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Axe Neurosciences

Centre de recherche du CHUM

900, rue Saint-Denis

Montréal, QC, H2X 0A9 Canada

Statut universitaire / University status

Professeur agrégé, Département de neurosciences, Faculté de médecine, Université de Montréal

Appartenance à d'autres groupes / Affiliation with other groups

Membre associé, Groupe de recherche sur le système nerveux central (GRSNC) du FRQS, 2007-

Membre, Centre d'excellence en neuromique de l'Université de Montréal (CENUM)

Formation / Training

B.Sc., Physiologie, Biochimie, Université d'Ottawa, Ottawa, ON, Canada, 1990-1994

Ph.D., Zoologie (Neuroscience), Université de la Colombie-Britannique, Vancouver, BC, Canada, 1995-2000

Orientations de la recherche

- La neurobiologie des cellules souches

Principaux projets en cours

- Cellules souches du cerveau : régulation pendant le vieillissement et la maladie d'Alzheimer.
- Cellules souches de l'hippocampe : régulation par l'exercice physique et stimulation cognitive.
- Cellules souches de la moelle épinière : identification, caractérisation, et réponses au traumatismes/maladies.

Research orientations

- Stem cell biology

Current research projects

- Brain neural stem cells: regulation during aging and Alzheimer's Disease
- Neural stem cells of the hippocampus: regulation by physical exercise and cognitive stimulation
- Neural stem cells of the spinal cord: identification, characterization, and responses to injury/diseases

Publications choisies / Selected publications

Grégoire, C. A., Goldenstein, B. L., Floriddia, E. M., Barnabé-Heider, F. and Fernandes, K. J. (2015). Endogenous neural stem cell responses to stroke and spinal cord injury. *Glia*, 63 (8): 1469-82.

Hamilton, L. K., Dufresne, M., Joppé, S. E., Petryszyn, S., Aumont, A., Calon, F., Barnabé-Heider, F., Furtos, A., Parent, M., Chaurand, P. and Fernandes, K. J. (2015). Aberrant Lipid Metabolism in the Forebrain Niche Suppresses Adult Neural Stem Cell Proliferation in an Animal Model of Alzheimer's Disease. *Cell Stem Cell*, 17 (4): 397-411.

Joppé, S. E., Hamilton, L. K., Cochard, L. M., Levros, L. C., Aumont, A., Barnabé-Heider, F. and Fernandes, K. J. (2015). Bone morphogenetic protein dominantly suppresses epidermal growth factor-induced proliferative expansion of adult forebrain neural precursors. *Front Neurosci*, 9: 407.

Grégoire, C. A., Bonenfant, D., Le Nguyen, A., Aumont, A. and Fernandes, K. J. (2014). Untangling the influences of voluntary running, environmental complexity, social housing and stress on adult hippocampal neurogenesis. *PLoS One*, 9 (1): e86237.

Lacroix, S., Hamilton, L. K., Vaugois, A., Beaudoin, S., Breault-Dugas, C., Pineau, I., Lévesque, S. A., Grégoire, C. A. and Fernandes, K. J. (2014). Central canal ependymal cells proliferate extensively in response to traumatic spinal cord injury but not demyelinating lesions. *PLoS One*, 9 (1): e85916.

Hamilton, L. K., Joppe, S. E., L. M. Cochard and Fernandes, K. J. (2013). Aging and neurogenesis in the adult forebrain: what we have learned and where we should go from here. *Eur J Neurosci*, 37: 1978-86.

Paliouras, G. N., Hamilton, L. K., Aumont, A., Joppe, S. E., Barnabé-Heider, F. and Fernandes, K. J. (2012). Mammalian target of rapamycin signaling is a key regulator of the transit-amplifying progenitor pool in the adult and aging forebrain. *J Neurosci*, 32: 15012-26.

Bednarczyk, M. R., Hacker, L. C., Fortin-Nunez, S., Aumont, A., Bergeron, R. and Fernandes, K. J. (2011). Distinct stages of adult hippocampal neurogenesis are regulated by running and the running environment. *Hippocampus*, 21: 1334-47.

Bouab, M., Paliouras, G. N., Aumont, A., Forest-Berard, K. and Fernandes, K. J. (2011). Aging of the subventricular zone neural stem cell niche: evidence for quiescence-associated changes between early and mid-adulthood. *Neuroscience*, 173: 135-49.

Hamilton, L. K., Aumont, A., Julien, C., Vadnais, A., Calon, F. and Fernandes, K. J. (2010). Widespread deficits in adult neurogenesis precede plaque and tangle formation in the 3xTg mouse model of Alzheimer's disease. *Eur J Neurosci*, 32: 905-20.

Bednarczyk, M. R., Aumont, A., Decary, S., Bergeron, R. and Fernandes, K. J. (2009). Prolonged voluntary wheel-running stimulates neural precursors in the hippocampus and forebrain of adult CD1 mice. *Hippocampus*, 19: 913-27.

Hamilton, L. K., Truong, M. K., Bednarczyk, M. R., Aumont, A. and Fernandes, K. J. (2009). Cellular organization of the central canal ependymal zone, a niche of latent neural stem cells in the adult mammalian spinal cord. *Neuroscience*, 164: 1044-56.