(Scholar Program for Researchers IN Training)

e are delighted to present the ninth edition of the endMS National Training Program's Spotlight on the Future Newsletter. Within these pages, you'll find profiles of our graduating SPRINTers and their mentors, as well as news about this year's unique 2020 Summer School. We are also pleased to introduce the hosts of the 2021 Summer School.

Although Dr. Robert Carruthers and the UBC MS Connect Program at the University of British Columbia in Vancouver were set to host the 2020 endMS Summer School from May 19 to May 22, 2020, unfortunately, due to the COVID 19 pandemic, the in-person event had to be cancelled. However, after much brainstorming and collaboration, the hosts of the 2020 endMS Summer School and the endMS National Training Program, decided to offer virtual "endMS Summer School Bits and Bytes" sessions to provide a taste of the Summer School experience for those who were accepted to participate in 2020.

A big thank you to Dr. Robert Carruthers, and Michelle Eisner, the 2020 endMS Summer School Coordinator, for all their efforts in making the Summer School Bits and Bytes sessions a success!

The SPRINT orientation session for the incoming 2020-2021 SPRINTers and the introductory SPRINT team meetings were held via Zoom on May 19th.

The inaugural virtual Summer School Bits and Bytes session was held on May 26th, and featured Dr. Virginia Devonshire, who spoke about COVID 19 and Multiple Sclerosis.

To showcase some of the originally planned Summer School material and cutting-edge research, 7 additional sessions were held throughout the summer months, and future sessions are being planned.

On June 2nd 2020, graduating 2019-2020 SPRINTers presented their year-long interdisciplinary team projects, via videoconference. The 3 thought provoking and innovative interdisciplinary learning projects included: 1) Current Status of Neuroprotective and Regenerative Strategies for Myelin Repair in Multiple Sclerosis, A Systematic Review. 2) Standardizing Outcome Measures of Disease Recovery in MS Animal and Human Drug Trials, and 3) Geographical Variations in Adherence to Disease Modifying Therapies for MS.

We are very grateful to our three outgoing mentors whose resourcefulness and ingenuity allowed SPRINTers to continue to be supported and guided, despite the pandemic. We are appreciative of the time each mentor took from their intense workloads, to foster our SPRINTers throughout the evolution of their trainee projects.

For a preview of next year's 2021 endMS Summer School, please see page 10.

Additional information about the application process will be made available later in 2020.

We are hopeful about the future and eager to continue learning and working with you. We remain enthusiastic about the growing community of trainee researchers who will become experts and leaders in the field of MS research and clinical practice.

We are very pleased to learn that many former SPRINTers have continued to pursue MS research. To find out more about our SPRINT alumni, please turn to page 11.

To our graduating SPRINTers, we wish you continued success in your future endeavors, and to our current SPRINTers and mentors, we wish you a year of rewarding collaborations, fruitful research and noteworthy discoveries. We look forward to connecting with you at the 2021 endMS Summer School in Saskatchewan, where our hosts will be Drs. Charity Evans, Michael Levin and Valerie Verge.

DR. CHRISTINA WOLFSON DIRECTOR, NATIONAL TRAINING PROGRAM

ANIK SCHOENFELDT

MANAGER, NATIONAL TRAINING PROGRAM

THE 2019-2020 **SPRINTERS** AND MENTORS

Our SPRINTers:

Jessica Allanach Arthur R. Chaves Dr. John Farrell Hélène Jamann Miceline Mésidor Nikki Ow **Camille Simard** Karin Rustad

and our mentors:

Dr. Charity Evans Dr. Soheila Karimi Dr. George S. Robertson



Jessica Allanach

essica Allanach received her bachelor's degree in biochemistry (BSc) from Mount Allison University, in Sackville, New Brunswick. She is currently a PhD candidate in microbiology and immunology at the University of British Columbia in Vancouver.

Originally from Moncton, New Brunswick, Jessica initially became interested in researching MS thanks to her first immunology course, taken during her undergraduate degree. According to Jessica, MS is particularly interesting to research because "it sits at the intersection of neurology,

immunology and genetics.

"I found interest specifically in how autoimmunity is initiated and the cellular and molecular mechanisms that act to produce disease.'

With an interest in the molecular biology and evolution of viruses and the effects of infection on the host, Jessica says, "Research in autoimmunity often highlighted the influence of viral infection in disease initiation and progression, which piqued my interest in researching the topic in graduate school." Given the high prevalence of MS in Canada, Jessica believes that a better understanding of its basic mechanisms is necessary, "in order to more effectively design treatments

for people living with MS." "The severe and tangible impact the condition has on the lives of so many people provides perspective to my curiosity-driven scientific

Under the supervision of Dr. Marc Horwitz, Jessica has been working toward constructing humanized mouse models of MS to assess the effects of Epstein-Barr Virus (EBV)

infection on the immune system in disease. "Studying the role of EBV in MS is challenging because it only infects humans and the lack of animal models that can be infected with EBV has further limited experimental investigation. By using humanized mouse models of MS that are susceptible to infection with EBV,

we are able to dissect and evaluate the role of the virus in autoimmune responses in a representative system of disease.

Jessica's long-term career goals are centered around producing basic scientific research that will have clinical relevance for understanding and treating autoimmune disease. She attributes her pursuit of a career in science to her undergraduate research supervisor, Dr. Amanda Cockshutt.

"Dr. Cockshutt was a consistent, knowledgeable and supportive mentor, all the while serving as the only female professor for our

discipline at the time of my studies. As a child, Jessica imagined having a career in ecological or veterinary sciences. In retrospect, she says, "It seems I haven't

veered too far from that path. Her first employment experience, however, was as a clerk and cashier in a clothing store. "That first retail job taught me patience in working with people who communicated differently. The experience has allowed me to practice that patience with scientific ideas, concepts and data that are challenging to process and integrate into my current understanding.

SPRINT appealed to Jessica as a means of increasing her exposure to new lines of inquiry in MS research.

"I was also interested in working on a project

with researchers of different backgrounds.' Reflecting upon her SPRINT group project, Current Status of Neuroprotective and Regenerative Strategies for Myelin Repair in Multiple Sclerosis: A Systematic Review, Jessica reveals that it broadened her knowledge and understanding of the biology of MS. "It has also been refreshing to engage in a new type of research in a different sub-field of MS that complements my own. Jessica adds that aside from allowing her to design and perform a systematic review for the first time, her SPRINT project also enabled her to collaborate with researchers

at institutions across the country. To unwind, Jessica spends time outdoors with her "adventurous" puppy. She also enjoys doing puzzles, going to yoga class and attending stand-up comedy shows.

