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Dr. Karl Fernandes

Correspondence language: English

Sex: Male

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Country of Citizenship: Canada

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Courier (*)

Dr Karl Fernandes

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Protected when completed

Dr. Karl Fernandes

Language Skills

Language	Read	Write	Speak	Understand
English	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes

User Profile

Disciplines Trained In: Biochemistry, Physiology

Research Disciplines: Neurosciences, Cell Biology

Areas of Research: Alzheimer's Disease, Aging Process, Neurodegenerative Diseases, Plasticity / Neuronal Regeneration, Spinal Cord Diseases

Fields of Application: Biomedical Aspects of Human Health, Pathogenesis and Treatment of Diseases

Research Specialization Keywords: exercise, Alzheimers, adult neural stem cells

Degrees

2002/8 - 2006/9	Post-doctorate, Fellowship, Developmental Biology, The Hospital for Sick Children Degree Status: Completed Supervisors: Freda Miller, David Kaplan
2000/1 - 2002/6	Post-doctorate, Fellowship, Neurobiology, Montreal Neurological Institute Degree Status: Completed Supervisors: David Kaplan, Freda Miller
1994/9 - 2000/4	Doctorate, Zoology, Zoology, University of British Columbia Degree Status: Completed Supervisors: Wolfram Tetzlaff
1990/9 - 1994/5	Bachelor's Honours, B.Sc, Mammalian Physiology, University of Ottawa Degree Status: Completed Supervisors: Tetzlaff, Wolfram

Credentials

2000/4 - 2000/1	PhD, University of British Columbia
1994/6 - 1994/1	B.Sc. (Honours), University of Ottawa

Recognitions

2022/4 - 2029/3	Canada Research Chair (Tier 1) in Brain Aging and Repair (Canadian dollar) Canada Research Chairs Prize / Award
2015/12 - 2015/12	Discovery of the Year - 1,000 (Canadian dollar) Research Center of the University of Montreal Hospital Prize / Award
2015/9	Personality of the Week La Presse newspaper Honor
2011/10 - 2016/9	Renewal-Canada Research Chair Université de Montréal Prize / Award
2008/6 - 2010/5	Alzheimer Society Young Investigator Award Alzheimer Society of Canada Prize / Award
2007/1 - 2012/12	Canadian Foundation for Innovation-Leaders Canadian Foundation for Innovation Prize / Award
2006/11 - 2011/10	Canada Research Chair (Tier 2) in Stem Cell Neurobiology Université de Montréal Prize / Award

Employment

2020/9	Professeur titulaire Medicine, Medicine et des sciences de la santé, Université de Sherbrooke
2020/9	Associate researcher Neurosciences, Medicine, Centre hospitalier de l'Université de Montréal
2016/1	Editorial Board Stem Cell Reviews and Reports
2019/6 - 2020/9	Full Professor Neurosciences, Medicine, Université de Montréal
2012/6 - 2019/6	Associate Professor Neurosciences, Medicine, Université de Montréal
2006/10 - 2019/6	Assistant Professor Pathologie et biologie cellulaire, Medicine, Université de Montréal
2009/1 - 2014/9	Invited reviewer: Foreign countries (Welcome Trust, U.K.; Wings for Life Foundation, Austria; Croatian Science Foundation, Croatia) Foreign (governments and private foundations)
2009/1 - 2014/9	Invited reviewer: Governmental agencies (Canada Research Chairs, CA; CIHR, CA; NSERC, CA; Ontario Genomics Institute, ON; Michael Smith Foundation, BC) Governmental agencies
2009/1 - 2014/9	Ad hoc reviewer: Scientific journals (Cell Stem Cell; J Neurosci; Eur J Neurosci; Cell Death Diff; Hippocampus, BMC Cell Biology; PLOS; FEBS; Neuroscience; others) Scientific journals

