



Spotlight on the Future

We are delighted to present the 11th edition of the endMS National Training Program's *Spotlight on the Future* Newsletter. Within the pages of this year's newsletter, you will find the profiles of our 11th graduating group of SPRINTers and their mentors, a welcome message from next year's Summer School hosts, updates from our alumni, and some results from a recently completed alumni survey.

- continued on the following page

Firstly, we wish to extend our heartfelt gratitude to the MS Research Group of the University of Ottawa Brain and Mind Research Institute (uOBMRI), and Drs. Lisa Walker and Mark Freedman for having co-hosted this year's endMS Summer School. Special thanks also go to our 2021-2022 SPRINT mentors, Drs. Jodie Gawryluk, V. Wee Yong, and Josef Buttigieg.

After being held remotely for two years in a row, this year's eagerly anticipated endMS Summer School was a very successful in-person event.

Held in Ottawa from June 13th through 16th, 2022, Summer School participants were treated to a variety of presentations that enhanced their knowledge of novel MS research and work related to **The Therapeutics of MS**.

endMS Summer School attendees consisted of 39 graduate students, post-doctoral and clinical fellows. During full days of intensive learning, they attended sessions on a wide variety of topics, including: clinical trials, biomarkers, cell therapies, exercise interventions, cognition, and rehabilitation. During a "Lived Experience Panel" session, participants had the opportunity to hear from individuals living with MS and care partners. Summer School participants were also kept busy attending lab tours, workshops, career development sessions and networking activities.

This year, nine new SPRINTers were welcomed to the program (please see page 10). On June 13th, the SPRINT teams met and participated in a welcome orientation session.

On June 14th, our graduating SPRINTers presented their thought provoking and innovative interdisciplinary team projects:

- 1) **The Potential Role of Paramyxoviridae as an Instigator of an Autoimmune Response in MS.**
- 2) **A Review of the Aging Brain in Individuals with MS.**
- 3) **Iron Drives Lesion Evolution in MS: Overcoming its Hazards.**

Very positive feedback was received about this year's Summer School. Aspects that were particularly appreciated by trainees, included the opportunity to meet and interact with people affected by MS, and the diversity of topics and research that were presented.

Summer School was judged to be an enriching and valuable experience for all who attended, thanks to the dedication, interest and enthusiasm of everyone involved. The logistical challenges inherent to the planning and implementation of an endMS Summer School are many, and the team's ability to keep all activities on track, helped contribute to its outstanding success.

We sincerely thank the committee members, faculty, presenters, facilitators, panel members, organizers, and volunteers as well as those affected by MS who generously gave of their time and shared their experiences.

Excited about the future of research, we are looking forward to continuing to learn and work together to expand the community of trainee researchers. The next major endMS event will be the 2023 endMS Summer School, to be held in Quebec City from June 19th through 22nd, 2023.

sprint

(Scholar Program for Researchers IN Training)

Additional information about the application process will be available in December. To read a message from next year's Summer School hosts, please see page 11.

It is with great pride that we bid both new and graduating SPRINTers continued success in their future endeavors. We are also pleased to learn that many former SPRINTers have continued to pursue MS research. In April of 2022, we surveyed our SPRINT alumni and 97% of respondents reported that the program helped them develop and/or move along their career path. 90% reported that the program increased their intention to pursue MS research over the longer term. 100% of past SPRINT mentors who responded to the survey, revealed that they would encourage trainees to participate in SPRINT. Lastly, 100% of our former mentors said they would encourage others to become SPRINT mentors. (To read more about some of our SPRINT alumni, please turn to page 14.)

In closing, we wish our current SPRINTers and mentors, a year of rewarding collaborations, enlightening research and prolific discovery. We look forward to seeing you in Quebec City in June 2023!

DR. CHRISTINA WOLFSON
DIRECTOR, NATIONAL TRAINING PROGRAM

ANIK SCHOENFELDT
MANAGER, NATIONAL TRAINING PROGRAM

THE 2021-2022 SPRINTERS AND MENTORS

OUR SPRINTERS:
Nima Alaeiikhchi
Charbel Baaklini
Alexandra Jackson

Annie Pu
Nataliya Tokarska
Isabelle Tottenham

Zitong (Tony) Wang
Sameera Zia
Bettina Zierfuss

AND OUR MENTORS:
Josef Buttigieg
Jodie Gawryluk
V. Wee Yong

2021-2022 Sprinters & Mentors

Nima Alaeiikhchi

■ Raised in Tehran, Iran, Nima Alaeiikhchi moved to Canada when he was 17 years old. "I moved to Canada to continue my education and have since fallen in love with this country. Now I am a Canadian citizen studying and researching in Vancouver, BC at the International Collaboration on Repair Discoveries (ICORD) which is a University of British Columbia UBC-affiliated research institute, located at the Vancouver General Hospital."



As such, Nima changed his career trajectory and began studying MS. He now confesses, "I am very pleased with the decision I have made."

Currently, Nima is looking at the effects of ketone bodies in improving the behavioural performance in mice models of MS. "I also look at the brain, spinal cord, and systemic changes to look at the mechanisms by which ketone bodies provide the benefits that I have observed."

Given both his interest in translational research, and his recently developed interest in running clinical trials, Nima's long-term goal is to obtain an MD degree after earning his PhD.

Regarding SPRINT, Nima says, "It has been an inspiring experience to work with others who share the same passion as me."

While on the topic of inspiration, Nima reveals his own supervisor, Dr. Wolfram Tetzlaff, has been influential in motivating him to study. "Dr. Tetzlaff is very open-minded and allows me to think as an independent scientist and explore my own ideas." Nima also cites Drs. Matt Ramer, Tim Murphy, Gerald Krystal and V. Wee Yong, as having been very "encouraging" and "engaging".

Hoping to contribute to the development of reparative treatments, Nima says, "I am looking at repair mechanisms, specifically remyelination. I would like to enhance the remyelination to prevent axonal degeneration and the ensuing

neurodegeneration. There are a lot of immune therapies available at the moment. However, reparative treatments are lacking. My hope is that by stopping neurodegeneration, the progression of MS stops, and ideally, we will have functional recovery, and at the very least we can halt the worsening of symptoms."

Throughout his undergraduate studies, Nima worked at various jobs, including, gardening, landscaping, construction work, and pizza delivery.

"When I was younger, I always wanted to be a scientist, but those other jobs taught me how to better interact with others — an essential skill, no matter what profession one chooses," he says.

Another one of Nima's wishes, is for more funding to be available for "all researchers who want to make a difference in the lives of humankind, no matter what field they are in." Thoughtfully he states, "Together we can build a better world!"

When taking a well-deserved break from helping to build that better world, Nima enjoys walking, swimming and hiking.

"I always loved finding new treatments and helping people."

■ Charbel Baaklini received his BSc in biology with Honors from the Lebanese American University in Lebanon where he was born. He moved to Canada three years ago, and now lives in Edmonton, Alberta, where he is pursuing his PhD in Neuroimmunology at the University of Alberta.