"I have always been passionate about the benefits of exercise training and its different paradigms on the brain."



Arthur R. Chaves

riginally from Rio de Janeiro, Arthur R. Chaves completed his bachelor's degree in physical education kinesiology/human kinetics (BSc-Kin) at the Federal University of Rio de Janeiro, in Brazil, Arthur now lives in St. John's, Newfoundland where he is conducting research at Memorial University's Recovery and Performance Lab.

Currently writing his PhD thesis, Arthur reveals that he is "moving towards a postdoctoral position, in which I am planning to learn a new technique (Optogenetics) in order to better investigate and understand brain connections in the lesion-disrupted brain.' At the age of ten, Arthur began training in Taekwondo, eventually becoming a

competitive athlete and fighter. He developed probe brain excitability in MS. His research an interest in anatomy, rehabilitation and physical fitness, "from a scientific perspective," after suffering from an injury that, unfortunately, put an end to his athletic career.

Dealing with his own recovery led Arthur to pursue sports science and kinesiology. Arthur recalls that in his first year of studies,

he took special interest in the work of Dr. Jean Christophe Houzel, a neuroscience researcher, from whom he learned about "research in general, neuroscience, and exercise.

Arthur is grateful to his former Taekwondo trainers, (also referred to as "masters") for having imparted valuable lessons that remain applicable to his life today. "The lessons I subconsciously learned when

I was 10 years-old somehow prepared me for the academic life I live now.

A quote favored by his Taekwondo masters, "Be a fighter inside and outside of the rings," now serves Arthur as a reminder that much like athletes, researchers must also "be resilient, learn, and overcome challenges, all the time."

Intrigued by the complexity of MS, Arthur uses transcranial magnetic stimulation to

ocuses on demonstrating that improving fitness may help fight the disease, repair and

"I have always been passionate about the benefits of exercise training and its different paradigms on the brain."

improve quality of life.

The aim of Arthur's research is to understand the effects of exercise and fitness on the brain affected by MS, and to provide insight as to "whether people with MS should stand against MS and start exercising to improve brain health to better fight the disease.

Briefly outlining a few of the cross-sectional studies he published while working on his PhD. Arthur details how brain excitability asymmetry in MS predicted physical and cognitive symptoms. He explains that poor fitness was related to increased intra-cortical inhibition, which in turn related to greater fatigue in those with MS. Another one of his studies demonstrated that people with progressive MS can still undergo neuroplasticity. Arthur says that neuroplasticity was induced by one single session of exercise. whereas lower fitness levels may actually undermine neuroplasticity.

"This points to the importance of increasing fitness in MS to potentiate the effects of any neuroplasticity-inducing protocol."

Arthur also demonstrated that, "together with improvements in physical fitness, brain excitability was enhanced in progressive MS after three months of walking training."

Grateful to his current supervisor, Dr. Michelle

Ploughman for everything he has achieved thus far in his academic career, Arthur hopes to eventually, "become a research leader in MS in a major Canadian university."

As an international student, Arthur appreciated that SPRINT provided him with valuable networking opportunities. SPRINT "helped me get involved with the MS Society of Canada... understanding its dimensions, where the MS

field is and how and where it is moving. Although he doesn't foresee a cure for MS in the immediate future, Arthur maintains that "the field is moving faster...ultimately it is going to happen."

When not researching, Arthur enjoys exercising, playing music, and spending time with his friends and loved ones.



harity Evans received her bachelor's

degree in pharmacy (BSP) and her PhD in pharmacy from the University of Saskatchewan. Currently living in Saskatoon, Saskatchewan, Dr. Evans is an associate professor in the College of Pharmacy and

Director of the Saskatchewan Continuing Education Program for Pharmacy Professionals, Dr. Evans is also director of the provincial medication information service, medSask. Charity's first introduction to MS research

Shortly thereafter, upon her return to Saskatchewan, Charity's interest in MS

developed even further. "We have one of the highest rates of MS in Canada and there was relatively little clinical or epidemiological research happening

at the time. The unfortunately high rates of MS in

Saskatchewan has afforded Dr. Evans many opportunities to connect with individuals living with or affected by MS. "As a researcher, these connections often

provide the inspiration and motivation to keep going." While on the topic of motivation, Charity

reveals that one of her early work experiences was at a McDonald's, where she worked her way up to a managerial position. "I loved that job, and the experience and skills I gained during that time have served me well.

If you can manage a McDonald's restaurant during the Grey Cup in Saskatchewan, you can pretty much do anything!" Using administrative health data, Charity

pharmacoepidemiology of MS. She has been

focuses on the epidemiology and the

disease-modifying drugs on healthcare utilization, as well as the safety and effectiveness of those medications. Recently, Charity has expanded the scope of her research by becoming involved in studies that examine physical activity in MS, "including one randomized controlled trial that showed the benefit of Pilates exercises in mobility. A SPRINT mentor this year, Dr. Evans

acknowledges that her own mentors have been instrumental in the trajectory of her

career, most notably, Dr. Ruth Ann Marrie. Dr. Marrie "has always had time to answer my (endless) questions, provide guidance also cites Dr. Katherine Knox, one of

and advice, and support my efforts." Charity Saskatchewan's first MS researchers, as having "played a huge role" in her decision to commit to MS research.

As one of SPRINT's very first participants,

Dr. Evans still collaborates with people she met during her first endMS Summer School in Halifax, Nova Scotia back in 2010.

"I will never be able to say enough good

In her role as a SPRINT mentor, Dr. Evans

things about the endMS Training Program!"

Modifying Therapies for MS — a project Dr. Evans admits she'd likely not have had the opportunity to complete otherwise, if not for SPRINT. Charity's experience as a mentor reminded

Geographical Variations in Adherence to Disease

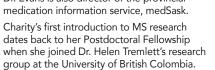
her of the importance of being able to explain one's research and area of study to those unfamiliar with the field.

"Often, we get so wrapped up in our own work that we lose the ability to communicate effectively with others...whether it's patients, the public, or other researchers.