2013/1 - 2013/6	Invited committee member: CIHR peer review panel (Biological and Clinical Aspects of Aging) Canadian Institutes of Health Research
2012/1 - 2012/6	Invited committee member: CIHR peer review panel (Biological and Clinical Aspects of Aging) Canadian Institutes of Health Research
2002/8 - 2006/9	Post-doctoral fellow Stem cells and developmental biology, Medicine, The Hospital for Sick Children
2002/8 - 2006/9	Post-doctoral Fellow The Hospital for Sick Children
2000/1 - 2002/7	Post-doctoral fellow Neuroscience, Medicine, Montreal Neurological Institute
2000/1 - 2002/6	Post-doctoral Fellow Montreal Neurological Institute
1995/9 - 2000/1	Ph.D. student Zoology, Science, University of British Columbia
1993/9 - 1994/6	B.Sc. (Honours) student Physiology, Medicine, University of Ottawa
1990/9 - 1993/6	B.Sc. student Biochemistry, Science, University of Ottawa

Affiliations

The primary affiliation is denoted by (*)

2020/9	Affiliated Professor, Neurosciences, Université de Montréal
(*) 2020/9	Full Professor, Medicine, Université de Sherbrooke

Research Funding History

Awarded [n=7]

2022/4 - 2029/3 Principal Applicant	Tier 1 Canada Research Chair in Brain Aging and Repair Funding Sources: 2022/4 - 2029/3 Canada Research Chairs (CRC) Total Funding - 1,400,000 (Canadian dollar) Funding Competitive?: Yes
2022/4 - 2027/3 Co-applicant	Imaging the contribution of early cerebrovascular inflammation in Alzheimer's disease Co-applicant : Brigitte Guérin; Karl Fernandes; Mélanie Plourde; Tamas Fulop; Principal Applicant : Martin Lepage Funding Sources: 2022/4 - 2027/3 Canadian Institutes of Health Research (CIHR) Project Total Funding - 1,002,150 (Canadian dollar) Funding Competitive?: Yes
2022/4 - 2027/3 Principal Applicant	Exploiting brain-body crosstalk to correct brain lipid metabolism in Alzheimer's disease

Funding Sources:

2022/4 - 2027/3 Canadian Institutes of Health Research (CIHR)
Project
Total Funding - 952,425 (Canadian dollar)
Funding Competitive?: Yes

2022/4 - 2027/3
Principal Applicant

Mechanisms of experience-dependent hippocampal neurogenesis

Funding Sources:

2022/4 - 2027/3 Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery grants
Total Funding - 170,000 (Canadian dollar)
Funding Competitive?: Yes

2018/4 - 2023/3
Principal Applicant

Genetic targeting of quiescent adult neural stem cells

Funding Sources:

2018/4 - 2023/3 Canadian Institutes of Health Research (CIHR)
Project grants
Total Funding - 952,425 (Canadian dollar)
Funding Competitive?: Yes

2021/10 - 2022/9
Principal Applicant

A new therapeutic target for correcting brain lipid metabolism in Alzheimer's disease

Collaborator : Pierre Chaurand

Funding Sources:

2021/10 - 2022/9 Alzheimer Society of Canada
Proof of concept, discovery
Total Funding - 100,000 (Canadian dollar)
Funding Competitive?: Yes

2016/4 - 2022/3
Principal Applicant

Mechanisms of experience-dependent hippocampal neurogenesis

Funding Sources:

2016/4 - 2021/3 Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery
Total Funding - 360,000 (Canadian dollar)
Funding Competitive?: Yes

Completed [n=1]

2016/7 - 2021/6
Principal Applicant

Correction of brain triglyceride metabolism in Alzheimer's disease

Co-applicant : Laura Hamilton; Pierre Chaurand; Stephanie Fulton; Thierry Alquier

Funding Sources:

2016/7 - 2021/6 Canadian Institutes of Health Research (CIHR)
Project
Total Funding - 856,240 (Canadian dollar)
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Bachelor's [n=8]

