did a cell biology project with a professor when I was a sophomore. I really enjoyed working at the bench and working in a lab and I liked the idea of doing experiments and having results that no one else had done before. So that’s how I came to be. So, I decided after undergrad I was going to do a Master’s degree in immunology. Then it advanced into a PhD program.

E - What would you be doing if you weren’t doing virology or immunology?

M - Behavioural economics. I find it really interesting how people respond to incentives and how people modify their behaviour in response to incentives.

E - What would be a dream course to teach?

M - A course very, 100%. I think that it’s a mechanism through which you can evaluate a lot of different disciplines. Obviously you can teach immunology, virology, and bacteriology. If you think about commercialization and development: what are the pipelines these therapeutics need to go through in order to make it to the market (and) what are the incentives that make people invest in vaccines for flu and not necessarily vaccines for Ebola or some of the (other) neglected tropical diseases. A vaccine is also a really interesting way to study psychology and policy. I think it’s a lens through which you can actually study a lot of different disciplines.

E - If you could go back into the lab right now, what would you want to work on?

M - If I didn’t work on flu, I think a pathogen that I would be interested in working on is tuberculosis. I think that’s true for a lot of the same reasons that I think flu is interesting is that we’ve studied it for a long time, there is a vaccine, and it doesn’t work very well. So I think I would work on TB vaccines or tuberculosis in general.

E - What would be advice that you have for your undergraduate self?

M - Don’t limit yourself in terms of the subjects you pursue. Pursue things that maybe you’re not good at or maybe seem difficult at first. Because you only get to do this one time. You should really take the opportunity to expand into subjects and disciplines that maybe at first you weren’t inherently drawn to.

E - What is your favourite TV show?

M - The Office, 100%. And I can re-watch an episode that I have seen 30 times and still laugh.

E - What would be a favourite or a really unique Hamilton restaurant that you have to be since you have been here?

M - I mean there’s a lot of great ones. I would say that my favourite right now is Born and Raised. But adventurous eaters should check out Kapscallion (Roque Eatery). We’ve gone there and eaten crickets, hearts, tongues and things like that.

E - Is there anything that you would want Health Sci to know about you?

M - I am probably more approachable than people think. I feel like by reputation, people might perceive me as stand-offish. But I love to talk about science (and) I love it when students drop by for office hours. I’m always happy to meet with people to chat and I am very invested in interacting with students in the program.

E - If you could go back and change anything from this year, would you?

M - I don’t think I would change anything. I really enjoyed my first year. I really enjoy being a part of the BHSc program. I think it’s a fantastic community. Did everything run perfectly and smoothly? No! But, what does?

E - What is the most interesting thing about the BHSc program for you?

M - I constantly think about how lucky the students in this program are because there is an incredible network of support in place for them (and there) are a lot of fantastic professors in the program. And the students impress me. You have this small cohort of students (that) get to interact with peers who are equally intelligent, hardworking, ambitious. That’s what stands out about the program to me. It is such a unique opportunity and I’m glad to be a part of it.
The BHSc (Honours) Program is delighted to welcome Dr. Jennifer Nash as an Assistant Professor, as of September 1, 2017.

Jennifer is not only an experienced instructor and facilitator in the Program, but she is also an alumna, having graduated with her BHSc (Honours) degree in 2004. She subsequently became a chiropractor, and has worked in a multi-disciplinary practice while serving in a variety of roles in her provincial and international professional associations, as well as teaching in BHSc since 2011.

“I have a passion for teaching, and I’m continually looking for opportunities to further develop the courses I’m involved in and other aspects of the program”, she says.

With her background as a chiropractor, she is especially interested in musculoskeletal health, non-pharmacological pain management and interdisciplinary education, and will continue to serve as a liaison person between the BHSc (Honours) Program and the Program for Interprofessional Practice, Education & Research (PIPER) in the Faculty of Health Sciences.

Jenn believes that “learning is not a passive process, that students and facilitators should not be passive participants,” and largely sees her role as one of facilitator rather than instructor. “A facilitator helps students take an active role in identifying their learning goals, and helps them identify opportunities, challenge assumptions, collaborate with others, and think critically,” she says.

For 2017-18 Academic Year, Jenn will be teaching and facilitating in a number of courses in the BHSc (Honours) Program, continuing as a facilitator in HTHSCI 1E06 – Inquiry I, HTHSCI 2F03 – Health, Attitude, & Behaviour, HTHSCI 3X03 – Pain: Perceptions, Mechanisms, & Management, HTHSCI 4S06 Group Process Practicum and 4EE3 Education Practicum in Health Sciences which she has taught for a number of years. In addition, she’ll be leading the changes in HTHSCI 4F03 – Clinical Practice Environment, and helping to update and create new course offerings.

In reflecting on her experiences as a student in the program, Jenn thinks she only spoke twice in her first year Inquiry course! Certainly, as an alum Jenn can relate to students’ experiences as they immerse themselves in Inquiry for the first time, and help them to get the most out of it. She’s been there and knows what it’s like first hand.

“Teaching is not a one-way street and learning is messy,” Jenn notes. “My motto is, ‘everything in moderation…except cupcakes and questions. These are always fair game.’”