When asked if she believes a cure for MS is forthcoming, Dr. Evans replies "if a cure is found for one autoimmune disease, the others will be close behind. I think we will continue to identify strategies, including non-drug options such as exercise, that will continue to improve quality of life, and maybe even repair.'

the lab remains busy. "I have two small children, and especially during this time of COVID, I have found that running (alone!) helps to clear my mind. Things seem less daunting or less stressful

When not researching, Charity's life outside





Dr. John Farrell

riginally from Oklahoma, John Farrell earned his bachelor's degree in exercise physiology (BSc) with a minor in biology from Midwestern State University in Wichita Falls, Texas. He then obtained both his master's degree (MSc) and PhD in exercise physiology from the University of Oklahoma in Norman, Oklahoma.

Now living in Ottawa, Ontario, John is completing the second year of his Postdoctoral Fellowship at the Clinical Exercise Physiology Laboratory at the University of Ottawa. Beginning this Fall, John will take up a position as assistant professor at Texas State University. Back when he was 15 years old, John worked for a family run carpentry business.

as well as helping with installs." While John is proud to have acquired these pragmatic skills, he recalls how physically difficult the job was.

"I helped build custom furniture and cabinets,

"We worked in part of an old warehouse that didn't have air conditioning, and this was a real issue because in Texas...temperatures easily hit 100 degrees Fahrenheit during the summer!" John admits, "it definitely taught me a lot about having a great work ethic, and paying

attention to small details." Passionate about exercise, John initially began studying exercise physiology by focusing on enhancing the athletic performances of high level athletes.

"My undergraduate advisor at Midwestern State University, Dr. Frank Wyatt, really inspired my love for exercise physiology and encouraged me to pursue a graduate degree.' John's interest later evolved into developing therapies that could be used to improve and/or maintain the quality of life for those living with MS.

Currently part of a research team, John briefly outlines some of the studies they are presently

"One of our largest projects has been examining the effects of functional electrical stimulation (FES) cycling exercise training program in persons with MS with severe disability." This six-month training program will examine physiological responses and potential improvements in functional outcomes. "Our team is also examining the potential of

an internet-delivered 6-month lifestyle physical activity intervention to improve cardiorespiratory fitness and vascular comorbidity risk in person with MS mild-to-moderate disability." Additionally, John and this research team are also testing the cognitive and physical

demands of performing a dual-task in older adults with and without MS. "Examining how different fitness parameters (e.g., lower limb strength and power) contribute to walking performance in older adults with MS, to better inform future

rehabilitation programs. Regarding the participants involved in those aforementioned studies, John says they have all shown "such a positive attitude and a willingness to participate in research — not necessarily for their benefit but for the benefit of others in the future."

advisor at the University of Oklahoma for having taught him how to "conduct research properly" and for having encouraged him to be an independent researcher. John's current postdoctoral supervisor, Dr. Lara Pilutti, has also been instrumental in helping him secure funding for his research.

John cites Dr. Rebecca Larson, his graduate

"Working with her has allowed me to expand my network of potential collaborators and enhanced my overall capabilities as a researcher."

According to John, working on his SPRINT group project, (Current Status of Neuroprotective and Regenerative Strategies for Myelin Repair in Multiple Sclerosis: A Systematic Review) allowed him to expand his knowledge to include areas he'd not previously had much experience with.

"Being able to read and understand quality research studies to a much greater extent that involve animal models and basic science techniques was a huge skill that I gained.' When not researching, John enjoys spending time with his wife and dog.

"We love to go on long walks and hikes together or just spend a quiet day at home."



Hélène Jamann

élène Jamann obtained both her bachelor's degree in medicine (BMed), and her master's degree in neuroscience (MNeuroSci) from the University of Strasbourg

Raised in Sarreguemines, a town in Moselle, France, Hélène now lives in Montreal, Quebec where she works in the laboratory of Dr. Catherine Larochelle, at the Université de Montréal.

Currently, Hélène is examining, "the interaction between oligodendrocytes, (brain cells indispensable for neuron's health and survival), and the pathogenic immune cells that enter the brain, in the context of MS.

When asked why she chose to focus her studies on MS, Hélène explains, "MS interests me particularly because it touches relatively young people.

Hélène's interest in neurology and neuroscience, developed at a very young age courtesy of a family member's affliction with a neurological disorder. She reveals that being faced with her brother's Attention Deficit-Hyperactivity Disorder, inspired her to want to contribute to finding a medical solution

that would help alleviate his suffering. The entire Jamann family encouraged Hélène's aspirations. "Of course, my family and my parents support me wherever I go! Since primary school, I knew I wanted to be in the medical field."

By the age of 15, Hélène was "already involved in helping others."

Her first paid job was as a "surveillante de baignade" — a summer camp counselor job for which she was required to obtain a lifeguard's license.

Hélène says her first aid skills also enabled most notably as a first-aid volunteer and as

Hélène believes those early work and volunteer experiences enriched both her ability and desire to work with people. "It is clearly thanks to them that I love working in teams now."

"SPRINT was a great opportunity to work with people from other fields and to conduct a project in a team. I learned a lot from them and my mentor.'

experience gave her, "the taste for systematic Hopeful that a cure for MS will be found in

Hélène even admits that her SPRINT

her lifetime, Hélène is now contributing to the cause by working on the disease's mechanisms. Her long-term goal is to become a clinician-researcher. Given the vast scope of neuroimmunology,

Hélène says her biggest challenge is the frustration that mainly stems from her insatiable curiosity. When asked about specific challenges she faces within her field, Hélène muses, "Not being able to work on everything else, of course!"

Hélène attributes this to several factors. including the effectiveness of communication between scientists and clinicians, the availability of human tissue and also to the prevalence of patient involvement.

"I am really lucky to work in an interdisciplinary and collaborative environment. Hélène openly admits that having "very helpful colleagues" including a readily accessible supervisor, afforded her the opportunity to acquire new knowledge — which in turn helped attenuate her frustrations. According to Hélène, SPRINT permitted her

to step out of her "comfort zone" and also gave her some valuable skills that she'll need as a clinician. Hélène admits that it was, "a great experience to learn something new."

