

**APPLICATION FORM FOR FELLOWSHIPS**  
**Neurogenetic Fellowship- 1 year program**

Program Information (please append description):

**Number of fellowship positions requested: 2/year**

**Academic affiliation:** McGill University Health Center (MUHC)

**Name of hospitals involved in training and percentage of time spent by the fellow in each institution:**

- Montreal Neurological Hospital and Institute, CUSM
- Montreal Children's Hospital, CUSM
- Montreal General Hospital, CUSM

The percent of time spent by the fellow at each institution will depend on the focus of the Neurogenetics fellowship, and is flexible. For example, a fellow with a Pediatric Neurology background may decide to spend more time at the MCH as compared to a fellow with an Adult Neurology background. In addition, Fellows with a particular interest in the Neurogenetics of Neuromuscular diseases may chose to spend more time the Neuromuscular and Neuropathy clinics at the various institutions.

**Background:**

The field of Neurogenetics is rapidly expanding, especially given the technological advances in the past decades and the continued progress and developments in the field. The genetic etiology of many disorders has been identified, enabling improved diagnosis, prognositication and genetic counseling regarding familial recurrent risk. The identification of the underlying genetic etiology also allows improvement understanding of the pathogenesis of the underlying disorder, and in some cases the institution or development of treatments targeting the specific genetic defect. With increased frequency, neurologists have to organize and order genetic tests for their patients, and in turn, interpret the results.

**Research activity:**

The fellow in Neurogenetics will have access to multiple clinicians and researchers, and will have the opportunity to chose a clinical or basic science research topic in the subspecialized field of his/her interest such as: Neuromuscular, Neurodegenerative, Metabolics, Movement disorders, Ataxia, Developmental Delay, Brain malformations, Leukoencephalopathies, Mitochondrial disorders...

For the one-year Neurogenetic fellowship program, it will be expected that the fellow be involved in at least one small research project during his/her Fellowship with a maximum of 3 dedicated months.

**Publications:**

It will be expected that the fellow submit at least one paper as first author, and will also likely be involved in the writing of a review or book chapter.

**Mission:**

This Fellowship in Neurogenetics aims to provide the Adult or Pediatric Neurologist with the knowledge, experience and training required to be able to identify a patient with a potentially heritable or genetic disorder, obtain a family history and collateral information, think of a differential diagnosis, order the appropriate work-up and genetic testing, interpret the results and explain to the proband and family the implications of the results. In addition, this Fellowship aims to make the fellow familiar with the commonly used Neurogenetic laboratory techniques and strategies such as PCR, linkage analysis, sequence analysis, whole-exome/genome sequencing analysis, SNP genotyping analysis, homozygosity mapping.

**Outline how intended fellowship will enhance residency training:**

This Fellowship will enhance the residency training in multiple ways:

- Provide instructions to residents and medical students at a level appropriate to their clinical education and professional competence.
- Willingly share knowledge with others with whom they are associated, thus ensuring the most effective delivery of health care to patients.
- Be involved in complex Neurogenetic cases, which will lead to discussion and case-based teaching by the fellow with the Neurology residents.
- Take part in Neurogenetics Rounds, where neurologists, medical geneticists genetic counselors, residents and allied professional are present.
- Teach at Neurology Residents' Academic half day.

**Name of the Fellowship Program Director:** Dr. Bernard Brais

**Names of the Teaching Faculty:**

**Eva Andermann :**

Founder of the Neurogenetics clinic at the MNH where she sees patients and families with a wide range of Neurogenetic disorders.

**Genevieve Bernard:**

Runs the Pediatric Movement disorders and ataxia clinic at the MCH, Leukodystrophy and Neurometabolic clinic at MCH and part of the Ataxia and adult leukoencephalopathy clinic at the MNH. Dr Bernard also works at the CHU-Sainte-Justine in the movement disorders clinic and the leukodystrophy clinic. Dr Bernard's laboratory focuses on the genetic causes of pediatric neurodegenerative disorders, and more specifically on leukodystrophies /inherited white matter disorders and pediatric movement disorders.