Principal Supervisor	Myriam Aubin (Completed) , Université de Sherbrooke Student Degree Start Date: 2017/9 Student Degree Received Date: 2021/5 Present Position: MSc
Principal Supervisor	Farah Boubenider (Completed) , Université de Montréal Student Degree Start Date: 2017/5 Present Position: Completed
Principal Supervisor	Paule Enora Mbra (Completed) , Université de Montréal Student Degree Start Date: 2016/9 Present Position: PhD
Principal Supervisor	Alexandra Mondor-Leduc (Completed) , Université de Montréal Student Degree Start Date: 2015/9 Present Position: Veterinary school
Principal Supervisor	Andréanne Leclerc (Completed) , Université de Montréal Student Degree Start Date: 2015/5 Present Position: student
Principal Supervisor	Matthieu Dupuis (Completed) , Université de Montréal Student Degree Start Date: 2014/9 Present Position: Completed
Principal Supervisor	Nita Avrith (Completed) , McGill University Student Degree Start Date: 2011/5 Project Description: Neurogenesis in Alzheimer's Present Position: medicine
Principal Supervisor	Lindsay Hacker (Completed) , Concordia University Student Degree Start Date: 2009/5 Project Description: Running-induced neurogenesis Present Position: other

Bachelor's Honours [n=9]

Principal Supervisor	Marc-Antoine Charron (Completed) , Université de Montréal Student Degree Start Date: 2015/5 Present Position: student
Principal Supervisor	David Bonenfant (Completed) , Université de Montréal Student Degree Start Date: 2012/5 Project Description: Environmental enrichment regulation of adult neurogenesis Present Position: other
Principal Supervisor	Carl Tamas (Completed) , Université de Montréal Student Degree Start Date: 2012/5 Project Description: Lipid regulation of neurogenesis Present Position: Dentistry

Principal Supervisor	Adalie Le Nguyen (Completed) , Université de Montréal Student Degree Start Date: 2011/5 Project Description: Running-induced neurogenesis Present Position: other
Principal Supervisor	Stéphanie Fortin-Nunez (Completed) , Université de Montréal Student Degree Start Date: 2009/9 Project Description: Running-induced neurogenesis Present Position: other
Principal Supervisor	Alexandra Vadnais (Completed) , Université de Montréal Student Degree Start Date: 2009/9 Project Description: Neurogenesis in Alzheimer's Present Position: other
Principal Supervisor	Karl Forest-Bérard (Completed) , Université de Montréal Student Degree Start Date: 2009/5 Project Description: Neurogenesis during aging Present Position: other
Principal Supervisor	Christian Breault-Dugas (Completed) , Université de Montréal Student Degree Start Date: 2009/5 Project Description: Injury-induced proliferation in the spinal cord Present Position: other
Principal Supervisor	Vinh Truong (Completed) , Université de Montréal Student Degree Start Date: 2008/1 Project Description: Spinal cord stem cells Present Position: other

Master's Thesis [n=7]

Principal Supervisor	Paule Enora Mbra (Completed) , Université de Montréal Student Degree Start Date: 2020/1 Present Position: PhD
Principal Supervisor	Chenicka Lyn Mangahas (Completed) , Université de Montréal Student Degree Start Date: 2019/1 Present Position: Completed
Principal Supervisor	Pierre Ameslon (Completed) , Université Aix-Marseilles Student Degree Start Date: 2017/3 Present Position: unknown
Principal Supervisor	Vaugois Alexandre (Completed) , Université de Montréal Student Degree Start Date: 2011/9 Project Description: Molecular regulation of spinal cord stem cells Present Position: Environmental engineering
Principal Supervisor	Stefanny Beaudoin, (Withdrawn) , Université de Montréal Student Degree Start Date: 2010/1 Project Description: Spinal cord stem cells during spinal cord disease Present Position: other
Principal Supervisor	Bednarczyk Matthew (Bursary: Department) (Completed) , Université de Montréal Student Degree Start Date: 2008/9 Student Degree Received Date: 2010/5 Project Description: The function and mechanisms of regulation of hippocampal neurogenesis Present Position: doctorate, Lethbridge University