The BHSc (Honours) Program is delighted to welcome Dr. Eric Seidlitz as an Assistant Professor, as of September 15, 2017. Eric has been an instructor in the BHSc (Honours) Program since 2011, contributing to teaching in the basic sciences in a variety of roles. Originally from Portage la Prairie, Manitoba, Eric completed undergraduate degrees in biology and psychology at the University of Manitoba and a master’s degree in psychology before doing his Doctorate in physiology and pharmacology in the Medical Sciences PhD program here at McMaster.

Eric doesn’t see learning as the outcome of teaching. “Learning is the result of engagement with concepts and ideas in a way that promotes understanding,” he explains. “Teaching is my method of fostering this engagement.”

He’ll be playing a number of roles for 2017-18 Academic Year. He will be an instructor and facilitator teams for the 2nd year inquiry course (HTHSCI 2F03 – Inquiry: Biochemistry and HTHSCI 2K03 – Inquiry: Cell Biology), and will also work with Chari in HTHSCI 1N66 – Cellular & Molecular Biology. This fall, Eric is also teaching a first-year elective course, HTHSCI 1K03 – Health Sciences & the Media, an exciting opportunity for students from across the university to explore the relationships between popular media representations of discoveries in the health sciences and the original research behind them. He’ll also be taking the lead in some important curricular developments to support student readiness for research. When he’s not teaching, Eric enjoys spending his creative time as an amateur photographer and a stained glass artist, and as a former pilot he unsurprisingly watches every aircraft that flies by.

Eric has been part of the BHSc community for some time, and I’m excited about how this new role will enable him to contribute to the ongoing evolution of the program.

I teach because I know that I can make a positive difference for students,” Eric says. “I see my role primarily as a coach, with students as my clients.”

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Larry was the Co-chair of Unit One in the MD Program, for several years in the late eighties. Part of my mandate was getting enough tutors for that Unit. In those days, there were no stipends for tutors, and many were very busy either with their clinical duties or research, so getting enough to manage the Unit was far from easy. Larry always accepted with alacrity. He was an excellent tutor genuinely interested in the welfare of the students. I appreciated tapping into his deep knowledge of both physiology and pharmacology.

Larry was involved in several courses in the BHSc (Honours) Program that focused on anatomy and pathophysiology (2F03, 2F05, 4K03, 4K05) and always very busy either with their clinical duties or research, so getting enough to manage the Unit was far from easy. Larry always accepted with alacrity. He was an excellent tutor genuinely interested in the welfare of the students. I appreciated tapping into his deep knowledge of both physiology and pharmacology.

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He received accolades from his students who commented on his enthusiasm, patience, knowledge and abilities to foster their learning. “Dr. Belbeck” said a student, “was one of a kind.” He truly was. Larry was involved in several courses in the BHSc (Honours) Program that focused on anatomy and pathophysiology (2F03, 2F05, 4K03, 4K05). He brought to those activities, the same degree of enthusiasm and interest he had always shown. When one of the Groups in HTHSCI1106, wanted to design a drag to control lust in dogs as part of their UNSIN project, I passed them onto Larry who provided them invaluable help.

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LARRY BELBECK: “ONE OF A KIND” AN APPRECIATION
By: B.K. Rangachari, Professor Emeritus, BHSc, (Honours)

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There are numerous ways in which McMaster students can take advantage of studying abroad, one of which is through the McMaster Exchange Program. "Studying abroad is the experience of a lifetime. Push yourself beyond your comfort zone and take advantage of the personal and global learning that comes from a study abroad experience," https://iss.mcmaster.ca/learningabroad/outgoing-exchange/. If you are interested in exploring the possibility of studying abroad, please visit the link above for more information and/or contact the BHSc office for assistance.

I learned more about myself in those first few months than I had throughout my entire time in high school. I thought it would be good to try the process again, and so I signed up for exchange! It was an even bigger adjustment than first year because I am now in a foreign county, surrounded by the sounds of a strange language, and even farther from home. However, I could not image my life without this new and exciting experience. I have made life-long friends and travelled to places I never thought I would go!

Overall would you recommend the exchange program?  
Yes! Absolutely! 100%! No hesitation.

What is the most important thing that you took away from this experience? 
The main thing I have learned is just how valuable having an open mind can be. Exchange is full of challenges, and things do not always go as planned, but when you are willing to adapt and just be present, it can change your whole attitude towards the situation. I have met so many new people, and experienced so many different cultures, that being able to adjust to my surroundings has made my experience abroad much more enjoyable. I wanted to meet people from all over the world and learn about their culture and lifestyle. By not being opposed to trying new things, or not being deterred by the thick accents that make communicating more difficult, it has been a very interesting and eye opening experience.

How did your studies abroad differ from your time at McMaster? 
The schooling abroad is very different than back at McMaster. There are no deadlines, tests or assignments. I only have one final paper worth 100% or an oral exam worth the same amount! The use of oral exams is quite novel as there are no right or wrong answers! You are able explain and rationalize your thoughts. You are given a question and you have half an hour to prepare a fifteen minute answer. Another startling difference is that your grade is given a mere five minutes after your oral exam!

I was the first time I had been away from my family for more than two weeks! I had to start from scratch. I did not know anyone, or just how much work university was going to be. I had throughout my entire time in high school. I thought it would be good to try the process again, and so I signed up for exchange! It was an even bigger adjustment than first year because I am now in a foreign county, surrounded by the sounds of a strange language, and even farther from home. However, I could not image my life without this new and exciting experience. I have made life-long friends and travelled to places I never thought I would go!

