



CHU Sainte-Justine
Research Center
Mother and Child
University Hospital Center

Université
de Montréal

Project title	<i>Applying machine learning techniques to validate a novel pediatric lung function test.</i>		
Study level(s)	<input type="checkbox"/> MSc	<input type="checkbox"/> PhD	<input checked="" type="checkbox"/> Postdoctorate
Principal investigator(s)	Francine M. Ducharme		
Project duration	1-2 years		
Start date	As soon as possible		

Student position

Funded postdoctoral fellowship in biostatistics, machine learning and clinical epidemiology, applied to lung function and pediatric asthma.

Research laboratory presentation

Dr. Ducharme's clinical laboratory tests several instruments and oscillometry techniques applicable to children aged 1 to 17 years old. Indeed, asthma guidelines recommend periodically assessing lung function (i.e., spirometry) in children to properly adjust the treatment. Now, for the vast majority of children with asthma, doctors do not use spirometry, because of insufficient cooperation in young children and/or lack of access. An interesting alternative is the use of oscillometry performed in spontaneous breathing, which is effortlessly for the child, using portable devices newly (or in the process of being marketed) in Canada. This research program aims to provide reliable, valid and accessible measurement of lung function in children at the doctor's office or at home.

Research project description

A large structured cohort study has collected data in more than 600 children. These data will serve to establish all pre-requisites to allow uptake of this technique in clinical practice.

The objective of the post-doctoral training are to:

- Establish the best parameters to identify airway obstruction and response to therapy;
- Propose threshold values to distinguish between normal and children with airway obstruction by machine learning;
- Propose threshold values to distinguish between children with mild, moderate, and severe obstruction airway obstruction and to identify clinically significant improvement or deterioration by machine learning;
- Propose a simple clinical interpretation algorithm for use in practice;
- Develop and test an online training module for health professionals;
- Develop skills for writing manuscripts, preparing presentations and writing grant applications.

Required training and profile



CHU Sainte-Justine
Research Center
Mother and Child
University Hospital Center

Université
de Montréal

- Completed PhD in biostatistics, epidemiology, machine learning or related sciences or an MD with a master or PhD with training in statistics, epidemiology, or machine learning or related sciences
- Advanced statistical analysis skills and skills in machine learning (artificial intelligence)- Random forest, CART, etc.
- Excellent academic record
- Excellent knowledge of computers and softwares (Office Suite, SPSS, SAS, R, etc.)
- Excellent ability to review scientific literature
- Excellent competence in written and oral English. Linguistic competence in French is an asset.

Conditions

A research grant, reserved for this project, will cover the scholarship for the first 1 to 2 years.

Submit your application

Candidates must send the required documents to Dr Francine M. Ducharme by email to francine.m.ducharme@umontreal.ca

Please provide:

- ✓ *Curriculum vitae*
- ✓ Most recent transcripts
- ✓ Cover letter
- ✓ 2 References on request

Francine M. Ducharme, MD, MSc, FRCP(c), CAHS

Professor, Departments of Pediatrics and of Social and Preventive Medicine
Tel : (514) 345-4931 ext. : 4398
CHU Sainte-Justine, Room 17.B.000
1375 Côte Ste-Catherine
Montréal, Qc, H3T1C5, Canada

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



CHU Sainte-Justine
Research Center
Mother and Child
University Hospital Center

Université 
de Montréal