Principal Supervisor Meriem Bouab (Completed) , Université de Montréal
 Student Degree Start Date: 2007/9
 Student Degree Received Date: 2010/5
 Project Description: Aging of the forebrain subventricular zone stem cell niche
 Present Position: other

Doctorate [n=6]

Principal Supervisor Paule Enora Mbra (In Progress) , Université de Montréal
 Student Degree Start Date: 2021/5
 Present Position: in progress

Principal Supervisor Federico Pratesi (In Progress) , Université de Montréal
 Student Degree Start Date: 2019/1
 Present Position: PhD

Principal Supervisor Loic Cochard (Bursary: Department) (Completed) , Université de Montréal
 Student Degree Start Date: 2014/5
 Student Degree Received Date: 2021/4
 Project Description: Stem cell aging
 Present Position: PhD student

Principal Supervisor Joppe Sandra (Bursary: Dept and Graduate Studies) (Completed) , Université de Montréal
 Student Degree Start Date: 2014/1
 Student Degree Received Date: 2018/4
 Project Description: Signaling pathway integration in adult neural stem cells
 Present Position: PhD student

Principal Supervisor Gregoire Catherine (Completed) , Université de Montréal
 Student Degree Start Date: 2010/5
 Student Degree Received Date: 2016/6
 Project Description: Activity-dependent regulation of adult hippocampal neurogenesis
 Present Position: Post-doctoral student

Principal Supervisor Laura Hamilton (Bursary: Alzheimer Society & FRSQ) (Completed) , Université de Montréal
 Student Degree Start Date: 2009/1
 Student Degree Received Date: 2015/4
 Project Description: Regulation of CNS stem cells during Alzheimer's Disease
 Present Position: Post-doc

Post-doctorate [n=5]

Principal Supervisor Laura Hamilton (Fellowship: Alzheimer Society) (In Progress) , CRCHUM
 Student Degree Start Date: 2015/7
 Present Position: Post-doc

Principal Supervisor Brianna Goldenstein (Completed) , Université de Montréal
 Student Degree Start Date: 2014/8
 Present Position: postdoctoral fellow

Principal Supervisor Louis-Charles Levros (partial fellowship) (Completed) , Université de Montréal
 Student Degree Start Date: 2013/1
 Present Position: postdoctoral fellow

Co-Supervisor Aurelie Stil (Completed) , Université de Montréal
 Student Degree Start Date: 2012/9
 Project Description: Notch regulation of neurogenesis following spinal cord injury
 Present Position: Postdoctoral student

Principal Supervisor Grigorios Paliouras (Fellowship: GRSNC) (Completed) , Université de Montréal
 Student Degree Start Date: 2009/11
 Student Degree Received Date: 2011/10
 Project Description: Signalling in aging neural stem cells
 Present Position: PDF

Mentoring Activities

2006/10 Advisory Committees, Université de Montréal
 Number of Mentorees: 20
 Graduate student thesis committees

2006/10 External thesis examiner, Université de Montréal
 Number of Mentorees: 10
 PhD and MSc thesis examiner for other institutions

2006/10 MSc theses: reviewer, Université de Montréal
 Number of Mentorees: 9
 Master's thesis reviewer (U.deM.)

2006/10 PhD theses: reviewer, Université de Montréal
 Number of Mentorees: 7
 PhD thesis reviewer (at U.deM.)

2006/10 Pre-doctoral Examiner, Université de Montréal
 Number of Mentorees: 11
 Examiner at Predoctoral Exam

Knowledge and Technology Translation

2017/5 - 2017/5 Guest speaker, Community Engagement
 Target Stakeholder: General Public
 Outcome / Deliverable: Question and Answer Panel at the UAlberta MS Centre Research Symposium, 2017
 Activity Description: I was a guest speaker at the Edmonton MS Symposium for patients, scientists, and clinicians, giving a presentation and participating in a panel discussion for the public.