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Getting “Dolled Up” with Katarina Poletto
BHSc Alumna, Class of 2016

Overview: Dolled Up Desserts is Hamilton’s award winning gluten free and vegan wholesale baking manufacturer. We make simple baking mixes and delicious treats for the not so simple diet, so you can enjoy dessert simply. By providing professionally crafted, verified allergen free baking mixes and baked goods, we help give the power over the enjoyment of baking and food back to people with dietary differences. Confidence is in our cake.

What lead you to pursue your current career path?
I started Dolled Up Desserts as a fun summer project fresh out of BHSc with the support of the Summer Company program operated by the Small Business Enterprise Centre. Summer Company is a micro grant and business mentorship opportunity for students aged 16-29. That fall of 2016, I planned to attend grad school at the University of Chicago for social work on a scholarship, which was my dream. Baking and innovating recipes has always been a fun past time, and I intended to start a bakery one day, but not before I saved the world of social injustices, etc. I thought I would attend a few farmers markets and events that summer, and then no one would miss me by the time September rolled around. Within one month I began wholesaling baked goods at a few local coffee shops and the Union Market at McMaster University. By the time the summer was over, I had already made a lasting market impression in Hamilton and Toronto. The universe was essentially showing me that the entrepreneurial path is the way to go, and I decided to pursue it, full force.

What inspires you?
With regard to entrepreneurship, I am inspired by other food entrepreneurs. I have made many connections with other female entrepreneurs with their own food start-ups, and I feel encouraged and inspired by the other extraordinary women who are either a couple years or decades ahead, and I feel their energy was meant for me years ago. I remember my first chemistry mid term mark at 70%, and I actually thought of being a physician was OVER! I was so afraid to veer off my plan, but if it wasn’t for letting life happen, I never would have started my company and impacted the lives of so many people with dietary differences.

Where do you see yourself in the future?
With regards to Dolled Up Desserts, I want to scale our line of premium baking mixes to become an internationally recognized house hold brand- think the modern Betty Crocker. In addition, I would like to have an established cafe/bakery in Hamilton that shares the most innovative gluten free and vegan baked goods and food experiences with the world. I want people from across the globe to enjoy the amazing city I call home. My role in this would likely turn down the opportunity to even start a summer company if it wasn’t for the personal growth I experienced in BHSc to openly experiment with new opportunities and explore challenges that might not be according to plan. I am proud to say I have no experience in accounting, book keeping, the legal world, management, the food industry, quality control, sourcing, HR, economics or scaling a business, but equipped with my skills in defining research questions and evaluating evidence based data from a variety of sources, as well as the skills of being able to give and apply feedback, I teach myself daily how to be a better CEO.

Over the course of the last year and a half, more than I could have ever imagined has happened. I started a line of premium baking mixes. My experience with baking for my own dietary differences taught me that empowerment over your allergies comes from being able to easily cook/ bake for yourself in a way that you feel proud of sharing. Our baking mixes are now sold in over 40 retail locations in Southern Ontario and British Columbia. I purchased a historic building in downtown Hamilton with a private investor with the intent of recovering its beauty and function as our headquarters for production, and possibly other features (could be retail, community event spaces, entrepreneurial peer support and even my residence). My company won various craft- and entrepreneurial-related awards: The Toronto Vegan Bake Off for our Lavender Lemon Shortbread Cookie; Hamilton Spectator Readers Choice for Best Vegan Food; and the Hamilton Award for the Lion’s Lair Pitch Competition. Lion’s Lair is a city-funded version of Dragon’s Den, except instead of investors owning your company; cash and in-kind prizes are awarded to local start-ups with the best pitch. The Hamilton award is presented to the business that best represents the city’s flourishing economic ecosystem; a business that is as proud of developing their city, as the city is proud of supporting.

I hired and now collaborate with seven beautiful people who make Dolled Up Desserts more vibrant. They contribute significantly to expanding our established operations and logistics, giving me more time to focus on growth!

If you could give advice to your first year self, what would it be?
Don’t be afraid to let life happen. In first year, I was determined at all costs to follow the plan I/my parents had set for me years ago. I remember my first chemistry mid term mark at 70%, and I actually thought of being a physician was OVER! I was so afraid to veer off my plan, that when life decided to throw me the biggest challenges I ever had faced in second year, I actually made myself more mentally sick because I wasn’t letting the universe show me the way. Of course it is important to have a goal of where you want to be (I have many) but I learned through third year, fourth year and then now as an entrepreneur that you are always growing. The idea of who you were and what you should do may not reflect what your energy was meant to achieve in the moment. I am still learning to let go and embrace all opportunities life throws at me- its a constant struggle against anxiety of the unknown. But if it wasn’t for letting life happen, I never would have started my company and impacted the lives of so many people with dietary differences using my talents.

How did your experience in BHSc prepare you with respect to your current path?
The skills we constantly work on in inquiry, better known by students as the six P’s, prepared me to have the flexibility, stamina and self awareness to be a young entrepreneur. I would have likely turned down the opportunity to even start a summer company if it wasn’t for the personal growth I experienced in BHSc to openly experiment with new opportunities and explore challenges that might not be according to plan. I am proud to say I have no experience in accounting, book keeping, the legal world, management, the food industry, quality control, sourcing, HR, economics or scaling a business, but equipped with my skills in defining research questions and evaluating evidence based data from a variety of sources, as well as the skills of being able to give and apply feedback, I teach myself daily how to be a better CEO.
What led you to pursue your current research?