"I learned how to do a systematic review, how persistence/adherence is studied, and I know how to create a map with (the computer language/code) R now!" When not working in the lab, she enjoys going hiking and camping — always ensuring that she has plenty of good books





Dr. Soheila Karimi

ը oheila Karimi currently lives in Winnipeg, Manitoba where she is a professor in the Department of Physiology & Pathophysiology and senior scientist in the Regenerative Medicine Program at the University of Manitoba. Dr. Karimi is also principal investigator at the Spinal Cord Research Centre at the Rady Faculty of Health Sciences in the Max Rady College of Medicine at the University of Manitoba. After completing her undergraduate degree in animal biology and her master's degree (MSc) in anatomy in Iran, Soheila moved to Canada to attend the University of Saskatchewan, where she obtained her PhD

in neurosciences. Soheila then relocated to

Toronto to join the Toronto Western Research Institute and the University of Toronto for a Postdoctoral Fellowship.

While working on her PhD, Soheila developed an interest in translational research in nervous system injuries and diseases.

"Damage to the brain and spinal cord results in irreparable functional deficits in affected individuals, because the central nervous system has a low ability for selfrepair," Dr. Karimi explains.

Intent on building her research career on therapeutic development for spinal cord injuries and diseases, Soheila recalls, "I was specifically interested in myelin repair, and MS is a leading myelin disorder...the complexity of MS disease is intriguing. It is like a puzzle that you need to put all your focus and energy to solve it piece by piece."

Along with her research team, Dr. Karimi's current work is focused on understanding MS pathogenesis and the development of regenerative therapies for MS.

"My team strives to develop new treatments that can facilitate the process of myelin repair so we can boost recovery and promote the regeneration of neural tissue.

Soheila knew from a young age that she wanted to be an educator. She admits that she has always had a passion for mentoring and guiding young people.

I am living my dreams now. "MS represents one of the most challenging conditions that often manifests in young adults resulting in decades of hardship. This motivates us to work harder and stay

"Being a professor was my dream job and

focused in our collective goal of finding a cure for MS.' Proud and grateful to be part of the MS research community in Canada, Dr. Karimi says, "The feeling that my research and expertise may advance the field and potentially help develop new treatments for individuals affected by MS is inspirational

and priceless."

As a SPRINT mentor, Dr. Karimi contributed to the training of the next generation of MS researchers by guiding SPRINTers through their project, Current Status of Neuroprotective and Regenerative Strategies for Myelin Repair in Multiple Sclerosis: A Systematic Review.

"This was an exciting experience to work closely with trainees from different backgrounds and disciplines, and make the learning experience exciting for them. Dr. Karimi says she was impressed by the dedication and hard work of the SPRINTers.

"I also liked the idea of challenging myself

by mentoring trainees who were specialized

in completely different areas of MS." Dr. Karimi remains grateful to her own mentors and advisors. In particular, Dr. David Schreyer and Dr. Valerie Verge. She acknowledges them both for having provided her with the "opportunities and the training that I needed at the beginning of my scientific journey in Canada." Dr. Karimi recalls that her postdoctoral training was "a rewarding experience that shaped my

the years. When not working, Dr. Karimi enjoys spending her time reading history books, travelling, hiking, cooking and baking.

Fehlings, for having encouraged her over

future career as an independent investigator.

She cites her postdoctoral advisor, Dr. Michael



Miceline Mésidor

orn in Port-au-Prince, Haïti, Miceline Mésidor received a bachelor's degree in statistics from the Centre de techniques de planification et d'économie appliquée, Haïti prior to obtaining her master's degree in public health (MScPH) with a specialization in biostatistics from the Université de Bordeaux in France.

A PhD candidate in public health, with a specialization in epidemiology at the Université de Montréal, Miceline currently works under the supervision of Dr. Marie-Pierre Sylvestre and Dr. Marie-Claude

Based on the suggestion of one of her supervisor's during her master's degree, Miceline decided to do her thesis on MS. After attending the endMS Summer School during the first year of her PhD, Miceline recalls, "It was then that I learned a lot about the disease and as a result my interest in working on it increased."

Her current supervisor, Dr. Sylvestre has been a great source of inspiration to Miceline, providing her with valuable advice over the

past four years. As a child, Miceline entertained the idea of becoming an architect. She later abandoned that idea when she discovered that unfortunately, her drawing skills weren't as

proficient as she'd hoped. Miceline's first job was as a statistician at a public health company. There, she developed a profound interest in public health. She later pursued studies in biostatistics as a means of acquiring knowledge in the field of health.

"In my first job, I used to work with longitudinal data, and I remained attached to this type of data in my master's and doctoral studies." Miceline's long term goal is to "embark on a university career and to work on the modelling of longitudinal data."

"Due to the complex evolution of MS, drugs as well as the use of health services, change over time. My doctoral project deals with the modelling of complex longitudinal processes and their interdependencies regarding MS." Expanding on her project, Miceline explains that she is examining the long-term effects of immunomodulatory drugs on the progression of MS, the use of health services and the course of the disease.

When asked about the challenges she faces in her field, Miceline replies, "The access to the data is done in a specialized centre and it is also necessary that the centre validates the data before I can use them, which sometimes delays me in my work."

As a biostatistician accustomed to working on studies writing codes and analyzing data, Miceline admits to having limited knowledge of basic science. As such, she recalls that her first day of SPRINT was akin to a child's first day in primary school.

Miceline says that fortunately, however, "Dr. Soheila Karimi, presented the project explaining everything in simple terms."

Through SPRINT, Miceline increased her general knowledge of MS. She says her learning ranged from neurological terms to certain neuroprotective and regenerative strategies for the repair of myelin in MS. She says in addition to now being "aware of emerging therapies in MS", she also "learned how to perform and write a

According to Miceline, SPRINT was a great way to connect with other students and researchers across Canada. Of her SPRINT project team, Miceline says, "We came from different universities and from different backgrounds, but we quickly adapted to each other. We helped each other throughout the program and learned to work as a team." "I believe that a cure for MS will be found in my lifetime and I will continue to work on the long-term effect of therapies on the progression of MS in order to contribute to the research.

When not researching, Miceline enjoys traveling, spending time with family and friends, reading and watching TV.

"In my first job, I used to work with longitudinal data, and I remained attached to this type of data in my master's and doctoral studies."