A proud member of the Neuroscience Graduate Student Association of the University of Alberta, Charbel's long-term ambition is to become a clinician scientist. Now working toward achieving that goal, he is investigating the functions of microglia and macrophages during remyelination. "Myelin debris clearance is thought to be an essential process for remyelination, hence having an in-depth understanding of this process is where I strive to make a difference," he says.

When asked if he'd ever considered changing fields of study, Charbel reiterates how intrigued he is by MS from a biological perspective, and confidently states, "Neuroimmunology is very fascinating as it merges two previously separate fields of study. So no, I never considered changing fields, and probably never will!"

Charbel's desire to pursue his research of MS is unwavering. "With the countless meetings I have attended, I've had the opportunity to meet people affected by MS, which gives me

a push to keep going and not give up despite the challenges researchers face on a day-to-day basis," he says. Charbel's hope is that "doing research will positively impact a large number of people."

For his current project, Charbel explains how he's had to master an array of challenging skills ranging from animal handling, to staining and imaging procedures. "These methods come with a lot of variability, which was a hurdle to overcome," he admits. Despite these difficulties, Charbel happily reveals that he was able to overcome these obstacles. "Thankfully, I can now troubleshoot problems on-the-go and plan various experiments months in advance."

In addition to being thankful for his newly acquired skills, Charbel also expresses gratitude for the inspiration of his current supervisor, Dr. Jason Plemler. Charbel says Dr. Plemler supports him "on all levels" — from conducting cutting-edge research, to providing him with the tools and advice he needs to achieve his goal of becoming a clinician scientist.

Learning how to conduct a systematic review was Charbel's main objective for joining SPRINT. Now, in retrospect he says his experience did more than help him achieve that goal. As a SPRINTer Charbel learned how to "sift through the literature in a systematic and comprehensive way." It also enabled him to learn more about the clinical aspects of MS. Aside from expanding his knowledge of MS, he says SPRINT enabled him to "develop interpersonal skills related to discussing science in a constructive way." When asked if he'd recommend the program to others, Charbel says he deems the additional skillset one acquires through SPRINT as being "arguably necessary for conducting rigorous science".

When asked if he believes a cure for MS is forthcoming, Charbel replies, "Since MS is so heterogeneous, there are already therapies that work for some people, improving their day-to-day, considerably. I believe that with the amount of research being done...more and more people with MS will benefit from upcoming therapies."

When not studying, Charbel enjoys binge-watching crime shows, and admits that he can easily watch an entire season in the span of one night. He also loves "to walk around town, visit new restaurants and try new cuisines." Lastly, Charbel says, "I also exercise on a daily basis, as keeping your body fit will keep your mind sharp!"

As a SPRINTer Charbel Plemler learned how to "sift through the literature in a systematic and comprehensive way." It also enabled him to learn more about the clinical aspects of MS.



"The interaction with many motivated young researchers was an inspiration."

Josef Buttigieg

■ Originally from Gozo, Malta, the Buttigieg family immigrated to Toronto, Canada, where Josef grew up. Now a neurophysiologist, Joseph Buttigieg currently lives north of Regina, Saskatchewan.



When asked why he initially chose to focus on MS, Josef explains, "For a number of reasons. Firstly, there is the interesting intersection between several systems in the body. Unlike many diseases, MS intersects the nervous system, immune system, circulation and the environment. However, the most pressing issue, for me, is its devastating impact on the quality of life of people living with MS."

Given that some of Josef's friends live with MS, he has witnessed their transitions from being healthy young individuals, to no longer being able to care for themselves completely.

Motivated to help find a cure, Josef is now working on a targeted treatment for MS. He says, "Immune modulatory treatments are broad based and affect a series of systems negatively. Our approach is to specifically target immune cells that cause disease, while leaving other immune cells alone. The approach that we are currently developing is colloquially known as the *Trojan Horse*." He continues, "We give immune cells a specialized treatment that directly targets only immune cells that are targeting the myelin in the central nervous system. In animal models, we have very promising results. We are currently developing a Biotech company called *Odysseus Therapeutics*, to get this drug to phase 1 clinical trials."

"Testing this in a mouse model of MS, we have had mice that went from almost complete paralysis to almost normal mobility. The MS plaques in their brains virtually disappeared." Josef explains that while the first treatment was a single dose, he is currently testing repeated doses to see if there is an improved response. "Thus far, we are observing that lower, repetitive dosages, are more effective in returning normal movement and reducing plaque severity."

When asked to elaborate on some of the challenges he's dealt with in his field of research, Josef says, "Mostly it is the ability to find funding to get projects moving." He is hopeful that a transition to the biotech field, will help expedite the development of his current therapy project. Josef's long-term goal is "to see if our therapy is indeed effective in humans. We would like to get this moving in the next 3 years or sooner."

Aside from his research, Josef runs and operates a farm. Interestingly, he admits, "The idea for the *Trojan Horse* actually came from when I was driving a tractor!"

Of his experience as a SPRINT mentor, Josef says, "The interaction with many motivated young researchers was an inspiration."

Josef says he has always wanted to be a researcher. Aside from working in the field of science, other jobs he's had have varied greatly, "everything from a baker in my parent's restaurant, to a bouncer at a bar."

When asked if he believes a cure for MS will be found in his lifetime, Josef, a self-professed optimist, replies, "Yes, I think so."

Aside from owning and operating his farm north of Regina, Josef is active in sports including rugby and hockey.

Jodie Gawryluk

Originally from Manitoba, SPRINT Mentor, Jodie Gawryluk earned her PhD in clinical psychology from Dalhousie University. She currently lives in Victoria, BC, where she is an associate professor in the Department of Psychology at University of Victoria and a registered clinical psychologist.

Jodie first became interested in studying MS when she was a graduate student. "MS is a condition that can have a variable presentation for different people and over time." Excitedly, she adds, "The human brain is interesting and complicated and there is so much to learn. I am also motivated by the opportunity to help improve clinical outcomes through research."

Some of Jodie's research has involved investigating exercise as an intervention for MS, examining improved diagnostics and treatment monitoring for MS. She is now working on a project that examines how wearable sensor data correlates with magnetic resonance imaging metrics — with the aim of improving diagnosis and biomarkers for those living with MS.

Since it provides high resolution pictures of the brain, the use of magnetic resonance imaging is integral to Jodie's research. Unfortunately, "This type of research requires in-person data collection, which was put on hold during

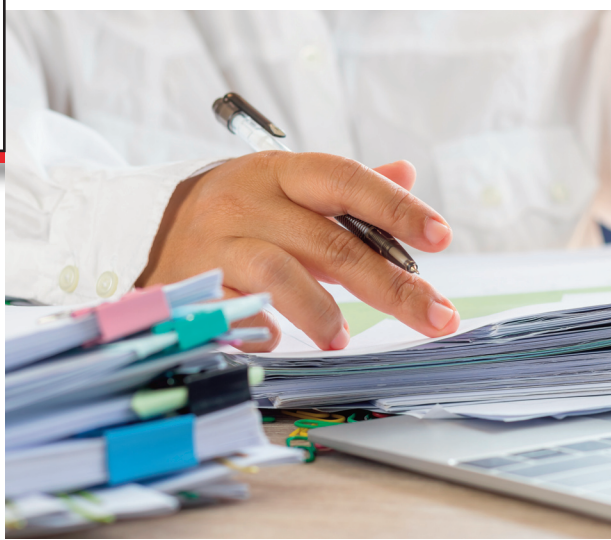


the height of the pandemic. This was definitely challenging, but our priority is always to make sure that participants are safe and that we are taking the precautions needed to keep everyone healthy!"