International Collaboration Activities

2012/1 Collaborator, Sweden
 Collaboration with Dr Fanie Barnabé-Heider (Karolinska Institute, Sweden) on multiple joint research projects. Joint publications include: Paliouras et al., J Neurosci, 2012
 Gregoire et al., Glia, 2015 Hamilton et al., Cell Stem Cell, 2015 Joppé et al., Front Neurosci, 2015 (additional in preparation)

Presentations

1. (2022). Recruiting quiescent neural stem cells in the injured spinal cord. Canadian Association for Neuroscience, Toronto, Canada
 Main Audience: Researcher
 Invited?: Yes

2. (2022). Brain fatty acid metabolism as a mediator of cellular and behavioral impairments in Alzheimer's disease. Alzheimer's Association International Conference, San Diego, United States
Main Audience: Researcher
Invited?: Yes
3. (2022). Brain fatty acid metabolism as a mediator of cellular and behavioral impairments in Alzheimer's disease. International Conference on the Bioscience of Lipids, Montreal, Canada
Main Audience: Researcher
Invited?: Yes
4. (2022). Lipids and the pathogenesis of Alzheimer's disease. Department of Biology, Sherbrooke, Canada
Main Audience: Researcher
5. (2021). Correction of aberrant brain fatty acid metabolism in Alzheimer's disease. Cell and experimental biology 2021, United States
Main Audience: Researcher
Invited?: Yes
6. (2021). Brain lipid metabolism as a therapeutic target in Alzheimer's disease. Institut de Gériatrie - Seminar series, Sherbrooke, Canada
Main Audience: Researcher
Invited?: Yes
7. (2020). Brain lipid metabolism as a therapeutic target in Alzheimer's disease. Centre for Advanced Research in Sleep Medicine: Seminar series, Montreal, Canada
Main Audience: Researcher
Invited?: Yes
8. (2019). Brain lipid metabolism and the pathogenesis of Alzheimer's disease. Seminar series, Kingston, Canada
Main Audience: Researcher
Invited?: Yes
9. (2019). New insights into the pathogenesis of Alzheimer's disease. Recruitment seminar, Sherbrooke, Canada
Main Audience: Researcher
Invited?: Yes
10. (2019). Stem cells, lipids and the pathogenesis of Alzheimer's disease. Recruitment seminar, Sherbrooke, Canada
Main Audience: Researcher
Invited?: Yes
11. (2018). Biological properties of dormant neural stem cells revealed by genetic targeting in the adult murine brain. Canadian Association for Neuroscience, Satellite Symposium: Neural stem cells in development and adulthood, Canada
Main Audience: Researcher
Invited?: Yes
12. (2017). Identification and correction of brain fatty acid abnormalities in Alzheimer's disease. Biogen seminar, Boston, United States
Main Audience: Researcher
Invited?: Yes
13. (2017). Lipid metabolism in adult neural stem cell biology and AD. Annual Meeting of the American Society for Neurochemistry, Little Rock, United States
Main Audience: Researcher
Invited?: Yes

14. (2017). Neural stem cell dysregulation by aberrant brain fatty acid metabolism in Alzheimer's disease. Till and McCulloch Symposium, Mont Tremblant, Canada
Main Audience: Researcher
Invited?: Yes
15. (2017). Mechanisms and consequences of lipid metabolism disturbances in Alzheimer's disease. EMBO Annaberg Workshop, Annaberg, Austria
Main Audience: Researcher
Invited?: Yes
16. (2017). Identification and correction of brain fatty acid abnormalities in Alzheimer's disease. Lipids and Brain Symposium, Nancy, France
Main Audience: Researcher
Invited?: Yes
17. (2017). Waking dormant stem cells in the diseased brain. NMHI Seminar Series, Edmonton, Canada
Main Audience: Researcher
Invited?: Yes
18. (2017). Lipid metabolism in adult neural stem cell biology and Alzheimer's disease. AD/PD Meeting, Vienna, Austria
Main Audience: Researcher
Invited?: Yes
19. (2017). Recruiting dormant stem cells in the diseased brain. UAlberta MS Centre Research Symposium, Edmonton, Canada
Main Audience: Researcher
Invited?: Yes