Nikki Ow

riginally from Singapore, Nikki Ow earned her master's degree (MA) in occupational therapy from the University of Southern California, in the United States and her bachelor's degree (BA) in occupational therapy from La Trobe University,

A McGill University PhD student, Nikki currently lives in Montreal, Quebec. When neurologists from the Montreal Children's Hospital approached Nikki's supervisor seeking help to develop a way to better measure outcomes in pediatric MS, Nikki says she "jumped at the chance to be part of this project."

Interacting with patients and listening to their stories about growing up with MS has provided Nikki with a unique perspective on how MS affects the lives of children "especially the disruptions in life, little things like having to miss school and catching up with schoolwork because they were hospitalized."

"Like many other autoimmune diseases, there is a lot of uncertainty that patients live with, not knowing when the next relapse will come, not knowing what will happen when they get another relapse etc., I think, with children, it is even harder for them to deal with because

they have to deal with the uncertainty." As a child, Nikki had an interest in analyzing people's thoughts and behaviors.

"I like understanding people on a deeper level, understanding their struggles and their beliefs and values. I think this is why I am doing quality of life research. Nikki's background is in rehabilitation, working as a pediatric occupational therapist.

Currently for her thesis, Nikki is working

on creating a profile of outcomes for

rare pediatric diseases, using MS as an

example — the rarity of which, Nikki says, 'makes it difficult to adhere to best practice guidelines when it comes to measurement development." Elaborating, she explains that research on

MS in children is "often limited to basic epidemiological research and the descriptions

of clinical features... Ultimately, Nikki's goal "is to put together a portrait of outcomes in pediatric MS, looking at the natural history and impact of treatment

on children and adolescents with MS." Nikki cites her supervisor Dr. Nancy Mayo as having been instrumental in guiding her on

her career path. Thanks to the SPRINT program and her SPRINT team of Karin Rustad and Dr. George S. Robertson, her "knowledge in cell biology and therapeutic agents in MS has also

"I have learned to appreciate and understand the importance of knowledge translation, the "bench to bedside" research...I have also learned a lot about conducting as in rodents."

When asked about the challenges she's faced in her particular field of research, Nikki says "With rare diseases, recruitment has always been difficult. It is even more difficult now because of the pandemic. Also, funding for rare diseases are also limited so competition

While Nikki hopes to see a cure for MS in her lifetime, she maintains that "regardless of whether there is a cure, we should pay equal attention to how people with MS can successfully manage their condition... having a good quality of life is possible for all patients with MS. I think researchers and clinicians should not forget that. Successful management is a partnership between the healthcare team and the patient.'

When not busy researching, Nikki enjoys partaking in sports and various types of workouts. When the weather permits, she loves going for long bike rides along the Lachine Canal, where she can appreciate



Dr. George S. Robertson orn in Glasgow, Scotland, George S.

Robertson received his bachelor's degree (BSc) in psychology and chemistry and his PhD in pharmacology from Dalhousie University in Halifax, Nova Scotia. Dr. Robertson is jointly appointed as a professor in the Departments of Psychiatry and Pharmacology at Dalhousie University. He conducts his research in the Brain Repair Centre at Dalhousie University. By the age of 11, George already knew that

he wanted to become a medical researcher.

"My father was a well-respected physician and

years old. At that time, there were no effective

treatments for MS. His relentless decline over

the next 15 years and eventual death from

diagnosed with MS when I was just eleven

complications related to MS, had a profound This tragedy drove George to pursue a career

in neuropharmacology — a road which has led him to research the development of drugs designed to halt neurodegenerative processes responsible for MS disease progression. Elaborating on his current work, Dr. Robertson

explains, "The mitochondrial calcium (Ca2+) uniporter (MCU) is strategically positioned to support the survival of demyelinated axons by buffering Ca2+ and stimulating energy production. My laboratory has recently published scientific papers showing that inhibiting the MCU in cultured cortical neurons and in the spinal cord neurons of mice reproduce mitochondrial deficits seen in the progressive MS brain. Our goal is to identify drug candidates for progressive MS based on the reversal of these MCU-dependent deficits in experimental models of MS.

"Dr. Trevor Owens has been instrumental in assisting my entry into the MS field...he taught my laboratory at Dalhousie University how to perform a mouse model of MS. This model has allowed my laboratory to investigate disease mechanisms in MS. Since then, he has generously taken the time to share his knowledge of MS with me."

Jock Murray, V. Wee Yong, Amit Bar-Or and Jack Antel as also having mentored his career in MS research. According to Dr. Robertson, the most important contribution an investigator can

Professor Robertson cites Drs. Virender Bhan,

make in science is to train a student whose achievements bring success and national recognition. He cites his own mentorship of Drs. Stephen J. Crocker and Craig S. Moore, as examples. Dr. Crocker was his first doctoral student and is now an associate professor in

the Department of Neuroscience at the University of Connecticut, Dr. Moore is now a Tier 2 Canada Research Chair in Neuroscience and Brain Repair at Memorial University of Newfoundland. Dr. Robertson adds that Dr. Moore's career development was further facilitated by his participation in SPRINT. George maintains

that educational programs such as SPRINT are integral to the creation of the next generation of MS researchers. "The SPRINT program is an outstanding example of the high quality of training provided by the MS Society of Canada."

"Thanks to strong leadership by MS societies around the globe, MS has gone from a disease that was difficult to diagnose not long ago to one for which we now have treatments which suppress disease relapses."

Regarding the current pandemic, George says, "COVID-19 has crippled fund-raising efforts essential for the support of the MS community. It is therefore crucial that COVID-19 not be allowed to impair the ability of the MS Society of Canada to continue to support those afflicted with MS and our research efforts in this field.