Of her experience as a SPRINT mentor, Jodie says she was inspired by the fantastic students she was honoured to have had the opportunity to work with. Jodie says, "Together, we learned a lot about how aging impacts people with MS. I also enjoyed learning about their primary areas of research. It was rewarding to see how the team worked together and supported each other in their learning and goals for the project. I enjoyed working with the trainees so much and I hope that our team will stay in touch. I also enjoyed meeting with the other mentors and leaders within the SPRINT program."

Throughout her own career, Jodie says she's been fortunate enough to have had several mentors who have encouraged her

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"I am allowing my grandmother's legacy to live on through me, by contributing to ending MS."

with MS, provider, and funding policy) to compare and contrast their use and acquisition of assistive devices for further analysis."

Regarding her SPRINT experience, Alexandra says she appreciated collaborating with other MS researchers across the country, networking with faculty and students, and learning more about MS research across disciplines. Additionally, Alexandra confesses that she was excited to learn how to create images using BioRender.

When asked if she believes a cure for MS is on the horizon, Alexandra says, "I think that we are the closest we have ever been to managing the symptoms and pathophysiology of MS with a range of pharmaceuticals, rehabilitation techniques, and assistive devices. I hope that we will find a cure sooner rather than later..."

When not working and striving to improve the lives of people with MS, Alexandra spends as much time as possible outdoors. She says, "Being by the lake clears my mind. In general, I just really enjoy being in nature. Going for a hike is another great way for me to re-energize." Apart from her outdoor adventures, Alexandra reveals, "I recently picked up the hobby of finger crochet and have been making blankets for friends and family."

Alexandra Jackson



Born in Mississauga, Ontario, Alexandra Jackson earned her BSc in kinesiology with a diploma in fitness & health promotion from the University of Guelph-Humber in Toronto. She later obtained her MSc in rehabilitation science and health & aging from Western University in London, Ontario. Currently, Alexandra lives in Angus, Ontario where she is pursuing her PhD remotely, from Queen's University.

Alexandra attributes her current trajectory in MS research to the inspiration of both her grandmother — who lived with MS, and to her current doctoral supervisor, Dr. Marcia Finlayson.

As a dedicated volunteer for the MS Society throughout her childhood, Alexandra recalls having participated in read-a-thons, walk-a-thons, and having sold carnations.

Later on, when she began her doctoral studies at the University of Toronto with a focus on spinal cord injury research, Alexandra says she, "had an epiphany and thought, *what am I doing?* I knew I wasn't as passionate about spinal cord injuries as I was about MS."

Reflecting upon her decision to change fields of study, Alexandra now confidently affirms, "I know this is where I am meant to be! I am so glad I made the switch."

Bearing witness to her grandmother's experience with MS also had a dramatic influence on Alexandra's desire to become a leader in MS research. "I witnessed the critical role of the environment on her health and well-being, and now strive to generate knowledge that will enable other people with MS to live in environments that meet their personal needs and reduce the challenges of their disabilities," she says. "I am allowing my grandmother's legacy to live on through me, by contributing to ending MS."

With her current doctoral research, Alexandra hopes to "shed light on potential complications and gaps in the using and acquiring of devices for those with MS." To that end, Alexandra is currently engaged in a three-phased research study. She is now collecting data for phase one. Elaborating, she explains, "In this phase, I ask participants about their experiences of using the assistive devices and how they acquired them (provider and funding). Phase two will consist of meeting with the providers (potentially physiotherapists, neurologists, or drug store customer service representatives) to understand their experiences of recommending or prescribing these assistive devices. Lastly, phase three will include a policy analysis of the aforementioned funding programs and insurance policies used by the participants with MS from phase one. This will allow me to write case studies based on these three perspectives (persons

Annie Pu



When Annie Pu was six years old, she and her family left Tianjin, China, and moved to Alberta, Canada. Years later, Annie completed her BSc degree on the other side of the country, at the University of Toronto's St. George campus, where she double majored in neuroscience and immunology. She later completed her MSc in neuroscience at the University of Calgary.

Currently a PhD candidate in the lab of Dr. Jennifer Gommerman at the University of Toronto, Annie is now studying the gut-brain axis, and the complications that aging introduces within the context of multiple sclerosis.

Annie admits that her interest in MS really began once she started working in Dr. V. Wee Yong's lab at the University of Calgary. There, she discovered the importance of MS, "not only in the way that it exemplifies brain-immune system communication and dysfunction," but also, she says, in the ways it "affects so many Canadians."

During the recent endMS Summer School, after hearing a panel of caretakers speak about their experiences, Annie says, "This was a perspective that I have never had the opportunity to hear about, and it was both heartbreaking and inspiring to learn about the sacrifices that have to be made by these caretakers, as well as the hope they have for MS researchers to make breakthroughs in treatment."

Hoping to contribute to those breakthroughs, Annie is currently exploring the connection between aging and the gut microbiome — and how they negatively impact the brain and cause neuroinflammation. Annie is interested in why some people "switch from relapsing-remitting MS, to progressive MS".

She explains, "We understand that MS progression can be correlated with age. Therefore, I am aiming to find out whether these shifts in gut microbiome that accompany aging can make neuroinflammation worse."

Annie reveals that her family has always been supportive of her choice to pursue research. "This is a path that involves extensive amounts of schooling, but my parents have always supported my decision to pursue my degrees without question." She adds that her supervisor Dr. Gommerman, has been an "incredible role model. She fully understands the hurdles that many women face in the course of pursuing this career path. She brings that understanding into her mentorship, and this makes me optimistic about the future for women in science."

Annie admits that a major challenge for her involves how slow research can be. "It sometimes feels as though there is no progress being made, seeing one experiment fail after another," she says, adding, "Knowing what our research means to people with MS puts everything into perspective, and is a reminder that this work is important,

"Although treatments are constantly improving, the fact that we still do not understand what can cause it, or why relapsing-remitting MS shifts into progressive MS is what continues to motivate me."

however incremental a discovery might be. Although treatments are constantly improving, the fact that we still do not understand what can cause it, or why relapsing-remitting MS shifts into progressive MS, is what continues to motivate me."

As part of SPRINT, Annie learned how to perform a systematic literature search and screening. She says she also really appreciated "the opportunity to befriend peers from different institutions" and to have been able to work cooperatively on a project that none of them were previously familiar with.