**Bernard Brais:** Dr Brais is the co-director of the neuromuscular group of the MNH. He is part of the Neurogenetic Clinic and the Ataxia and adult leukoencephalopathy clinic at the MNH, as well as the medical director of the Neuromuscular clinic at the Centre de Réadaptation Marie-Enfant of the CHU-Sainte-Justine and the Neuromuscular clinic of the Centre de réadaptation Lucie-Bruneau. He investigates the genetic basis of neurogenetic disorders with founder effects in Quebec, with an increasing focus on disorders with ataxic

manifestations such as Autosomal Recessive Spastic Ataxia of Charlevoix-Saguenay (ARSACS).

**Colin Chalk:** Dr Chalk is a Neurologist at the MGH and specializes in Peripheral Neuromuscular disorders. He is part of the Peripheral Nerve and Myasthenia clinics at the MGH.

**Marie-Emmanuelle Dilenge:** Dr Dilenge is a Pediatric Neurologist with a focus of rehabilitation medicine and pediatric multiple sclerosis. She is part of the Neurofibromatosis clinic at the MCH.

**Erin O’Ferrall:** Dr O’Ferrall is an adult Neurologist with a subspecialty in Neuromuscular disorders. She is part of the Neuromuscular clinic at the MNH, the Peripheral Nerve clinic and Myasthenia clinic at the MGH and the Neuromuscular clinic of the Centre de réadaptation Lucie-Bruneau.

**Maryam Oskoui :** Dr Oskoui is a pediatric Neurologist with a focus on Neuromuscular disorders. She is part of the Neuromuscular clinic at the MCH. Her research focuses on the transition of patients from pediatric to adult medical institutions.

**Chantal Poulin:** Dr Poulin is a pediatric Neurologist with a focus on Neuromuscular disorders. She is part of the Neuromuscular clinic at the MCH.

**Lisa-Anne Rasmussen:** Dr Rasmussen is a pediatric neurologist with a focus on palliative care. She is part of the Neurofibromatosis clinic at the MCH.

**Eric Shoubridge:** Dr. Eric Shoubridge’s laboratory focuses on the molecular genetics of mitochondrial diseases.

**Michael Shevell:** Dr Shevell is a pediatric Neurologist at the MCH with a focus on developmental delay and cerebral palsy. He is part of the Developmental Delay clinic at the MCH. His research focuses on neurodevelopmental disabilities.

**Myriam Srour:** Dr Srour is a pediatric Neurologist at the MCH. She heads the Neurogenetic and Brain malformation clinics at the MCH, and is part of the Developmental delay clinic at the MCH. Her research focuses on the genetic basis of Brain malformations.

□

#### **Academic Facilities** □

##### *o Outline facilities for clinical and academic pursuit* □

The Neurology clinical spaces at the MNH, MCH and MGH will be accessible and available to the fellow. The residents’ rooms at the MCH and the MNH that have access to shared computers, as well as a very complete neurology library will be available to the Fellow.

##### *o Library access, materials relevant to fellowship training*

The fellow will have access to the large library at the MNH, as well as at the MCH and the MGH. The MNH library has a large collection of neurogenetics reference books and medical journals. The McGill library has a large access to neurogenetic journals on line. The Resident's room at the MCH also has a large collection of reference materials.

*o Availability of a skills lab if applicable* □

Several physicians and researchers have neurogenetics laboratories. If the fellow chooses to be involved in a research project with a laboratory component, he or she can have access to the laboratory facilities.

### **Fellow Duties and Responsibilities**

- The fellow will be responsible to attend all McGill out-patient clinics affiliated to the program during the first 6 months of the fellowship. For the remaining 6 months period clinics will be selected by the fellow according to interests or selected research project. The total number of outpatient clinics per week will be determined in advance in consultation with the Fellowship director. This will depend on the Fellow's focus and research project. The fellow is required to inform the attending physician of his absence in advance to allow for rescheduling of patients.
- The fellow will be expected to attend the Neurogenetics rounds every 4 weeks at the MCH.
- The fellow will be encouraged to attend the Pediatric Neurology protected teaching (Neurogenetics topics), Neurology grand rounds every week and the Neuromuscular multidisciplinary rounds at the MNH every two weeks.
- The fellow will be expected to provide case-based and case-focused teaching to residents. The fellow will be expected to give formal teaching to the adult and pediatric neurology residents at their academic half day once per year.
- The fellow will be encouraged to attend one international meeting and present a poster/platform (example: American Academy of Neurology, American Society of Human Genetics, Child Neurology Society...).