Publications

Journal Articles

1. *Hamilton LK, Moquin-Beaudry G, *Mangahas CL, *Pratesi F, *Aubin M, *Aumont A, *Joppe SE, Légiot A, Vachon A, Plourde M, Mounier C, Tétreault M, Fernandes KJL. (2022). Stearoyl-CoA Desaturase inhibition reverses immune, synaptic and cognitive impairments in an Alzheimer's disease mouse model. *Nature Communications*. 13(1): 2061.
Published
Refereed?: Yes
2. *Catherine-Alexandra Grégoire, Olivier Tastet, *Louis-Charles Levros, *Brianna L. Goldenstein, *Sandra E. Joppé, *Anne Aumont, Steve Lacroix, Karl J. L. Fernandes. (2022). Transcriptomic profiling reveals novel endogenous regulators of ependymal cell responses in the injured spinal cord. *NA*. TBD: TBD.
Submitted
Refereed?: Yes
3. *Cochard, LM, *Levros L-C, *Joppe SE, *Pratesi F, *Aumont A, Fernandes KJLF. (2021). Manipulation of EGFR-induced signaling for the recruitment of quiescent neural stem cells in the adult mouse forebrain. *Frontiers in Neuroscience*. 15: 621076.
Published
Refereed?: Yes
4. *Pratesi F, *Hamilton LK, Fernandes KJL. (2021). Fast and gentle dissociation protocol for single cell RNA sequencing on the adult mouse brain. Submitted. *NA*: NA.
Submitted
Refereed?: Yes

5. Syal C, Kosaraju J, *Hamilton LK, *Aumont A, Chu A, Sarma SN, Thomas J, Seegobin M, Dilworth FJ, He L, Wondisford FE, Zimmermann R, Parent M, Fernandes KJL, Wang J. (2020). Dysregulated expression of monoglycerol lipase is a marker for anti-diabetic drug metformin-targeted therapy to correct impaired neurogenesis and spatial memory in Alzheimer's disease. *Theranostics*. 10(14): 6337-6360.
Published
Refereed?: Yes
6. *Joppe SE, *Cochard LM, *Levros L-C Jr, *Hamilton LK, *Ameslon P, *Aumont A, Fernandes KJL. (2020). Genetic targeting of neurogenic precursors in the adult forebrain ventricular epithelium. *Life Sci Alliance*. 3(7): e202000743.
Published
Refereed?: Yes
7. Li X, Floriddia EM, Toskas K, Chalfouh C, Honore A, *Aumont A, Vallières N, Lacroix S, Fernandes KJL, Guérout N, Barnabé-Heider F. (2018). FoxJ1 regulates spinal cord development and is required for the maintenance of spinal cord stem cell potential. *Exp Cell Res*. 368(1): 84-100.
Co-Author
Published
Refereed?: Yes
8. *Laura K Hamilton, Karl J L Fernandes. (2018). Neural stem cells and adult brain fatty acid metabolism: lessons from the 3xTg model of Alzheimer's disease. *Biology of the Cell*. 110(1): 6-25.
Published
Refereed?: Yes
9. Flamier A, El Hajjar J, Adjaye J, Fernandes KJ, Abdouh M, Bernier G. (2018). Modeling Late-Onset Sporadic Alzheimer's Disease through BMI1 Deficiency. *Cell Rep*. 23(9): 2653-2666.
Published
Refereed?: Yes

Book Chapters

1. Laura K. Hamilton Karl J. L. Fernandes. (2017). Fate through fat: lipids as regulators of neural stem cell behaviour. *Lipidomics of Stem Cells*.
Last Author
Published, Springer
Refereed?: Yes

Intellectual Property

Patents

1. Multipotent stem cells from peripheral tissues and uses thereof. United States. 2008/04/18.
Patent Status: Granted/Issued
2. Methods of Making and Using Skin-Derived Stem Cells. United States. 2005/01/27.
Patent Status: Granted/Issued
3. Cellular composition for use in the treatment and repair of bone and nervous system disorders. United States. 2001/11/09.
Patent Status: Granted/Issued