One of the worst feelings in the world is not being able to breathe normally. When I was a child, I remember waking up in the middle of the night because of my asthma. My chest was tight, I was wheezing, and I could barely breathe, let alone talk. I remember being so scared that I asked my dad, “Am I going to die?”

I was only six years old.

On several different occasions, I had to be hospitalized, including once at SickKids in Toronto.

When I came to BHSc, I learned of Dr. Malcolm Sears, a renowned respirologist and epidemiologist based at St. Joseph’s Healthcare Hamilton. By this time, my asthma was well-controlled, but I didn’t want young children to have the same experience with asthma that I did. Dr. Sears was the Director of the Canadian Healthy Infant Longitudinal Development (CHILD) Study, a national birth cohort of 3,500 families that aims to determine the root causes of asthma and allergy. I reached out to Dr. Sears and told him about my personal connection to his research. He kindly agreed to let me become a research volunteer—and later, he gave me my first research job. I worked for two summers under his supervision, with funding from the Allergy, Genes and Environment (AllerGen) Undergraduate Summer Studentship.

Now that I’m in medical school at the University of Toronto, I’m excited to continue working on the CHILD Study in Toronto. Toronto is one of the four study sites, and I’m excited to continue working on the CHILD Study project for the next two years. CHILD also gave me the flexibility to extend my 3rd year summer research project into the school year, allowing me to work on the CHILD Study during my thesis.

What has your research found?

The overarching question that fuels my research is, “Why do children develop allergic disease while others do not?”

Our first paper in Pediatric Allergy and Immunology examined the effect of timing of food introduction on allergic sensitization to foods (which can be a precursor to food allergy) at age 1. In an analysis of over 2,100 children, delayed introduction of cow’s milk products, egg, and peanut, beyond age 1, significantly increased the risk of sensitization to the corresponding foods. These findings align with new feeding guidelines, which promote earlier introduction of potentially allergenic foods.

Our second paper in Journal of Allergy & Clinical Immunology examined the concept of the atopic march: the progression from atopic dermatitis (eczema) during infancy to asthma and allergic rhinitis (hay fever) in later childhood. Using data from over 2,300 children, we found that having atopic dermatitis at age 1, in the absence of allergic sensitization, did not increase children’s risk of developing asthma at age 3. However, children with atopic dermatitis and allergic sensitization, were seven times more likely to develop asthma, compared to children without either risk factor. These children were also more likely to develop a food allergy. Hence, the combination of atopic dermatitis with allergic sensitization at age 1 can potentially be used to predict children at risk of subsequent allergic disease.

How did your experience in BHSc prepare/inspire you with respect to your research?

There were definitely a couple of practical benefits. My research was dry lab, so taking Epidemiology, Statistics, and Critical Appraisal of the Medical Literature (CRAP), helped immensely. The material that we learned in class was directly applicable to my projects. CHILD also gave me the flexibility to extend my 3rd year summer research project into the school year, allowing me to work on the CHILD Study during my thesis.

On a more philosophical level, courses like Inquiry, 2A3E, 3CC3, 3N03, and others, helped me become a self-directed learner, navigate uncertainty, and respond to feedback. That's exactly what you need to do in research. If you don't know how to do something, then you have to find a way to learn, by reading textbooks, searching online, talking to colleagues, or some other method. There are also a multitude of things that can go wrong, whether it’s funding, ethics, experiments, stats, etc. So that's where being able to handle uncertainty becomes extremely useful. Lastly, BHSc prepared me to accept, understand, and implement constructive feedback. Publishing is rarely smooth sailing. Our first manuscript was rejected several times before it was accepted. Each rejection was heartbreaking, but we used the feedback from reviewers to substantially improve the rigour of our research and the quality of the writing.

If you could give advice to your first year self, what would it be?

My advice to my first year self would be: Don’t be afraid to explore what you’re interested in, and don’t care so much about what other people think. BHSc is an amazing community but there can often be a pressure to conform to the “group norm”. The question shouldn’t be, “Should I do X because everyone else is doing it?”, it should be, “Should I do X because I genuinely want to do it?” If the answer to the latter question is yes, then by all means you should do X. Otherwise, your experience may not be everything you hope for.

Along the same lines, if you’re interested in art or entrepreneurship or sports, pursue those interests. Our interests, especially our extracurricular interests, are what keep us human. University is the best time to try new things, challenge the way you think, and expand your comfort zone. I learned more outside of the classroom than I did inside it. But in terms of classes, if you really want to take English or Music, do it – even if others question your decision. I remember other students asking me, “Why are you taking English? It’s not a prerequisite for anything.” I took English because I missed reading, critically analyzing texts, and writing essays (honest). As hard as the course was, I did better in English than I did in any “bird” course that I took. You’ll always tend to perform better in an activity or course that you care about.

Anything else that you would like to share with the BHSc Community?

There are so many memories that stand out from my time in BHSc, but if I had to pick some…silences in first year Inquiry; dinner nights with friends; playing basketball; Ink Movement Hamilton; eating poke at the Farmer’s Market; the group project in 3DD3: learning about design thinking in 4ID3; coming full circle to TA for 2J03 and peer tutor 1E06; and last but not least, the enormous portion sizes at Bistro.
Ontario Women’s Health Scholar: Sophie Poznanski
BHSc Alumna, Class of 2016
Compiled by: Andrea Phair, Academic Program Advisor/Curriculum Coordinator, BHSc (Honours) Program

What led you to pursue your current career path?