Annie's ultimate goal is "to become a staff scientist for drug development at a company such as Novartis or Pfizer."

When not working toward that goal, Annie says she enjoys puzzles. "There are lots of options available on my phone, and playing these games helps me take my mind off of the science temporarily and really helps me de-stress."

Nataliya Tokarska



Born in Ukraine, Nataliya Tokarska's family immigrated to Ontario when she was four years old. She now lives in Saskatoon, Saskatchewan — a province where the prevalence and large presence of MS have contributed to Nataliya's interest in pursuing neuroscience with a focus on MS.

Nataliya received her BSc in physiology and pharmacology with a minor in psychology, and her MSc in anatomy and cell biology from the University of Saskatchewan where she is currently pursuing her PhD in anatomy, physiology and pharmacology.

Nataliya says she always wanted to work in neuroscience. "Once I became a part of the MS research community, I realized how important this work is, and this further inspired me to remain in the MS field."

Her current project focuses on a novel, non-invasive therapy called acute intermittent hypoxia (AIH) which shows tremendous potential for repair within the demyelinated central nervous system. According to Nataliya, this novel therapy may have the potential to improve quality of life for those with MS.

"Until I started working within MS, I really did not understand the impact MS had on someone's life or their family and/or friend's lives as I did not have a personal connection to MS

when I began. Going to conferences where I had the chance to listen to stories from people with MS and their family and/or friends or actually meet them one-on-one, was eye opening. Seeing how MS affects so many aspects of their lives, not just in a physical sense, is a major reason for my choice to stay within MS research."

Prior to embarking on her current career, Nataliya's first job was in a grocery store. She details how the experience helped improve her communication skills. "I was never a big public speaker," she admits, amending her words, "Correction. I was terrified of it for most of my life, and I think my first job was key to me realizing that I actually liked working and talking with people." These days, her graduate studies involve a lot of public speaking, and she has even "started to enjoy it." Now, Nataliya is "even considering teaching/lecturing as a future career path."

For Nataliya, SPRINT provided the opportunity for her to conduct a full systematic review, something she hadn't previously done. "Being involved with one was a really great way to learn and gain the skills needed to do them in the future. I also learned a lot about MRIs and how they are used for MS diagnosis/research as this was a major focus of our review and the area of expertise of our mentor," she says. "Being a part of SPRINT has allowed me to widen my knowledge base greatly and inspired me to continue networking and creating connections with other students and researchers."

When asked if she is hopeful that a cure for MS is forthcoming, Nataliya replies, "Going to conferences and seeing all the brilliant scientists working on MS research makes me optimistic that a cure for MS is possible within my lifetime."

Nataliya believes it is important to have outlets outside of science. When not researching, she enjoys being outdoors, camping and travelling, skiing and snowboarding. She also likes to spend time with friends and family, and says the large Ukrainian community in Saskatoon plays a big role in her life.

"I also like cooking and baking, especially birthday cakes for friends and family. I love music and spend quite a bit of time working on music projects with my brother and sister. You can find us doing everything from producing original music to performing at festivals and events!"

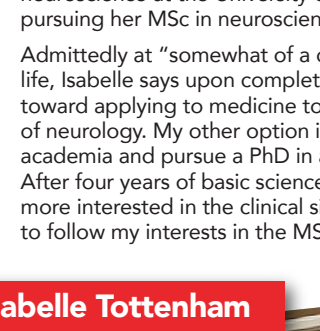
"Until I started working within MS, I really did not understand the impact MS had on someone's life or their family and/or friend's lives."



"Sometimes seeing the big picture and the idea of moving/change can be hard to grasp, but this program has really shown me that there are a lot of possibilities out there!"

When not working or researching, Isabelle says, "Any type of exercise really helps with keeping my head clear daily. I am lucky to live close to the Rockies so I like to hike whenever I can! I also have two dogs so all of my spare time is dedicated to them."

Isabelle Tottenham



Isabelle Tottenham completed her BSc (with Honours) in neuroscience at the University of Calgary where she is now pursuing her MSc in neuroscience.

Admittedly at "somewhat of a crossroads" at this point in her life, Isabelle says upon completion of her MSc, she is "leaning toward applying to medicine to hopefully end up in the field of neurology. My other option is to continue in the field of academia and pursue a PhD in a clinical-based research program. After four years of basic science training, I have now become more interested in the clinical side of the field. However, I hope to follow my interests in the MS field, wherever they take me."

When Isabelle initially chose to study neuroscience, it was mainly due to her interest in neuropathology and disease — stemming from the fact that many of her family members have lived with different neurodegenerative diseases including, Amyotrophic Lateral Sclerosis (ALS).

After hearing a lecture about MS and pain in one of her basic neuroscience courses, Isabelle's interest in MS was peaked. She says meeting people with MS, and hearing about their challenges, resonated very deeply with her, especially given her family's health history.

Currently, Isabelle is exploring non-invasive therapies for white matter injury. "Specifically, I am looking at an intervention called remote ischemic preconditioning and how it may affect remyelination." Ultimately, she says, "In my future research, I hope to focus on quality-of-life improvements."

Originally from Vancouver Island, in British Columbia, but now living in Alberta, Isabella says she feels "a very strong sense of community within the Alberta MS Network. I believe I am very lucky to live in a province where the MS scientific community are all closely connected and open to collaboration and networking."

According to Isabelle, an important challenge within her field, stems from communication — or rather, a lack thereof. "Specifically, between researchers, clinicians, pharmaceutical companies and, most importantly, people living with MS and their caregivers. In my opinion, hearing and addressing the needs of people living with MS outweighs everything else. There are many ideas that clinicians and researchers agree on (i.e., the need for change on a certain topic, for more open publication, etc.) but the discussion for consensus is harder than expected to initiate and complete."

When discussing her experience with SPRINT, Isabelle says she appreciated having the opportunity to network, and to explore a different area of MS research. She also learned more about extensive systematic review methodology and how to use the program Covidence. She adds, "In the grand scheme of things, it's inspiring to see so many different scientists, with different interests and backgrounds, all working in relatively independent fields yet still sharing the same underlying passion. Sometimes seeing the big picture and the idea of moving/change can be hard to grasp, but this program has really showed me that there are a lot of possibilities out there!"

Isabelle cites Drs. Bradley Kerr and Timo Friedman, as being key mentors who encouraged her in her initial pursuit of research. She adds, "they allowed me the opportunity to grow as a woman in science." Dr. Carlos Camara-Lemarroy who introduced Isabelle to the clinical field, has also been an important mentor.

Zitong (Tony) Wang



Originally from Beijing, China, Zitong (Tony) Wang received his BSc in biotechnology from the Beijing Institute of Technology before earning his MSc in health science from the College of Medicine, at the University of Saskatchewan. He is currently a PhD candidate in the Department of Psychiatry at the University of Alberta.