Further to his involvement in MS research, Dr. Robertson also studies Parkinson's disease and stroke. He believes that neurodegenerative mechanisms common to Parkinson's disease and stroke are also involved in MS. "My laboratory's work in Parkinson's disease

and stroke has therefore informed the

scientific approaches we use to elucidate

disease progression in MS. When not teaching, researching or mentoring, George enjoys spending his time, "Playing golf with my wife and friends at Northumberland Links near our summer home in Pugwash, Nova Scotia.

the neurodegenerative mechanisms that drive

"The SPRINT program is an outstanding example of the high quality of training provided by the MS Society of Canada."



received her bachelor's in psychology (BSc) with a concentration in neurosciences and a minor in biology, from Bishop's University. Camille then obtained her master's in immunology from the University of Sherbrooke, where she is currently working on her PhD in pharmacology.

case of MS, it is as if one of the soldiers has decided to help the enemy instead. "My mom was diagnosed with MS before I was born. Her EDSS (Expanded Disability Status Scale) score is low, so she doesn't have

Likening the immune system to an army,

Camille explains that while all soldiers are

supposed to fight against the enemy, in the

Camille explains that although her mother has suffered from the occasional relapse, she

avoids taking any medications because the side effects are often far worse than any of her actual MS symptoms.

experience with MS. However, she does admit that her own family and friends have always supported her academic pursuits. Camille also mentions that Marjan Gharagozloo (a former SPRINTer) and Shaimaa Mahmoud, have helped her achieve some of her more recent goals.

herself and to always strive to achieve more.

Reflecting upon her past, Camille confesses that her years in elementary school were so difficult, she never imaged she'd end up where she is today — pursuing a PhD in pharmacology.

"It is important to believe in yourself and push

yourself, because everything is possible.

"In elementary school, I wasn't able to do an oral presentation in front of 15 people and now I can present in front of 500 people without being afraid, so everything is possible. Through SPRINT, Camille says she was able

in MS." She says that SPRINT allowed her to "start to focus on other aspects of the disease," in addition to helping her hone her communication skills.

to learn more about MS and to "network and keep up-to-date with the current research

Disease Modifying Therapies for MS, Camille admits, "I've learned a lot about the DMTs, adherence and persistence. I've also learned about punctuality, organization, and time management." An avid baker, Camille enjoyed baking brioches (and her famous "coffee bars") for her colleagues at the lab. Camille describes their afternoon "tea times" as laughter filled

When asked about her SPRINT group project,

Geographical Variations in Adherence to

re-energized over baked goods. When asked about her long-term plans, Camille explains that she'd like to pursue what she refers to in French as, "la vulgarisation scientifique" or, the popularization of science. "For me it is important to bring "hard-core" really focused and/or fundamental science

moments when she and her former colleagues





Now investigating the role of cannabinoids on brain inflammation, Camille explains that her decision to focus on MS is largely due to its intriguing complexity. "I'm interested in the

interplay between the central nervous system

and the immune system (neuroimmunology).

any chronic symptoms."

Camille maintains that she didn't pursue this line of research solely due to her mother's

Both Marjan and Shaimaa were instrumental in Camille's decision to apply for SPRINT. She says they both encouraged her to believe in

"If you want your research to have some kind of impact, you need to be able to communicate in English." In order to improve her English, Camilla says

McDonald's in British Colombia.

back to the people who need it." Camille specifies that by "people" she means society at large, and even more precisely, "every single person."

that for a brief period she chose to live out West, where she secured her first job at a

University of Regina. "I chose to study MS because of the many people I know that live with it, and I could not pass up the opportunity to study it,"

Karin explains. Almost 20 years ago, Karin's aunt was diagnosed with MS.

"I watched her turn into a shell of herself... she was so full of life and laughter, but by the end she was unable to leave her bed. It was devastating to watch."

particularly difficult time with my project I always come back to the reason that I started it in the first place - my aunt, and all of the other people that I know that have MS... Amongst the many people who have encouraged Karin throughout her research career, she cites, "Dr. Josef Buttigieg, Dr. Mel Hart and Dr. Marianne Jacobsen." Further to their mentorship, Karin adds that

Currently, for her thesis, Karin is working on

testing a novel drug — one that will hopefully

alleviate the inflammatory response in MS by

specifically targeting autoimmune cells.

"My specific therapy theoretically could

be the starting point for improvements in

repair and from there quality of life as well. If we can stop the body from attacking

itself then current repair methods may be

"When I am struggling to push through a

more effective."

SPRINT taught her "so much about MS, about current research in the field, and gave me the opportunity to create a significantly more expansive network."

I'm not doing this for me, I'm doing it for them."

opportunity to learn from patients and leaders in the field. She says that working with fellow SPRINTer Nikki Ow, and SPRINT mentor Dr. George S. Robertson, proved to be an invaluable experience.

As a bench scientist, Karin appreciated the

"I learned a lot from their different perspectives that I would not have considered Having earned a Bachelor of Education

degree from the University of Regina, Karin was initially trained to be a high school biology teacher. However, despite her love for teaching, that particular work environment didn't suit Karin as well as she'd imagined. Her eventual decision to change careers worked out for the best, "I am very happy

with where I have ended up." Karin's first job was as a lifeguard and swimming instructor.

"Working at the pool taught me how to think on my feet and problem solve, as well as how to lead and to communicate effectively in various situations. The biggest thing that it taught me, relevant to my current work, was how to work hard and push through problems and complications that arise."

While Karin sincerely hopes that a cure for MS will be found in her lifetime, she feels "optimistic about that breakthrough happening in the not so far future." SPRINT enabled Karin to improve many

of her skills, the most important of which, she believes was, "learning to be a better communicator — especially through distance methods." Additionally, learning how to convey

knowledge to a wide audience, and sifting through vast amounts of information in unfamiliar fields are new skills that Karin now employs on a daily basis.

When not working on her thesis, Karin spends time at her cabin up North. Otherwise, she relaxes by reading or going for walks, always ensuring that her phone is turned off. "Sometimes I just need to only be available for myself so that I can slow down and re-center myself amidst the chaos."

"Working at the pool taught me how to think on my feet and problem solve, as well as how to lead and to communicate effectively in various situations."