As early as high school, I have been very interested in the physiology of the human body and its intricate regulation of physiology. Since then, I have developed an interest in health and working towards finding solutions for improving health conditions. I enjoy problem solving and was drawn to the innovative aspects of medical sciences research as it draws on constantly evolving scientific knowledge to improve treatments and consequent outcomes of diseases.

How did your experience in BHSc prepare/inspire you with respect to your current path?

In hindsight, the first indication that research would be a good path for me came in 2nd year through the inquiry-based Biochemistry (HTHSCI 2E03) and Cell Biology (HTHSCI 2K03) courses. In these courses, we had to use knowledge of biochemistry and cell biology to propose a novel therapy for a certain disease. I enjoyed this challenge and particularly the inventive thinking required, which (although I did not realize at the time) is essentially the type of thinking used in research. The immunology courses offered by BHSc were really what captivated my interest in immunology and as a result, I pursued a 4th year thesis project in Dr. Ali Ashkar’s lab. I did not have much lab experience, and while immunology interested me, I did not know whether I would enjoy the wet-lab aspect of research.

This 4th year thesis project gave me an opportunity to try out lab work before deciding whether to pursue a graduate degree in medical sciences research, and I quickly realized how much I enjoyed the hands-on aspect of research.

Briefly, tell me a bit about your project and the award.

My project looks at arming Natural Killer immune cells, known as NK cells, as a novel treatment for ovarian cancer. Ovarian cancer is the deadliest gynecological cancer with the majority of affected women not surviving 5 years past onset, due to a lack of effective treatments. NK cells have the capacity to kill cancerous cells without harming healthy cells in the body and thus, hold a lot of promise as a cancer therapeutic. However, the immune cells of cancer patients typically develop impaired function, which prevents them from attacking cancerous cells. To overcome this impairment, my project uses a method of NK cell activation to arm ovarian cancer patients’ own NK cells against their cancer. Using a lab model of the patient’s own ovarian cancer, the therapeutic effects of these armed NK cells on the tumour are also assessed.

The Ontario Women’s Health Scholars Award is presented by the Council of Ontario Universities to Masters students, Doctoral students, and Postdoctoral fellows whose research demonstrates potential to improve women’s health. Various criteria are considered including the nature of the project, CV, and transcript.

What made you decide to pursue this project, and what excites you the most about it?

The human immune system is fascinating. In addition to protecting us from pathogens, it plays an integral role in countless physiological functions in the body. Understandably, it is implicated in numerous diseases, including cancer. I am really interested in translational research, which uses knowledge of how the immune system functions to form new therapies. An exciting part about this project is its clinical relevance. We arm the NK cells of ovarian cancer patients and assess their effectiveness in reducing the tumour burden of the respective patients. If proven effective in humans, these findings could have a beneficial impact for women with ovarian cancer, a disease which currently lacks effective therapies. This therapy could also be applied to treatment of other types of tumours that are currently difficult to manage. It is exciting and motivating to be working on something that holds promise for clinical application.

What did you learn as a BHSc student that is important and/or useful to you in pursuing your research?

BHSc certainly played an instrumental role in both developing my interest in research as well as preparing me for it. As I mentioned, I really enjoyed the second year, inquiry-based Biochemistry and Cell Biology courses, in which we had to use knowledge of cell biology and cell signaling to propose a novel therapy for a certain disease. That sort of problem solving and application of knowledge, which is a component of many BHSc courses, is very similar to the problem solving involved in research.

A lot of the learning in BHSc is also self-directed which can be similar in research, and I learned through my time in BHSc how to plan and direct my learning in an efficient way. Research is also a team effort and involves a lot of collaboration. The group work involved in many BHSc courses prepared me well for this – it taught me how to work in different group dynamics and how to communicate effectively.

If you could give advice to your first year self, what would it be?

Things don’t always go as expected. Life threw me a curve ball in my first year of university, and it taught me the importance of being adaptable and open to different, maybe unexpected, opportunities that may present themselves.

Anything else that you would like to share with the BHSc Community?

Robert Frost’s famous poem, “The Road Not Taken”, resonates with me in many ways. Particularly the last few lines:

“Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.”
Few undergraduate programs offer students the opportunity to publish an academic discussion on the underpinning of their very own classrooms. We are fourth-year BHSc undergraduate students who published an article in Advances in Physiology Education titled, "Effort & Trust: The underpinning of active learning in our program’s model of problem-based learning (PBL), specifically with reference to the foundational global health course HTHSCI 2Q06: Patient Care in a Historical Context." The paper, structured in the form of a conversation, sought to understand how instructors must trust that students will put forth a sufficient degree of effort towards their education in PBL courses and how students trust their facilitators to support them throughout their learning.

One of the primary objectives of HTHSCI 2Q06 was to introduce students to the realm of "personomics" – first described by Sir William Osler, one of the founding fathers of modern medicine, as having an understanding of who your patient is rather than what disease they had (1). Throughout the course, this "knowing your patient" philosophy was repeatedly emphasized in discussions of polio, tuberculosis, and independent projects, all of which provided students with the opportunity to explore the social, economic, environmental, and political determinants of health.