During his undergraduate studies in Beijing, Zitong says he "threw himself into teaching" during his spare time. "LightHouse Planning is an institute that collaborates with different high schools in Beijing to provide specific career planning as well as teaching assistants (TAs) to high school students." During his 5-year long stint as a TA, Zitong dealt with subjects including mathematics, chemistry, and physics. He says he "enjoyed every minute," of that period, and treasures the time he spent with his students. Zitong believes his experience as a TA equipped him with "the ability to build good relationships with different people of various characters."

Zitong's initial course of study was largely inspired by his grandmother's diagnosis with Alzheimer's disease when Zitong was a child. He reveals that he was particularly affected by the times when his grandmother could not recall his name. Witnessing his grandmother's gradual cognitive decline left a profound and lasting impression on him and consequently, Zitong began researching cognitive impairment and Alzheimer's disease.

Later on, when he was studying at the University of Saskatchewan, Zitong's supervisor, psychiatrist Dr. Yanbo Zhang, introduced him to the field of multiple sclerosis and to the high prevalence of cognitive impairment in those with MS.

Intrigued by the complex and diverse symptoms of MS, Zitong was compelled to expand his "understanding of the pathology of MS," and decided to investigate the "therapeutic potentials for novel treatment methods." Consequently, Zitong considers Dr. Zhang to have been an influential mentor.

In 2018, Zitong embarked upon his first project with the cuprizone mouse model, investigating the therapeutic potential of Low Field Magnetic Stimulation (LFMS). LFMS is a novel non-invasive brain stimulation that promotes myelin repair. Currently, Zitong's research not only focuses on the underlying mechanism of LFMS in treating demyelinating diseases with an animal model, but he is also investigating the beneficial effect and mechanism of ketamine on oligodendrocyte differentiation and maturation, with cell culture. Additionally, Zitong is researching the mechanism of psychotropic drugs on the treatment of post-traumatic stress disorder (PTSD), also with an animal model.

Of his participation in SPRINT, Zitong says he was honoured to have attended the various lectures, and to have met and collaborated with his teammates in both Banff and Ottawa. Zitong says he is grateful for the attentive support and personalized tutoring he and his fellow teammates received from Dr. V. Wee Yong.

Zitong reveals that after the 2022 endMS Summer school, he was inspired to pursue an exciting laboratory collaboration.

He adds that he feels fortunate to have also received additional guidance from Dr. Rashmi Kothary from the University of Ottawa and from Dr. Timothy Kennedy of McGill.

Zitong reveals that after the 2022 endMS Summer School in Ottawa, he was inspired to pursue an exciting laboratory collaboration.

When not researching, Zitong enjoys dining — an activity he particularly enjoyed with friends and family back home in Beijing. He emphatically states that no matter where he happens to be, his favorite food consists of noodles, "no matter which kind!" Zitong also admits to having a fondness for red wine, "particularly those produced in Napa Valley." Apart from Zitong's appreciation for all things culinary, he is a self-proclaimed "aficionado of aquatic organisms," and one of his favorite hobbies is to visit the aquarium of each city he travels to.



Wee Yong

Originally from Malaysia, Wee Yong received his BSc from the University of Manchester, in England and his PhD at the University of British Columbia. He is currently a professor at the University of Calgary, and Director of the Alberta MS Network.

The former Canada Research Chair in Neuroimmunology (Tier 1, 2004 – 2018) and President of the International Society of Neuroimmunology (2014-2016), first became interested in MS research during his postdoctoral fellowship.

While working with Dr. Seung Kim, a glial cell biologist at the University of British Columbia, Wee recalls, "I learned how to culture oligodendrocytes from autopsy human brain and this introduced me to studies in MS where this cell type is destroyed."

Currently working on numerous MS related projects, Wee reveals that he is seeking to reduce the overactive immune subsets that injure the brain cells of individuals with MS. He explains, "We are seeking to mobilize a useful aspect of immune cells, to help repair injury. In this manner, we are trying to balance the role of the immune system and sway it toward one of benefit and repair, rather than injury."



Reflecting upon his chosen field, Wee says, "Much progress has taken place in MS over the past 20 years. There are now many strategies to control the detrimental impact of certain activated immune cell populations that are problematic in MS."

According to Wee, "The next frontier is before us," that being, "how to elicit recovery in those living with MS." He adds that there are now a wide range of MS related projects in the works, including some that zero in on specific factors such as exercise — which may promote brain health. "We have coined the word *MedXercise* to highlight the combination of medications and exercise in helping to elicit brain repair," he says.

Wee hopes his involvement and contributions to some of these exciting projects will help "make a difference and also steer the field in the right direction for some time to come."

When discussing his experience as a SPRINT mentor, Wee says, he was humbled by the commitment of his three SPRINT mentees. He appreciated their enthusiasm in coming together "from very different perspectives and training backgrounds, to tackle a problem. I certainly would recommend SPRINT to others as it takes one out of one's comfort zone and one has to arrive at solving a problem from collaborating with a diverse group of people with very different background and skills."

Of this years' SPRINTers, Wee says "I have watched them mature from their isolated view point to collaborating in a team to try to impact MS."

When asked if he had any advice for future SPRINTers, Wee offered the following, "My advice would be to enjoy the experience and that despite the hard work, the product at the end is highly satisfactory."

When taking a break from working on his many projects, Wee likes to play doubles squash. "There are four players on the court, playing with a hard fast ball and while there is always the slim possibility of being hit, the running around and chasing the ball is a lot of fun." Although Wee admits that he isn't quite as proficient as he'd like to be, he always leaves the court with a smile on his face.

According to Wee, "The next frontier is before us," that being, "how to elicit recovery in those living with MS."

Sameera Zia



Sameera Zia received her BSc in neuroscience and human biology from the University of Toronto. Born in India, she currently resides in Edmonton and is pursuing her PhD research in neuroscience from the University of Alberta.

Interested in both neuroscience and immunology, Sameera explains how MS is at the intersection of both. "There is lots to uncover with respect to both and I am excited to contribute to our understanding of MS."

Also intrigued by the fact that MS has no known etiology, Sameera is currently working on gaining a better understanding of the role of microglia — the primary immune cells of the central nervous system — in the resolution of neurodegenerative lesions, such as those found in MS.

Given that potential reparative avenues remain to be explored, Sameera says, "I am using bioinformatics to dissect the diversity

of microglia in a regenerative environment with the hopes of promoting regeneration through microglia in people living with MS."

By focussing on regeneration of myelin — the fatty sheath surrounding neurons — following neurodegenerative lesions, Sameera hopes to identify regenerative factors and cell subpopulations that may be leveraged to improve the quality of life of those living with MS.

For Sameera, SPRINT was a wholly positive experience, especially with regard to her future aspirations. "SPRINT has expanded my network in the field of MS research and conversations with others in the field at large have helped immensely in propelling my own career forward," she says.

Her supervisor, Dr. Jason Plemel has also been "incredibly supportive" of Sameera's graduate career and has offered her invaluable advice on her next steps to becoming a clinician scientist. "I am very fortunate to have such a wonderful mentor."