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2020-2021 endMS SPRINTers Maria-Elizabeth Baeva University of British Columbia **Emily Kamma** University of British Columbia Wendy Lasisi Memorial University University of Saskatchewan **Cole Libner** Brian Lozinski University of Calgary Dr. Monique Marylin Almeida University of Alberta University of British Columbia Dr. Huah Shin Ng Dr. Simon Thebault University of Ottawa

2020-2021 endMS SPRINT Mentors

Dr. Sarah Donkers **Dr. Jason Plemel**

University of Saskatchewan

University of Alberta

2020-2021 endMS Education and **Training Committee Membership** Director, endMS National Training Program

Dr. Christina Wolfson

McGill University Dr. Nathalie Arbour Co-Director, endMS National Training Program Université de Montréal (U de M)

Co-Director, endMS National Training Program Dr. Marcia Finlayson Chair of the endMS SPRINT Committee

Queen's University Elisea De Somma SPRINT Alumni York University

Dr. George S. Robertson Chair of the endMS Peer Review Committee Dalhousie University

Dr. Jacqueline Quandt University of British Columbia University of Alberta Dr. Penelope Smyth **Anik Schoenfeldt**

Program Manager, endMS National Training Program Research Institute - McGill University Health Centre

2020 endMS Summer School Collaborators

Dr. Robert Carruthers 2020 endMS Summer School Host University of British Columbia Michelle Eisner

2021 endMS

2020 endMS Summer School Coordinator

Summer School Collaborators Dr. Charity Evans 2021 endMS Summer School Co-Host

University of Saskatchewan Dr. Michael C. Levin 2021 endMS Summer School Co-Host

University of Saskatchewan Dr. Valerie M.K. Verge 2021 endMS Summer School Co-Host

University of Saskatchewan



Message from 2021 endMS **Summer School Hosts**

With over 250,000 kms, Saskatchewan has the most extensive roadway system of any Canadian province. Despite this, we are taking the 2021 endMS Summer School off the grid.

The Saskatchewan hosts are excited about bringing innovative, interactive sessions and workshops into your home. They're busy brainstorming now, so stay tuned for more information!



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Dr. Michael C. Levin

Michael C. Levin, MD, is the inaugural Saskatchewan Multiple Sclerosis Endowed Clinical Research Chair and Professor of Neurology and Anatomy, Physiology, & Pharmacology at He received his Bachelors' of Science

degree in chemistry with special honors at the George Washington University, his medical degree at Pennsylvania State University and basic neuroscience training at The Salk Institute. Dr. Levin completed his residency training in neurology at The New York Hospital/Cornell Medical Center Memorial Sloan Kettering Cancer Center where Drs. Fred Plum and Jerry Posner mentored him during his residency including while he was chief neurology resident. He then completed his Multiple Sclerosis post-doctoral fellowship in the Neuroimmunology Branch at NIH with Dr. Henry McFarland and Steve Jacobson

he moved up the ranks to professor with tenure, led the MS clinic and developed a translational research program based on the role that dysfunctional RNA binding proteins play in the pathogenesis of neurodegeneration in MS and relevant MS models. His work has also been published in The New England Journal of Medicine

He was recruited to the University of Tennessee in Memphis where

Nature Medicine, Annals of Neurology, Neurology, the Journal of Comparative Neurology, and the Journal of Neuroscience Research. Dr. Levin has received more than 30 awards for academic excellence and his work has been recognized by the National Multiple Sclerosis Society, American Academy of Neurology, the Society for Neuroscience and most recently, by a Canadian 'Science, Technology, Innovation and Collaboration' Award for the discovery of stress granules in brain tissue of an MS patient.

Dr. Levin is married to his lovely wife of more than 29 years, Dr. Audrey Zucker-Levin, an academic physical therapist. He has two strappingly handsome sons and is an avid sailor and scuba diver.



Dr. Charity Evans Dr. Evans received her Bachelor of Science in Pharmacy and PhD (Pharmacy), both from the University of Saskatchewan. She completed a post-

doctoral fellowship at the University of

British Columbia where she was first

introduced to MS research. During this time, Dr. Evans attended 3 endMS Summer Schools, and was a participant in the inaugural SPRINT cohort. In July 2012, she returned to the University of Saskatchewan

where she is a currently an Associate Professor in the College of

epidemiology in MS, with a particular interest in adherence She is also the Director of the Saskatchewan Continuing Education for Pharmacy Professionals program and Director of the provincial medication information service, medSask

Pharmacy and Nutrition. Her research focuses on pharmaco-



Dr. Valerie Verge Dr. Valerie Verge is a neuroscientist,

Professor of Anatomy, Physiology and Pharmacology and Director of the Cameco MS Neuroscience Research Centre at the University of Saskatchewan. She has a longstanding federally funded research program that focusses on devising therapies

that enhance the intrinsic ability of the nervous system to repair itself She is a passionate advocate for neuroscience research nationally and internationally and the recipient of many distinctions including being the Saskatchewan WaMS (Women against MS) 2019 honoured

Dr. Nadine Akbar recently began a new position as Research Chair in Community Connection at Humber River Hospital in Toronto. In her new role, Nadine will be leading an independent research program aimed at developing and evaluating digitally delivered clinical and community-based programs to help improve health outcomes of those living in the Northwestern Toronto area. She hopes to continue pursuing MS research as part of her new role.

PhD in Biochemistry and Molecular Biology at the University of Calgary in June. Rhiannon is currently working as a research associate at Medlior-Health Outcomes Research in Calgary — using many of the skills developed in the SPRINT program! Dr. Andrew Caprariello is a senior

scientist at a start-up biotech company based in Cleveland, Ohio that focuses on remyelination therapies for MS. Andrew is currently testing lead compounds for efficacy in animal models of MS. Dr. Courtney Casserly is an assistant professor of Neurology at the

University of Western Ontario in the Multiple Sclerosis Clinic. She founded a Neuromyelitis Optica Spectrum Disorder and MOG-associated disease (NEMO) clinic in London, ON. Courtney is the principal investigator for a trial looking at Fampyra and Optic Nerve Function (FAMPON). Partly inspired by the endMS Summer School and the valuable skills and contacts she made during her time as a SPRINTer, Courtney pioneered the first annual Clinical Neurological Sciences Research Boot Camp for residents and fellows in London, Ontario, which took place on Sept 15, 2020.

research scientist at the Danish CNS Pharmaceutical company Lundbeck in Copenhagen, Denmark. Currently, Pia is working on ex vivo imaging of acute slices of a transgenic mouse with a fluorescent probe for mitochondrial function, using techniques to facilitate the crossing of brain barrier. Pia remains in contact with much of her Canadian network. Dr. Miguel De Avila is working with

Apotex Inc., as a sourcing specialist.

