BIOGRAPHICAL SKETCH

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NAME: Karine Fénelon, Ph.D

POSITION TITLE: Assistant Professor in Neuroscience

eRA COMMONS USER NAME (credential, e.g., agency login): KFENELON

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
McGill University (Montreal, CANADA)	B.Sc	1996-1999	Physiology
University of Sherbrooke (Sherbrooke, CANADA)	M.Sc	2000-2002	Physiology & Biophysics
University of Montreal (Montreal, CANADA)	Ph.D	2003-2008	Neuroscience
Columbia University Medical Center (New-York, USA)	Postdoctoral training	2008-2013	Neuroscience

A. Personal Statement

As a physiologist, I have extensive experience in electrophysiological recordings (15 years) and optogenetics (5 years) in living brain tissues acquired during my Ph.D (University of Montreal, Montreal,Canada) and my post-doctoral training (Columbia University, NY, USA). Using state-of-the-art technology, I was able to record synaptic transmission in specific neuronal pathways, by making selected brain circuits sensitive to light. These experiments were performed to better understand the pathophysiology of schizophrenia using genetics based mouse models. During my postdoctoral training at Columbia University, I had the opportunity to work with renowned mouse models of schizophrenia-related microdeletion. Using these mice, I discovered synaptic deficits as a neural substrate underlying memory dysfunction and the increased risk for psychiatric diseases (Fénelon et al., 2011 and 2013; Mukai et al., 2015; Crabtree et al., 2017). I was trained under the supervision of well established and highly qualified electrophysiologists (Dr. Amy B. MacDermott and Dr. Gerald D. Fischbach) and geneticist (Dr. Joseph A. Gogos), strongly supporting my career pathway. I was also trained in viral injections to perform *in vitro* Optogenetics in the laboratory of Dr. Joshua A. Gordon. The ultimate goal of my current research is to better understand the cellular circuits and mechanisms underlying sensorimotor gating, a neuronal phenomenon that underlie pre-attentive information processing by the central nervous system. The outcome of such research should help understanding the pathophysiological processes underlying sensorimotor gating deficits that are present in many psychiatric and neurodegenerative diseases. I hope that our proposed research will have positive repercussions nationally and internationally. Overall, I believe that I am well suited for the current grant application.

1. Mukai J, Tamura M, **Fénelon K**, Rosen AM, Spellman TJ, Kang R, MacDermott AB, Karayiorgou M, Gordon JA, Gogos JA. (**2015**) Molecular substrates of altered axonal growth and brain connectivity in a mouse model of schizophrenia. Neuron 86(3):680-695. PMID: 25913858

2. Crabtree GW, Sun Z, Kvajo M, Broek JA, **Fénelon K**, McKellar H, Xiao L, Xu B, Bahn S, O'Donnell JM, Gogos JA. (**2017**) Alteration of Neuronal Excitability and Short-Term Synaptic Plasticity in the Prefrontal Cortex of a Mouse Model of Mental Illness. Journal of Neuroscience 37(15):4158-4180. PMID: 28283561

B. Positions and Honors

Positions and Employment

1996-1999	B.Sc. Undergraduate Trainee in Physiology and Environmental Sciences, McGill University (CANADA).
2000-2002	M.Sc Candidate in Physiology and Biophysics, University of Sherbrooke (CANADA).
2003-2008	Ph.D Fellow in Neuroscience in Physiology, University of Montreal (CANADA).
2008-2013	Post-doctoral Research Scientist in Physiology and Cellular Biophysics/Neuroscience, Columbia University (USA).
Jan. 2014- present	Assistant Professor in the Biological Sciences Department, University of Texas at El Paso (USA).

Other Experience and Professional Memberships

2003-present	Member, Society for Neuroscience (SfN)
2015- present	Reviewer, Molecular Pain journal
2015- present	Reviewer, Translational Psychiatry journal

Awards and Fellowships

2003-2006	FRSQ **PhD**. **Training award** (**60,000$ CAN**) from "Fonds de la Recherche en Santé du Québec (FRSQ)", a Quebec funding agency in the field of human health research, Canada.
2003-2006	**Ph.D Departmental Bursary of Excellence** (**7,000$ CAN**) University of Montreal, Canada
2006	**First prize** of the student presentations, Departmental Retreat, University of Montreal, Canada
2006	**First prize** of the student presentations, 9th annual Chemistry and Biochemistry Graduate Research Conference (CBGRC), Canada
2007	**Best interdisciplinary presentation**, 4th Interdisciplinary Graduate Student Research Symposium (IGSRS), Canada
2012	**2nd prize** of the best poster presentation (Prize: **Apple IPod**), Columbia University Annual Physiology Retreat, USA.
2013	**STARS award**, University of Texas at El Paso **($250,000 US)**. The Faculty STARS Program can be used for purchase of equipment and renovation of facilities required as part of the recruitment or retention of particularly outstanding faculty in the health science institutions. Successful nominees will have firm institutional commitments for salary support as well as an institutional commitment for equipment and/or renovations requiring an investment of at least of $250,000 by the institution.
2014-2016	**NIH-Funded BBRC pilot grant ($25,000 US)** (**Fenelon K, PI**; Skouta R, Co-PI) Goals of the project: The proposed research was a translational collaborative effort (using a mouse model of lead (Pb) exposure, Electrophysiology/Optogenetics and chemistry) to better understand the effects of low-levels of Pb in the brain of children living in at risk communities.