Throughout her undergraduate degree, Sameera worked for a general practitioner creating html-based hospital referral forms. "This introduced me to efficient ways of handling large data

and sparked an interest in using high-dimensional techniques to analyze big data, which would eventually be the majority of my PhD project — bioinformatics."

Bioinformatics is a rapidly evolving field, especially with regard to microglia biology. Further to which, Sameera explains, "It is difficult for the field to come to a consensus on many issues so being on top of the ever-developing changes is quite critical."

Prior to her SPRINT experience, Sameera admits she had not given much thought to viruses, but her SPRINT group project helped broaden her understanding of their influence with regard to MS. Additionally, Sameera says, "Actively reviewing papers to prepare a succinct presentation has improved my literature review, critical thinking, and collaboration skills. I think the combination of instruction, hands-on experience and networking is invaluable."

When asked if she believes a cure for MS is forthcoming, Sameera says, "I hope a cure is found in my lifetime. I am certain, however, that the boundaries of our knowledge will be pushed in my lifetime and this will hopefully lead to a cure in the not-so-distant future."

When taking breaks from pursuing her goal of being a clinician scientist, Sameera enjoys biking in the city, and occasionally going to an archery range. She adds, "I like sitting down with a hot latte (with whipped cream) and a nice book or a puzzle! I find that to be quite relaxing."

"I think the combination of instruction, hands-on experience and networking is invaluable."



Hailing from Scheibbs, Austria, Bettina Zierfuss earned her BSc in biology, microbiology and genetics, and her MSc in molecular microbiology, microbial ecology and immunobiology from the University of Vienna in Austria. She completed her PhD in cell communication in health and disease, at the Medical University of Vienna, Austria.

Currently, Bettina lives in Montreal, where she is conducting research at the Centre de recherche du centre hospitalier de l'Université de Montréal. (CRCHUM)

Bettina Zierfuss



Bettina is particularly interested in "how immune cells can reach the deep brain tissue where they contribute to pathology." Intrigued by neuroinflammatory diseases, she hopes her research will aid in the discovery of a new target molecule for future therapies for people with MS.

"Early in my career I was introduced to neuro-inflammatory diseases and became fascinated by the complexity of the interaction between immune cells and the central nervous system. During my master's and PhD studies, I focused on the rare neuroinflammatory disease X-linked adrenoleukodystrophy (X-ALD)."

For Bettina, meeting individuals living with X-ALD, proved very inspirational. As a consequence of those meeting, Bettina says she was compelled to further enhance her knowledge about neuroinflammatory diseases — and aimed to do so by pursuing research with a "high translational aspect" for her postdoctoral work.

"I currently work on a molecule that is linked to immune cell infiltration and disturbance of the blood-brain barrier in MS. A blocking antibody was recently developed, and a clinical trial to analyze its efficacy in cancer patients is currently ongoing." Given the possibility that this particular drug may become useful for those with MS in the near future, Bettina feels very encouraged by these translational aspects of her studies.

Bettina's experience with SPRINT began shortly after she left Austria. "For me it was a great opportunity to not only learn more about MS, but also to expand my research network in Canada." She adds "SPRINT encourages students to reach out to each other and to mentors. I think the mental support from fellow students and mentors helps us keep an overall positive attitude at times of high pressure." For Bettina, SPRINT also increased her drive to pursue MS research in the long term.

While her direct supervisors, Dr. Alexandre Prat from the Université de Montréal and Dr. Johannes Berger from the Medical University of Vienna are inspirational forces, Bettina says she was also "encouraged and inspired by Dr. Isabelle Weinhofer from the Medical University of Vienna and Dr. Wee Yong from the University of Calgary. I'm very thankful for their guidance." Bettina says each one's enthusiasm about research has motivated her desire to pursue a career in academia.

Outside of academia, Bettina's first job involved making pastries in a bakery during her summer break. Later on, after graduating from music school, she worked as a clerk in a large furniture store for four years. She believes that job helped enhance her organization, communication, and problem-solving skills. She admits that her time spent working in retail gave her the opportunity to contemplate her future career path.

"I was always interested in natural sciences so I'm very grateful that I found my passion in research."

Reiterating, she adds, "I'm very passionate about my research but I also have scientific interests outside my field... I think one of the most challenging aspects in our research field is to keep a healthy work-life balance."

Bettina maintains that balance by beginning her day "with a yoga/meditation routine, or by going for a run at the Mount Royal Park. I also like to play the guitar and I recently picked up acrylic painting."

"I was always interested in natural sciences so I'm very grateful that I found my passion in research."

2022-2023 endMS SPRINTers

Syamala Buragadda Memorial University of Newfoundland
Dr. Haritha Desu Université de Montréal
Adam Groh McGill University
Gracious Kasheke Dalhousie University
Colleen Lacey University of Victoria
Dr. Katherine Sawicka University of Toronto
Fiona Tea Université de Montréal
Karine Thai Université de Montréal
Emily Wuerch University of Calgary

2022-2023 endMS SPRINT Mentors

Dr. Afolasade Fakolade Queen's University
Dr. Timothy Kennedy McGill University
Dr. Jacqueline Quandt University of British Columbia

2022-2023 endMS Education and Training Committee Membership

Dr. Christina Wolfson (Chair) Director, endMS National Training Program
 McGill University
 Research Institute - McGill University Health Centre

Dr. Nathalie Arbour Co-Director, endMS National Training Program
 Université de Montréal

Dr. Marcia Finlayson Co-Director, endMS National Training Program
 Chair of the SPRINT Committee
 Queen's University
 SPRINT Alumni, University of British Columbia
 University of Saskatchewan

Jessica Allanach Queen's University
Dr. Charity Evans University of British Columbia
Dr. Nader Ghasemlou Chair of the endMS Peer Review Committee
Dr. Jacqueline Quandt Dalhousie University
Dr. George S. Robertson Manager, endMS National Training Program
 Research Institute - McGill University Health Centre

Anik Schoenfeldt

2022 endMS Summer School Collaborators

Dr. Mark S. Freedman
 2022 endMS Summer School Co-Host
 University of Ottawa

Dr. Lisa A. S. Walker
 2022 endMS Summer School Co-Host
 University of Ottawa

2023 endMS Summer School Collaborators

Dr. Manu Rangachari
 2023 endMS Summer School Co-Host
 Centre de recherche du CHU de Québec - Université Laval

Dr. Luc Vallières
 2023 endMS Summer School Co-Host
 Centre de recherche du CHU de Québec - Université Laval

Message from the 2023 endMS Summer School Hosts

Quebec City June 19-22

We are pleased to introduce you to the 2023 endMS Summer School, **Translating Basic MS Research into Clinical Practice**, to be held at Laval University, in beautiful and historic Quebec City from June 19th to June 22nd.

