Project title	Dissecting the immune dynamics of SARS-CoV-2 infection and vaccination		
Study level(s)	☐ MSc	☒ PhD	☒ Postdoctorate
Principal investigator(s)	Martin A. Smith, Hélène Decaluwe, Etienne Caron		
Project duration	1-3 years		
Start date	Earliest convenience		

Date of posting: 2022-02-21

Research laboratory presentation

The Smith Laboratory investigates complex diseases through the development and application of methods leveraging the latest developments in genomic technologies and computational biology. We manage sequencing hardware (Oxford Nanopore PromethION, GridION, MinION mk1C), open-source laboratory automation robotics (Opentrons) and dedicated computing (GPU server with ridiculous amounts of RAM) to discover new insights into disease aetiology and genome biology. Dr Smith is a computational biologist with broad expertise in genomics, bioinformatics and machine learning. Dr Decaluwe is a clinician researcher who specializes in pediatric immunology. Her laboratory uses diverse molecular and cytological methods to study the regulation of T cell activity and T cell exhaustion, a differentiation pathway that precludes memory T cell development and limits optimal T effector cell functions. The Caron Laboratory leverages immuno-peptidomics, bioinformatics and high-throughput mass-spectrometry data generated in-house to study the immune dynamics of cancer and infection.

Together in the Cancer and Immune Disorder Axis at the Sainte-Justine University-Hospital Research Centre and distinct departments at the University of Montreal, we harmonize our mutual expertise and enthusiasm for research to discover new biological processes and innovative therapeutic strategies.

Research project description

We are recruiting a determined individual to join our highly collaborative and multi-disciplinary research environment. The incumbent will champion impactful research projects pertaining to the study of the immune dynamics of SARS-CoV-2 infection and vaccination. In particular, we seek to comprehend why certain individuals respond well to vaccination and infection, why others do not and how can we predict these outcomes?

This well-funded project will involve generating, integrating and analyzing rich datasets of Oxford nanopore and single-cell RNA sequencing data derived from biospecimens longitudinally acquired from a unique cohort of over 500 healthcare employees. The incumbent will have the opportunity to learn unique techniques (both experimental and computational) and develop their own research program in a modern, multi-cultural research environment with established collaborative networks and cutting-edge infrastructure.

Required training and profile

Candidates at different career stages are encouraged to apply. The incumbent should have demonstrated research experience with genomic data, computational skills involving data processing and statistics, programming abilities and familiarity with best practices in data science/bioinformatics. The ability to work in a team, a determination to pursue research excellence, good communication skills and efficient time management should also characterize the incumbent.

Conditions
Although international candidates are invited to apply, Canadian citizens, permanent residents and candidates with permission to work in Canada will be privileged in the selection process due to the intended starting date of this opportunity.

Submit your application
Candidates must send the required documents before **03/2022** to **Martin Smith** at martin.smith@umontreal.ca.

Please provide:

√ *Curriculum vitæ*

√ Most recent transcripts

√ Cover letter

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Equity, diversity and inclusion
The masculine gender is used without discrimination and for the sole purpose to facilitate reading. The CHU Sainte-Justine subscribes to the principle of equal access to opportunities and invites women, members of visible and ethnic minorities, persons with disabilities and Indigenous people to apply. We would appreciate it if you could inform us of any disabilities that would require technical and physical accommodation adapted to your situation during the selection process. Please be assured that we will treat this information as confidential.

Studies at the CHU Sainte-Justine Research Center
Pursue your graduate or postdoctoral studies at the **CHU Sainte-Justine Research Center**, and be one of the 500 students, fellows and interns involved in accelerating the development of knowledge in the field of maternal, child and adolescent health, whether in basic or clinical research. Under the supervision of prominent scientists, especially in leukemia, rare pediatric diseases, genetics, perinatology, obesity, neuropsychology and cognition, scoliosis and rehabilitation, you will have the opportunity to work with multidisciplinary scientific teams and collaborators from all over the world.

About the CHU Sainte-Justine Research Center
CHU Sainte-Justine Research Center is a leading mother-child research institution affiliated with Université de Montréal. It brings together more than 200 research investigators, including over 90 clinician-scientists, as well as 500 graduate and postgraduate students focused on finding innovative prevention means, faster and less invasive treatments, as well as personalized approaches to medicine. The Center is part of CHU Sainte-Justine, which is the largest mother-child center in Canada and the second most important pediatric center in North America. More on research.chusj.org