Miguel is leading sourcing activities

for active ingredients as well as key

starting materials and excipients

Dr. Pia Crone Christensen is a

and North America. year as an assistant professor at the College of Medicine at the University of Saskatchewan. Sarah is currently running a large (120 participants) MS rehabilitation research study (IPAC-MS) with Dr. Katherine Knox and fellow SPRINT alumni and former SPRINT mentor Dr. Charity Evans. She was recently awarded the top ranked establishment grant from the Saskatchewan Health Research Foundation, titled: Building Towards a Neurorecovery Model of Care in MS. Sarah is also a current SPRINT mentor.

defended his PhD in Biochemistry at Dr. Rhiannon Campden defended her the University of Calgary in June 2019, under the supervision of Dr. Robin Yates. Ben is currently enrolled in medical school at the University of Calgary and is expected to graduate with a combined MD/PhD in 2022. Dr. Afolasade Fakolade finished

Dr. Ben Ewanchuk successfully

her MS Society funded postdoctoral fellowship at the University of Ottawa with Dr. Lara Pilutti and started as an assistant professor at the School of Rehabilitation Therapy at Queen's University on July 1, 2020. Afolasade's lab is focused on research related to promoting healthy behaviors, particularly physical activity, for people with advanced MS and their family caregivers. Afolasade hopes to continue training the next generation of MS researchers to find innovative ways to support people with MS, and their caregivers, so they can lead healthy and active lives within the community.

Negar Farzam-kia is completing her PhD in Neuroscience at the University of Montreal under the supervision of Dr. Nathalie Arbour. Negar's research focuses on immunological mechanisms implicated in MS pathobiology.

Dr. Marjan Gharagozloo is currently

a post-doctoral fellow in Dr. Peter Calabresi's lab at Johns Hopkins. Marjan was awarded an FRQS (Fonds de la recherche en santé du Québec) postdoctoral grant for a multidisciplinary project to discover the molecular mechanisms underlying the inflammatory response of glia in multiple sclerosis. the completion of her PhD in

neuroscience in Dr. Alexandre Prat's lab at the Research center of Centre hospitalier de l'Université de Montréal (CRCHUM), after returning from maternity leave following the birth of her daughter. Elizabeth's research focuses on characterizing regional provided by suppliers based in Europe distinctions in the blood-brain barrier, as well as novel mechanisms by which pathogenic T lymphocytes transverse **Dr. Sarah Donkers** is starting her third the blood-brain barrier in MS, thereby leading to lesion formation.

Dr. Yohannes Haile has been promoted to senior scientific evaluator at Health Canada.

Dr. Heather Hanwell is on leave from her mixed methods research at the University of Toronto.

Dr. Rajiv Jain is continuing his postdoctoral fellowship with Dr. Wee Yong at the University of Calgary. The focus of Rajiv's post-doctoral fellowship is to look at how B cells interact with CNS elements to promote MS pathology.

to work as medical science liaison with EMD Serono in their Neurology and Immunology Division. Recently engaged, Camille is planning a flamingo themed wedding with her fiancé.

Dr. Camille Juzwik is continuing

Megan Kirkland is continuing her doctoral and medical studies at Memorial University. She is expected to graduate with a combined MD/PhD in 2022.

Dr. Kaarina Kowalec began a tenuretrack assistant professor position at the University of Manitoba in January 2019. Kaarina has successfully acquired funding from the 2019 US Department of Defense Multiple Sclerosis Research Program and the Consortium of Multiple Sclerosis Centres to investigate the correlation between psychiatric disorder polygenic risk scores and MS disease activity and progression in Canada, the USA and the United Kingdom.

Dr. Hyunwoo Lee is continuing his postdoctoral fellowship with Dr. Robin Hsiung at the University of British Columbia. Currently, he is working on brain imaging changes associated with aging and dementia. Dr. Sandra Magalhaes is a research

associate at the New Brunswick Institute for Research, Data and Training, the provincial administrative data centre in New Brunswick. Chantel Mayo is completing her PhD at the University of Victoria, and

just began her clinical residency in neuropsychology at Hamilton Health Sciences. Dr. Craig Moore is an associate professor in the Division of

Biomedical Sciences and Discipline of Neurology at Memorial University of Newfoundland. In the past year, he has been renewed as Tier 2 Canada Research Chair in Neuroscience and Brain Repair (2019-2024). Craig currently lives in St. John's with his wife and 4-year old daughter.

Sarah Neil is continuing to work as a genetic counselor in Vancouver, at BC Women's Hospital and at a private fertility clinic.

Dr. Katerina Maria Othonos completed her PhD in Neuroscience in February 2020 at the University of British Columbia under the supervision of Dr. Douglas Allan. Currently, she is part of the first-year medical program at the University of

Dr. Evelyn Peelen is working as a scientist at the clinical-stage biopharmaceutical company, Immunic AG, in Munich, Germany.

Julie Petrin is completing her PhD

and is set to defend her thesis this fall. Supervised by Dr. Marcia Finlayson at Queen's University, Julie's research focuses on access to healthcare services for Canadians living with MS.

professor at the University of Alberta, and is excited to make the transition from SPRINT alumni to SPRINT mentor this year. Jason is already inspired by his SPRINT team's enthusiasm. **Dr. Jim Rogers** completed his MD

Dr. Jason Plemel is an assistant

training and graduated with a combined MD/PhD at the University of Calgary with the class of 2020 this spring. Jim is currently in the first year of his residency in the Rural Family Medicine program in Red Deer, through the University of Alberta.

completing her doctoral studies in Microbiology and Immunology at the University of Western Ontario under the supervision of Dr. Steven Kerfoot. Her research focuses on characterizing B cells in the inflamed CNS of an animal model of multiple sclerosis, and determining their susceptibility to therapeutic depletion. Dr. Jordan Warford is approaching the conclusion of his first year as

senior director of research for Nova Scotia Health where he presently oversees strategy and operations provincially. Jordan and his wife welcomed two little boys into their home this past February and redefined the meaning of cocooning during COVID-19. He remains connected to the MS community while collectively seeking opportunities to enhance the clinical research capacity of the network.

www.mssociety.ca/trainingprogram

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

For Summer School and/or SPRINT application

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The endMS Research and Training Network is a nationwide initiative formed to accelerate discovery in the field of multiple sclerosis in Canada. Through innovative training and funding programs, the endMS Network aims to attract, train and retain MS researchers and increase opportunities to conduct MS research in Canada. The endMS National Training Program is

an initiative of the endMS Network. It is led by Dr. Christina Wolfson and funded by the MS Society of Canada through the MS Scientific Research Foundation.