Evaluation: The fellow will meet on regular basis (3/year) with one member of the Neurogenetics Fellowship committee (Drs Bernard Brais, Geneviève Bernard and Myriam Srour) to review performance, progress and go over any issues and challenges. The fellow will also meet on a regular basis with his/her specific research supervisor.

## FELLOWSHIP IN NEUROGENETICS MCGILL UNIVERSITY

**DIRECTOR :** Dr. Bernard Brais

**TEACHERS:**

Eva Andermann  
Genevieve Bernard  
Bernard Brais  
Colin Chalk  
Marie-Emmanuelle Dilenge  
Erin O'Ferrall  
Maryam Oskoui  
Chantal Poulin  
Lisa-Anne Rasmussen  
Michael Shevell  
Eric Shoubridge  
Myriam Srour

**INVITED COLLEAGUES:**

Nancy Braverman  
Isabelle DeBle  
Serge Melançon  
John Mitchell  
Laura Russell

---

**INSTITUTIONS:**

Montreal Neurological Hospital and Institute, CUSM  
Montreal Children's Hospital, CUSM  
Montreal General Hospital, CUSM

**AFFILIATED INSTITUTIONS:**

CHU Sainte-Justine  
Clinique Neuromusculaire, Centre de réadaptation Marie-Enfant, CHU-Sainte-Justine

Clinique Neuromusculaire, Centre de réadaptation Lucie-Bruneau  
Clinique Neuromusculaire, CSSS de Jonquière

---

**GOAL :** This post-graduate fellowship program aims to provide to pediatric and adult neurologists clinical training in neurogenetics.

The fellow in Neurogenetics will have privilege access to following CUSM super-specialised clinics:

- ◆ Neurogenetics clinic at the MNH (B. Brais and E. Anderamann)
- ◆ Ataxia and adult leukoencephalopathy clinic at the MNH (B. Brais and G. Bernard)
- ◆ Pediatric Movement disorders and ataxia clinic at the MCH (G. Bernard)
- ◆ Pediatric neurogenetics clinic at MCH (M. Srour)
- ◆ Developmental delay clinic at the MCH (M Shevell and M. Srour)
- ◆ Neurofibromatosis Clinic (M.-E. Dilenge, L.A. Rasmussen and J. Ortenberg)
- ◆ Brain malformations clinic MCH (M. Srour)
- ◆ Adult Neuromuscular clinic MNH (B. Brais, E. O'Ferrall)
- ◆ Pediatric Neuromuscular clinic at MCH (C. Poulin, M. Oskoui)
- ◆ Leukodystrophy and Neurometabolic clinic at MCH (G. Bernard)
- ◆ Peripheral nerve and myasthenia clinics at the MGH (C. Chalk and E. O'Ferrall)

The specific goals for the Fellowship are outline in the attached document.

In addition to the varied clinics, the fellow will have access to the following teaching rounds:

- ◆ Neurogenetics rounds every 4 weeks at the MCH
- ◆ Pediatric Neurology rounds
- ◆ Pediatric Neurology protected teaching (Neurogenetics topics)
- ◆ Neurology grand rounds every week

- ◆ Neuromuscular multidisciplinary rounds at the MNH every two weeks

It is also strongly recommended that the post-graduate fellow undertake clinical or laboratory research projects. The basics in genetic laboratory methods and techniques will be introduced such as PCR, linkage analysis, sequence analysis, SNP genotyping, homozygosity mapping and whole exome analysis.

---

**LENGTH OF FELLOWSHIP :** 1 year

**REQUIREMENTS:** Residency in Neurology (Adult or Pediatric)