



Project title	Exploiting the potential of stem cells as an innovative immunotherapy for childhood cancer through the use of specific promoters		
Study level(s)	<input type="checkbox"/> MSc	<input type="checkbox"/> PhD	<input checked="" type="checkbox"/> Postdoctorate
Principal investigator(s)	Élie Haddad, M.D. PhD,		
Project duration	3 to 5 years		
Start date	September 2024		

Date of posting: 2024-05-22

### Research laboratory presentation

Élie Haddad's laboratory is studying various aspects of the human immune system, spanning from stem cells to immunotherapy, in both fundamental and translational research. The project will be conducted in a multidisciplinary environment, involving virologists and immunologists. The CHU Sainte-Justine will be the administrative center.

### Research project description

A Post-Doctoral position is currently open in the lab. Recently, our laboratory has developed specific synthetic promoters that allow the expression of a transgene exclusively in targeted cell subpopulations. These specific promoters have the potential to have a major impact on cell and gene therapies because they confer specificity - both for cell subtype and level of maturation-when using stem cells such as hematopoietic stem cells or induced pluripotent stem cells (iPSCs).

Despite the spectacular results of chimeric antigen receptor (CAR) technology in T lymphocytes (CAR-T) and NK cells (CAR-NK) in hematological malignancies, this method has failed so far in solid tumors. In our project, we propose to modify hematopoietic stem cells (HSCs) and not T lymphocytes or NK cells. If we were to introduce CAR into HSCs, all blood cells would express it, which would not be clinically acceptable. Our team has developed specific synthetic promoters that restrict CAR expression to T and NK cells. Our hypothesis is that this strategy could be more effective in the context of solid tumors and would cause fewer side effects than usual CAR therapies. We will test the effectiveness and safety of this strategy *in vitro* and *in vivo* in a humanized mouse model. In addition, we propose to understand the molecular mechanism of action of these synthetic promoters as well as their characteristics. More precisely, we aim to define the interaction partners of these synthetic sequences, the natural function of these sequences and the mechanisms underlying their specificity. Finally, we wish to develop the use of these synthetic promoters in the context of induced pluripotent stem cells (iPSCs).

### Required training and profile

- Hold an appropriate degree for the targeted level (PhD or M.Sc. with a MD degree without the right to practice for post-doctoral fellowship) and excellent academic record;
- Demonstrate motivation and autonomy to bring this project to term;



- Possess a strong knowledge in immunology and experimental techniques (eg. Flow cytometry, molecular biology);
- Have experience with cell culture (primary and cell lines).
- Have good communication and organization skills;
- Established publication records
- Speak and write in English.
- Although University of Montreal and the CHU Sainte-Justine are french-speaking institution, it is not required that the candidate speaks and/or understand French.

### Conditions

The student must apply for admission at the University of Montreal as a postdoctoral fellow and will comply with all applicable eligibility conditions.

Postdoctoral fellows at the CHUSJ are Scholarship recipient postdoctoral fellows (stagiaires postdoctoraux boursiers (SPB)). They are considered as researchers in training and are not employees of the CHUSJ. They are paid in the form of a scholarship (stipend), not a salary. For this reason, CR-CHUSJ postdoctoral fellows are not eligible for employment insurance, parental insurance, pension plans and other benefits exclusive to employees. Taxes will be deducted at the source.

The CHU Sainte-Justine has a minimum remuneration policy for all its students and postdoctoral fellows. Remuneration may come from the researcher's funds or from an external nominal award. The candidate will have to apply for external scholarships to obtain a nominative award.

The duration of research development is conditional:

- On the availability of research funds;
- To the project's progress;
- Eligibility of the intern to renew its status as postdoctoral fellow at the university.

### Submit your application

Interested candidates are invited to submit their application by email to Dr **Élie Haddad** at: [elie.haddad@umontreal.ca](mailto:elie.haddad@umontreal.ca) .

Please provide:

- ✓ *Curriculum vitae*
- ✓ Most recent transcripts
- ✓ Cover letter
- ✓ References

### Elie Haddad, M.D. Ph.D.

Full Professor, Department of Pediatrics, Faculty of Medicine, Université de Montréal  
Clinician, Clinical Immunology and Allergy, CHU Sainte-Justine



### 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](http://research.chusj.org)