This multi-sectoral approach demanded us to step outside of our biases, and value the unique perspective each stakeholder contributes to develop a holistic understanding of an issue. This course was a space where students were encouraged to engage in discussions that critically analyzed the development of the healthcare system and the social factors that contribute to the health of populations. Considering the continuing globalization of various sectors of our society, and the multiculturalism of communities, especially in Canada, it was worth taking the time to engage in these dialogues and discuss the implications of systemic practices on the development of the patient-physician relationship, which is arguably the center of clinical practice.

Using a problem-based learning approach, 2Q06 emphasized the importance of self-directed learning to seek and answer our own questions. This course provided valuable lessons not only in the form of global health knowledge, but also transferable skills that have shaped us into stronger students. Generally, we are more confident in our ability to collect and synthesize information when researching topics we are not familiar with, and reflexively draw connections and parallels between various perspectives when considering an issue in healthcare. With the extensive amount of group work that students participated in, they are better prepared for the type of information. The emphasis placed on learning with and from our peers reinforced our intrinsic desire to learn for the sake of learning rather than pursuing a certain grade.

Though we understand the tremendous value of a PBL education, balancing such courses with didactic coursework is a challenge most BHSc students have encountered over their years in the program. We often asked ourselves:

- When am I done my research? How much work is enough?
- What does the instructor expect?
- How do I know when I have completed a task?
- How do I manage my time?
- What is the best way to approach an assignment?
- How do I stay organized?
- How do I determine when I am ready to move on to the next step?
- How do I manage competing priorities?
- What is the best way to engage with my peers?
- How do I balance learning and work?
- How do I maintain a healthy perspective on my own learning?
- What is the best way to approach a difficult problem?
- How do I stay motivated?
- How do I stay focused?
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“CELLING” SEX, TO A BIOMEDICAL SCIENTIST, IS NO EASY FEAT

By: Krishnan Shyamkumar, BHSs (Honours), Class of 2020

In 2014, the National Institutes of Health declared that all preclinical studies seeking funding had to include both male and female cells and/or animals (1). The cause for such action is understandable: biomedical research is mostly conducted on male subjects, thereby limiting the extent to which findings can be generalized to females (2). In a way, the policy compels scientists to incorporate sex as a variable in their experiments, with the hope that such considerations will lead to a more comprehensive understanding of biological research (3). Comparing a male living system to an equivalent, female living system can appear to be a simple way of accounting for sex. However, Dr. Stacey Ritz expresses that implementing this approach is often difficult with the current practices of laboratory research, especially when working with cell cultures. As well, whether in vitro systems can adequately model sex is questionable, and treating sex as a singular entity (as opposed to a collection of characteristics) that instantiates as either “male” or “female” may perpetuate the notion that any differences will be innate, and need not be explored further (2).

Although the terms, “sex” and “gender,” seem interchangeable, it is only the former that refers to the biological characteristics (e.g., chromosomes, hormone levels, reproductive anatomy and processes, etc.) typically differing between male and female bodies. In contrast, “gender” is related to the socio-cultural aspects of what it means to be “masculine” or “feminine,” considering, for example, how one behaves and dresses, their occupation, etc. It is the interplay between factors of each nature that gives rise to a male-female difference (4). For instance, bone density is easily thought of as a biological trait, and therefore strictly influenced by sex (2, 4). Indeed, the presence of sex hormones is a determinant of bone density, but so too is exposure to sunlight (which promotes vitamin D synthesis, and in turn, increased absorption of Ca^2+), or engaging in weight-bearing activities; these can vary according to how one dresses or what they do for a living, in addition to other gender-related factors. Thus, awareness of the distinction between sex and gender can begin an appreciation of how processes are modulated by both biological and social factors, which do not necessarily stay the same among persons who are “male” or among those who are “female” (4). Unfortunately, the question of how to address sex and gender in an experimental setting does not have a clear answer. Being a cultural construct, the inherent complexity of gender hinders efforts to keep an experiment as simple as possible (4). There are also unique challenges to the consideration of sex in vitro, including practical and conceptual issues (2).

In vitro research uses cells that are obtained directly from an organism (i.e. a primary cell culture) or transformed cells, which are able to keep dividing owing to their preparation from cancerous tissue or deliberate alterations in the lab (2). With regards to the latter, “equivalent” cell lines from male and female sources do not exist, and are perhaps impossible to create (3). When derived from a spontaneous cancer, the transformed cells will essentially be one of-a-kind; in other words, while it may be workable to establish cell lines with similar characteristics from both male and female donors, variations between the cancers and the donors themselves (e.g., different ethnicities) could just as well contribute to a difference in cell response as compared to sex (2, 4). Slightly more promising is the use of animals of an inbred strain to create male and female transformed cell lines through identical means. However, differential selection pressures in the two cell culture environments can still result in uncontrolled variability (2). Furthermore, the fact that such cells are far from being “normal” raises the concern of whether they are even “representative” of either males or females (3). These hurdles may be avoided if one instead uses primary cell cultures—and for that matter, is also willing to embrace the accompanying resource- and time-intensive practices (2, 4). Besides the material difficulties associated with comparing cells from male and female subjects, such an approach fails to comprehensively address sex due to the limitations of the in vitro environment. Recall that “sex” is best described as a collection of characteristics, which manifests across several levels of organization, ranging from genes to organ systems. Only those differences in sex at the cellular level are captured in vitro. In removing the complex input of a cell’s native microenvironment (the status of which can vary according to sex-related factors and the animal’s social experiences), we invite the possibility that the cell may respond quite differently to the same stimulus in vivo. In other words, if similar responses are observed from male and female cells, it is possible that the differential aspects of sex persisting in vitro do not modify the response; however, it doesn’t necessarily follow that the question of sex (in its entirety) is resolved (2, 4).