The focus of this year's school will be on the fundamental mechanisms of autoimmune demyelination and current perspectives in translating research findings to the clinic. Topics will include T and B cells, autoantibodies, neurodegeneration, myelin cells and microglia. Furthermore, attention will be paid to cutting-edge techniques, including: single-cell RNA sequencing and mass cytometry (which aid scientists in obtaining unparallelled images of gene and protein expression), as well as the new technology of lipid nanoparticles (which allows for the delivery of RNA molecules into both animals and humans, for scientific and therapeutic purposes).

We are planning an exciting program that will include a variety of speakers, plenary sessions, and small group workshops. Time will be devoted to career development sessions, for SPRINT teams to present their year-long interdisciplinary learning projects, for participants to interact with people living with MS and to network with peers in MS research from across Canada.

We look forward to seeing you at the 2023 endMS Summer School — an event that promises to be rewarding and memorable.



Luc Vallières

Manu Rangachari



Please have the Summer School continue until we end MS! It's so great that for sure I will be applying for it again next year!
- 2022 endMS Summer School participant

A great event to learn about MS research and a fantastic chance for networking and a motivation to continue MS research.
- 2022 endMS Summer School participant

It is my first time attending endMS Summer School as a SPRINTER. A fantastic platform to meet MS researchers and get to know their work in the field of MS: from cellular and molecular mechanisms to clinical trials and therapeutics of MS.
- 2022 endMS Summer School participant and SPRINTer

Networking is one of the most incredible benefits of endMS Summer School. I had an opportunity to meet pioneers in MS research which may impact my career path.
- 2022 endMS Summer School participant

endMS Summer School OTTAWA 2022

10 years of endMS SPRINT!

Hitting this milestone inspired us to conduct two surveys in April 2022. The first, a survey of our SPRINT alumni (2011-2021), was designed to gather information on the impact of the program on the career trajectories of SPRINT alumni. The second survey focussed on our SPRINT mentors.

SPRINTer Survey

The survey was emailed to 87 SPRINT alumni, out of which, only two could not be reached. Of the 85 surveys sent, 58 (68.2%) responses were received. The vast majority of respondents (90%) said they were currently active in MS research (62%) or had been active in MS research over the past 5 years (28%). More than two thirds (77.6%) reported that they are currently living in Canada and of those (22.4%) currently residing outside Canada, 38.4% were still in training. The majority (89.7%) of those who reported being currently active in MS research stated that the SPRINT program had increased their intent to continue in MS research. 97% indicated that the program helped them in their career trajectory (see figure 1).

Qualitative analyses (see figure 2) revealed that networking was the predominant benefit and the foundation of other advantages such as the development of communication skills, knowledge translation and new research methods. Some themes that emerged, involved the lasting impact of the program. Specifically, on the SPRINTers' sense of community, as well as on their capacity to move forward, thanks in part to the meaningful mentoring and support they received.

SPRINT Mentor Survey

This survey was sent to 29 mentors and 26 (89.6%) responded. Mentors were unanimous in stating that they would encourage others to become mentors — and would also encourage their trainees to participate in SPRINT (see figure 3).

The qualitative analyses of the open text revealed that mentors felt they had benefitted from the program in many ways, including through professional development which enabled them to gain supervisory experience, enhanced their publication profile, and allowed them to explore new areas of inquiry (see figure 2).

In summary, the main benefits of endMS SPRINT include; networking, skill development, and professional development. From these benefits stem career opportunities and progression, and the building of capacity and community among MS researchers across the country.

Figure 1

SPRINT ALUMNI 2011-2021

58/85 received

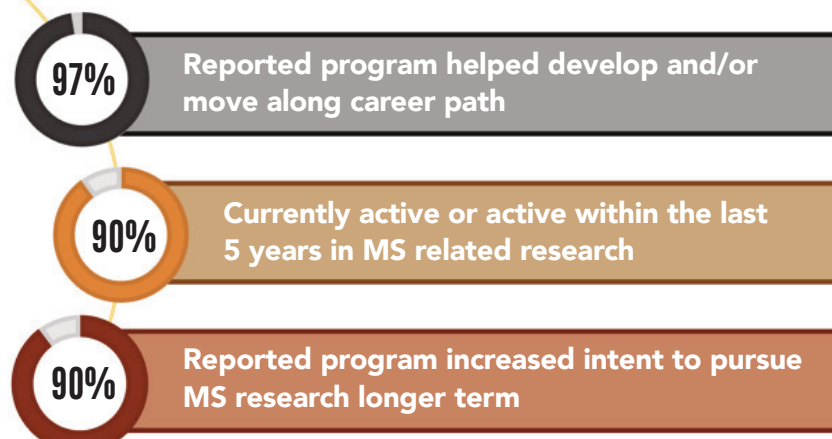


Figure 2

BENEFITS AND IMPACTS OF SPRINT BASED ON TEXT RESPONSES FROM ALUMNI AND MENTORS

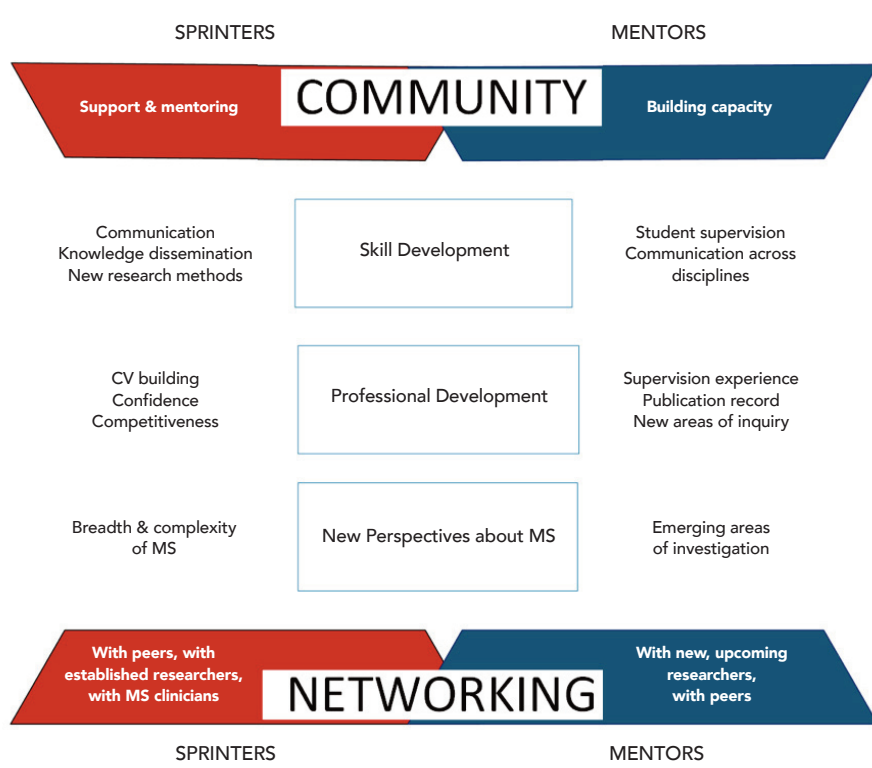
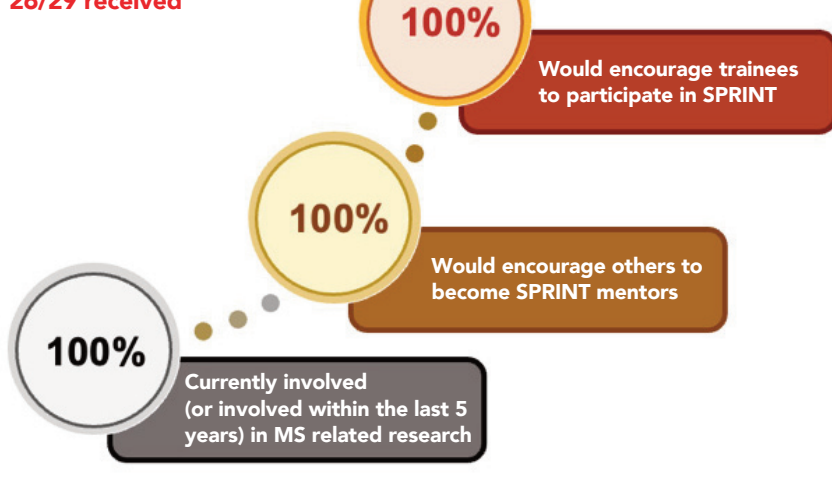