C. Contribution to Science

1. During my master's thesis, my goal under the supervision of Dr. Paul C. Pape was to better understand the regulation of skeletal muscle contraction using frog cut skeletal muscle fibers, a field called excitation-contraction coupling. A necessary step in excitation-contraction coupling involves the entry of calcium ions (Ca^{2+}) into the cytoplasm which triggers contraction. Our main research focus has been on understanding the regulation of this entry. My specific project involved obtaining a better understanding of a positive feedback mechanism named Ca-induced Ca^{2+} release (CICR) in skeletal muscle, regulating Ca^{2+}entry. CICR is a mechanism not well understood in skeletal muscle though thought to be the primary mechanism in cardiac muscle and to be deficient in some muscle pathophysiologies. Therefore, a better understanding of this mechanism is crucial towards finding a treatment for these muscle pathologies.

1. Pape PC, **Fénelon K**, and Carrier N. **2002**. Extra activation component of calcium release in frog muscle fibres. Journal of Physiology 542(3): 867-886. PMCID:PMC2290450

2. **Fénelon K**, and Pape PC. **2002**. Recruitment of Ca2+ release channels by Ca2+-induced Ca2+ release does not appear to occur in isolated Ca2+ release sites in frog skeletal muscle. Journal of Physiology 544(3): 777-791. PMCID:PMC2290617

3. Pape PC, **Fénelon K**, Lamboley C RH, and Stachura D. **2007**. Role of calsequestrin from changes in free and total calcium concentrations in the sarcoplasmic reticulum of frog cut skeletal muscle fibres. Journal of Physiology 581(1): 319-367. PMCID:PMC2075213

4. **Fénelon K**, Lamboley CRH, Carrier N, and Pape PC. **2012**. Calcium buffering properties of the sarcoplasmic reticulum and calcium-induced Ca2+ release during the quasi-steady level of release in twitch fibers from frog skeletal muscle. Journal of General Physiology 140(4): 403-419. PMCID:PMC3457687

2. In wanting to better understand how muscles and the central nervous system control movements, I pursued a Ph.D at the Université de Montréal. Under the supervision of Dr. Réjean Dubuc, I studied the supraspinal control of movement. Using *in vitro* lamprey preparations, we showed that both synaptic inputs and intrinsic cellular properties (including calcium-dependent mechanisms) are crucial in brain stem neurons that play an important role in sensorimotor integration**.** My research was fundamental to better understand patient suffering from brain stem or spinal cord injuries and who can not perceive sensory information and are unable to produce the appropriate locomotor output.

1. *Antri M, ****Fénelon K**, and Dubuc R. **2009**. Synaptic modulation of sustained depolarizations in reticulospinal neurons. **(*= equal contribution).** Journal of Neuroscience. 29(4):1140-1151. PMID:19176823

2. Brocard F, Ryczko D, **Fénelon K**, Hatem R, Gonzales D, Auclair F, Dubuc R. **2010**.The transformation of a unilateral locomotor command into a symmetrical bilateral activation in the brainstem. Journal of Neuroscience 30(2): 523-533. PMID:20071515

3. During my postdoctoral training at Columbia University, I used electrophysiology and optogenetics in genetics based mouse models of schizophrenia to identify cellular intrinsic properties and synaptic deficits in the hippocampus and the medial prefrontal cortex, two brain regions implicated in schizophrenia pathogenesis. The results of my work suggest that mutations predisposing to schizophrenia and associated behavioral abnormalities affect synaptic activity in key brain circuits. My work was central to describing for the first time short-term synaptic abnormalities in these particular schizophrenia-related mouse models.

1. **Fénelon K**, Mukai J, Xu B, Hsu PK, Drew LJ, Karayiorgou M, Fischbach GD, Macdermott AB, Gogos JA. **2011**. Deficiency of Dgcr8, a gene disrupted by the 22q11.2 microdeletion, results in altered short-term plasticity in the prefrontal cortex. Proceedings of the National Academy of Sciences of the United States of America (PNAS) 108(11): 4447-4452. PMCID:PMC3060227

2. Drew LJ, Stark KL, **Fénelon K**, Karayiorgou M, Macdermott AB, Gogos JA. **2011**. Evidence for altered hippocampal function in a mouse model of the human 22q11.2 microdeletion. Molecular and Cellular Neurosciences 47(4): 293-305. PMCID:PMC3539311

3. **Fénelon K**, Xu B, Lai CS, Mukai J, Markx S, Stark KL, Hsu PK, Gan WB, Fischbach GD, MacDermott AB, Karayiorgou M, Gogos JA. **2013**. The pattern of cortical dysfunction in a mouse model of a schizophrenia-related microdeletion. Journal of Neuroscience 33(37):14825-14839. PMCID:PMC3771024

Complete List of Published Work in MyBibliography:

http://www.ncbi.nlm.nih.gov/sites/myncbi/1BKn6kmYiwfAO/bibliography/48006900/public/?sort=date&direction=ascending

D. Ongoing Research Support

1. **1SC1GM118242-01 (Fenelon K, PI)** **04/01/2016-03/31/2020**

SUPPORT OF COMPETITIVE RESEARCH (SCORE) PILOT PROJECT AWARD (SC1) Program
NIH-NIGMS/NIMH
Project title: Functional Investigation of Neural Elements Located in a Key Brainstem Circuit that Controls Attention.