Despite the multifaceted nature of the “collection” that is sex, there is a tendency to assume that such biological characteristic of this “collection” adopts one universal configuration or the other, and that such configurations are always grouped in the same, fixed manner into two categories. For example, when we classify an animal as male or female, we might inspect the external genitalia to determine its sex, and presume the other signifiers (like the chromosome complement or sex hormone levels) are also in agreement. Where the observed aspects of sex don’t match the male or female prototype, we consider those cases to be rare. In fact, these “anomalies” remind us that there is no necessary correlation between the characteristics we deem relevant to determining sex, and that the “collection” is not uniformly male-like or female-like. When we conceptualize sex as a binary trait, we almost expect to see a difference upon executing a controlled comparison, which can lead to overestimations and compels us to subscribe to the bias that any differences are inherent to being biologically male or female. As Dr. Ritz says, “it is never the abstract construct of maleness or femaleness per se that confers any differences we might observe in a male-female comparison—it is some particular aspect of the constellation we call male or female that does so, and in principle we should be able to identify precisely which aspects those are and generalize that understanding beyond a simplistic binary.” To better appreciate this idea, consider the following result from a hypothetical in vitro experiment: gene X is upregulated to a greater degree in female cells than in male cells when they are both presented with stimulant Y. Choosing not to leave it at that, we investigate why this may have occurred and find that the response is mediated by testosterone receptor expression (typically higher in males). Thus, we are able to draw a more nuanced conclusion and say, “individuals with lower expression of the testosterone receptor produce more X in response to Y” (2).

According to Dr. Ritz, these critiques of male-female comparisons are not intended to dispute calls asking scientists to address sex (and gender) in their work. Rather, they are meant to illustrate that these directives are not enough, and that we must remain critical of our conceptual orientation to sex, the caveats of our experimental models, and the manner in which we interpret our observations (2). For aspiring and current biomedical researchers who may take up sex considerations in their research, the obvious first step would be to further one’s existing knowledge of such issues and engage with contemporary discourses of sex and gender (2, 4). To the undergraduate readers, perhaps the ideal setting for this endeavour is HTH Summer Students Program in Gender, Health, which debuted this year and is instructed by Dr. Ritz herself.

References
Below are some questions answered by Chelsea Mackinnon regarding intergenerational research.

Please give a brief description of your research. Where have you and your students published or presented the research?

I will be describing the research conducted in the context of Music, Health, and the Community (MHC). What is really exciting about this research is it is student driven and provides interested BHSc students with opportunities to engage in exciting about this research is it is student driven and provides interested BHSc students with opportunities to engage in music and health research!

Social Isolation and Depression Study

• An MHC student who took the course first term of last year (the first time it was offered) was very interested in her study design and wanted to complete the study as her fourth year thesis project. During Term 2 of her third year, she completed a project course in order to set up the study, including ethics approval, recruitment, finalizing design, and a literature review. The student left after third year to go to medical school, but the study still went forward. Alumni, Jenna Schloff, and Matthew McArthur, a fourth-year student, now coordinate the ‘intervention’, our Fountains of Uke music program that students run in the community, facilitating intergenerational interactions.

Thematic Analysis of Children’s Perceptions

• This study was completed by a 3MU3 community group; they collected statements from student participants and analyzed the comments to determine themes from the student perspectives.

Preliminary Findings

• The study was presented by former MHC students Paolo David and Dilshan Pieters at the Ontario Music Educators Association conference in Huntsville in October. It was presented before any outcome data could be analyzed, but we wanted the Ontario Music Educators to be aware of the study and how children’s music education was being uniquely influenced through this study.

Why is this research important?

There are many layers of importance to all of this research. First and foremost, we want to ensure that programs we are delivering are evidence-based, and beneficial to Hamilton community members (including long-term care/retirement residents, elementary students, and high school students in our new program Millennial Music). Next, we want to provide educational opportunities for McMaster students in the BHSc program to grow their research and inquiry skills. Finally, in order to gain buy-in from key stakeholders and other community members, we must have research evidence to show that this use of music in health settings is valuable and beneficial.

What made you interested in intergenerational research? What made you wish to pursue this line of research instead of the anatomy-related research that you conducted during your undergraduate years?

Great question, and to be honest, it was kind of a total fluke. I am very thankful for my undergraduate work with Dr. Bruce Wainman. To this day, he is still an important mentor of mine and has taught me foundational research skills that were critical for me to get to where I am today. The link between my anatomy research and my intergenerational research is that they are both educational in nature. So, I guess I could say my research area is education. During my first MA degree and currently at my workplace, I conduct primary research on musical applications in healthcare. At McMaster, all my research is on the trajectory of ensuring that delivery of the Fountains of Uke program—through McMaster coursework and within the Hamilton community—is the best possible program it can be. I think as an educator and as a provider of services to Hamiltonians, I have a duty to do this type of research.

What have been the most challenging and rewarding aspects of your research process?