Figure 3

MENTORS 2011-2021

26/29 received



2022 Alumni Updates

Dr. Monique Almeida will be starting a new postdoctoral position in Dr. Rashmi Kothary's lab in Ottawa, beginning in November 2022.

Maria-Elizabeth Baeva successfully defended her Master's thesis at the University of British Columbia and is now in her second year of medical school at the University of Calgary. She continues to do research in MS. Having published a paper examining the effects of dimethyl fumarate on immune cells in people with MS, she is continuing clinical and benchtop research in the hopes of further understanding the neuroimmunology of MS. Her plan is to become a clinician scientist specializing in neuroimmunology.

Dr. Stephanie Blandford successfully defended her PhD in July 2022.

Dr. Marc Charabati was awarded a 2022-2023 MS Society of Canada postdoctoral fellowship, for his project titled, *Repurposing Miglustat to modulate astrocyte and microglia pathogenicity & treat progressive multiple sclerosis*.

Dr. Afolasade Fakolade is starting her third year as Assistant Professor in the School of Rehabilitation Therapy at Queen's University. Afolasade's research program focuses on supporting active and healthy living among people with disabilities, including individuals with MS, and their family caregivers. Over the next year, together with her collaborators, she will be developing and evaluating a digital toolkit to enhance resilience among caregivers of persons with MS. Afolasade is also contributing to the training of the next generation of MS researchers. She is excited to be a SPRINT mentor this year. She will be working

with SPRINT trainees on a scoping review to evaluate the extent to which usability principles are applied in digital health technologies targeting persons with MS and their families.

Dr. Marjan Gharagozloo was awarded a Career Transition Fellowship from the National Multiple Sclerosis Society and will work with Dr. Peter Calabresi at Johns Hopkins for the next 5 years. There, she will investigate the molecular pathways regulating glia-mediated inflammation and neurodegeneration in multiple sclerosis. Marjan is also a member of the endMS SPRINT committee.

Dr. H el ene Jamann completed her PhD in December 2021. She recently gave birth to her first son, L eonard. After successfully passing her 4th year of medical school, she plans to continue with her MD-PhD program at Strasbourg University in France.

Dr. Rajiv Jain is continuing his postdoctoral fellowship with Dr. V. Wee Yong at the University of Calgary. He is currently funded by an endMS postdoctoral fellowship. The focus of Rajiv's post-doctoral fellowship is to look at how B cells interact with central nervous system elements to promote MS pathology.

Emily Kamma is continuing her PhD in Dr. Jacqueline Quandt's lab at the University of British Columbia. She was awarded a 2022-2023 MS Society of Canada studentship. Her project focuses on characterizing the clinical and immunopathological alterations that may drive risk and disease progression in a new mouse model of progressive multiple sclerosis.

Dr. Kaarina Kowalec continues in her position as assistant professor at the University of Manitoba and Karolinska Institute (Sweden) and is working on understanding MS and its comorbidities using polygenic risk scores, using data from the UK biobank, the CIHR-IMID study, and the US-based CombiRx study.

Wendy Lasisi was awarded an MS Society of Canada doctoral studentship to study the role of sensorimotor integration in upper extremity dysfunction in MS.

Dr. Hyunwoo Lee is continuing his postdoctoral fellowship with Professor Robin Hsiung, at the University of British Columbia. His research focuses on neuroimaging of aging and dementia.

Dr. Cole Libner successfully defended his PhD at the University of Saskatchewan in July 2022, under the supervision of Dr. Michael Levin. Cole's PhD focused on understanding mechanisms of how autoantibodies may underlie neurodegeneration in MS. He is currently enrolled in the MD program at the University of Saskatchewan, where he hopes to gain the knowledge and skills necessary to pursue a career as a clinician-scientist.

Brian Lozinski was awarded an MS Society of Canada doctoral studentship to study *"Fibrosis of PDGFR + cells following spinal cord demyelination is exacerbated with age and may be therapeutically targeted"*.

Dr. Kedar Mate recently started an M.D., C.M program at McGill University.

Dr. Julia O'Mahoney is currently a postdoctoral fellow at the University of Manitoba under the direction of Dr. Ruth Ann Marrie.

Dr. Evelyn Peelen is working as Senior Manager Translational Pharmacology, at the clinical-stage biopharmaceutical company, Immunic AG, in Munich, Germany.

Dr. Julie Petrin is the new manager of impact and evaluation at the MS Society of Canada.

Dr. Huah Shin Ng completed her MS Society of Canada's postdoctoral fellowship at the University of British Columbia with Dr. Helen Tremlett, before returning to Australia in December 2021. She is currently a practitioner fellow at Flinders University, Adelaide, Australia. Her research focuses on the (pharmac)-epidemiology of chronic diseases.

Dr. Simon Thebault was awarded a 2022-2023 MS Society of Canada postdoctoral fellowship, project title: *Comparative study of immune reconstitution phenotypic and functional profiles following immune depleting therapies for multiple sclerosis*.

Dr. Bettina Zierfuss was awarded a 2022-2023 MS Society of Canada postdoctoral fellowship, project title: *Targeting mannose receptor C type 2 on encephalitogenic leukocytes in multiple sclerosis*.

www.msociety.ca/trainingprogram

For Summer School and/or SPRINT application and program guidelines, please visit our website at www.msociety.ca/trainingprogram. If you are interested in becoming a SPRINT mentor or would like more information on the program, please contact:

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The endMS National Training Program is a component of the endMS Research and Training Network aimed to enhance knowledge and skills relevant to MS research, foster opportunities to conduct MS research in Canada and increase intent amongst trainees to pursue MS research for the long term. The Training Program is led by Dr. Christina Wolfson and funded by a directed grant from the MS Society of Canada through the MS Scientific Research Foundation.



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