I think one of the biggest ‘aha’ moments I have had is how much project management and supervision goes into the research process. It is very rare that a research investigation occurs with only one investigator; this time and energy can be overlooked. In my current Master’s degree, I am taking a project management course, which has been extremely helpful in managing the various research investigations I have going on and in the works.

What have you learned from your research investigations? Has anything surprised you during the research process?

In terms of something surprising, I have been surprised a few times this year at how ‘inaccessible’ research is perceived to be, by students. Yes, there are complex components in any well-designed research study, but the research process itself is, in essence, a logical stepwise framework. One of my goals as an educator is to help the students I work with see themselves as able to ask good questions and follow through with good research process, from beginning to end.

To learn more, please contact Chelsea Mackinnon at mackinnon.chels@gmail.com
As society grapples with novel challenges in healthcare, industry, and the environment, finding solutions through unique approaches becomes important. The International Genetically Engineered Machine (iGEM) competition focuses on tackling issues through the field of synthetic biology and so too does the iGEM McMaster team.

Each year, over three hundred international teams gather, collaborate, and compete at iGEM's annual Giant Jamboree in Boston, Massachusetts. In preparation for the Jamboree, the iGEM McMaster team works during both the academic and summer months to design and complete a novel project. Through the team's three-year history of competing, it has continually empowered its members to engage in wet and dry lab research, explore world-gripping issues, and understand the role of science and biotechnology in societal systems.

For the 2017 season, the McMaster iGEM team explored the field of antimicrobial resistance, a locally and nationally prevalent issue. The team collaborated with the Li Lab to use fluorogenic DNAzymes as an accessible and rapid diagnostic tool to identify different bacterial strains. The data collected from the lab was then utilized to create computer models of various DNAzymes. To understand the implications of this research, they also met and discussed with experts working in research, healthcare, and policy development, including the Mayor of Hamilton.

These fluorogenic DNAzymes are single-stranded functionalized DNA capable of fluorescing in the presence of its respective bacterial strain. The McMaster iGEM team has focused on optimizing a DNAzyme that detects the E. coli K12 strain. In addition to its ability to identify specific strains, the intensity of fluorescence can be used to quantify the amount of bacteria present in a given sample. The long-term application of this novel approach to early pathogen detection could enhance the ability to respond to disease outbreaks from infectious bacteria.

At the Jamboree in November 2017, iGEM McMaster showcased their findings through poster presentations and plenary talks attended by both judges and other teams. This cross-talk between iGEM teams also lead to immense opportunities to learn from the diversity and interdisciplinary nature of synthetic biology and potential projects. Friendships with other universities were also established, creating a great network of scientific collaboration for the 2018 season. Thought-provoking panels led by industry experts, such as talks on biosafety and dual-use by FBI representatives, and participation in activities promoting scientific creativity, helped to foster further learning.

At the international Giant Jamboree, the team was awarded a bronze medal as a result of their effort and dedication to the advancement of science. iGEM McMaster is a club which has grown immensely over the years, and as they transition into the new year, they look forward to exploring deeper into their field of interest.

While reducing the prevalence of smoking on campus benefits the physical health of both smokers and non-smokers, there is controversy regarding its fairness towards smokers. When an individual is repeatedly exposed to an addictive substance like tobacco, they undergo neurological changes that causes dependency. Smoking not only affects the individual, but also others. It has been reported that secondhand smoke increases the risk of acute myocardial infarction by 25% to 31%, even in low concentrations (4).

The student population is comprised largely of the youngest target population for the tobacco industry and the age group with the highest smoking prevalence rate (daily and non-daily smokers) in Canada (18.5%) (1, 2). Research has shown that smokers who quit before the age of 30 almost eliminate their risk of mortality due to smoking-induced causes (3). Smoking not only affects the individual, but also others. It has been reported that secondhand smoke increases the risk of acute myocardial infarction by 25% to 31%, even in low concentrations (4).

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A little more than a decade ago, a small idea for a 4X03 Project grew into a big production we now call the Health Sciences Musical (HSM), a space where students are able to explore their passion for music, theater, and the arts. Since its inception, the musical has evolved into a tight-knit community encompassing almost 70 students as members of the following teams, executive, cast, chorus, band, choreography, musical arrangement, stage/props crew, promotional, and writing. These students come together to put on a 3-hour-long production every spring, with script-writing occurring in the summer, and cast, chorus, and band rehearsing weekly over a period of 5 months. The stage and props crew put in enormous efforts behind the scenes, and the executive team worked countless hours to plan and fundraise for the show through events throughout the year, such as Cabaret Night. Through this artistic pursuit, HSM has also enabled students to give back to the community. The proceeds from ticket sales go toward the BHSc Scholarship, as well as a local charity called Culture for Kids in the Arts, which is dedicated to providing access to quality arts programming for children and youth in the greater Hamilton region. This year, HSM students had a chance to meet with the founder of Culture for Kids in the Arts to better understand the cause and the impact of HSM’s donations. To celebrate the inaugural class of Integrated Biomedical Engineering & Health Sciences (IBioMed) and the first-year inquiry theme, the future of technology, HSM’s 11th annual production, titled HSM: I, Health Sci, features the fictional story of how a BHSc student builds a robot to replace her. We are always excited to welcome students, staff, friends, alumni, parents, and members of the McMaster and Hamilton community to join us in indulging in a wonderful story!