BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Jocelyn A. McDonald	Associate Professor
eRA COMMONS USER NAME joceylnmcconald	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Marquette University, Milwaukee WI	B.S.	1993	Biochemistry/Mol. Biol.
University of Illinois, Urbana-Champaign IL	Ph.D.	1998	Dev. Neurobiology
Johns Hopkins School of Medicine, Baltimore MD	Postdoctoral	1999-2004	Developmental Biology

A. Positions and Honors:

Positions and Employment

2004-2008 Project Scientist (Principal Investigator), Department of Molecular Genetics, Lerner Research Institute, Cleveland Clinic Foundation, Cleveland, OH
2007-2015 Assistant Professor of Molecular Medicine (Academic Appointment), Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, Cleveland, OH
2008-2015 Assistant Staff (Assistant Professor Equivalent, Primary Appointment), Department of Molecular Genetics, Lerner Research Institute, Cleveland Clinic Foundation, Cleveland, OH
2009-2015 Assistant Professor (Secondary Appointment), Department of Genetics and Genome Sciences, School of Medicine, Case Western Reserve University, Cleveland, OH
2011-2015 Adjunct Faculty and Member of the Graduate College, Department of Biological, Geological, and Environmental Studies, Cleveland State University, Cleveland, OH
2015- Affiliate, Johnson Center Research Center, Kansas State University, Manhattan, KS
2015- Member, Interdepartmental Genetics Program, Kansas State University, Manhattan, KS
2015-2019 Assistant Professor, Division of Biology, Kansas State University, Manhattan, KS
2019- Associate Professor, Division of Biology, Kansas State University, Manhattan, KS

Professional Memberships and Other Experience

1996- Member, American Association for the Advancement of Science
2000- Member, The Genetics Society of America
2001- Member, Society for Developmental Biology
2006- Member, American Society for Cell Biology
2017- Member, Sigma Xi
2006 Ad Hoc Grant Reviewer, Russian Cancer Research Center grants
2008-2009 American Heart Association, Basic Cell & Molecular Biology Peer Review Committee (Ad Hoc Member)
2008- Manuscript Reviewer for Genetics and Developmental Biology journals: *PLoS Biology, The Journal of Cell Biology, Developmental Biology* – (2)*, BMC Developmental Biology, G3: Genes/Genomes/Genetics* – (6)*, Molecular Biology of the Cell – (2), Journal of Visualized Experiments (JoVE), Mechanisms of Development* – (3), *Genetics, International Journal of Biological Sciences, Integrative & Comparative Biology, MethodsX, Development*, *Trends in Genetics, eLife* – (3), *Cell Reports*, *Nature Communications*, *Translational Oncology, Seminars in Cell & Developmental Biology, PLOS One, PLOS Genetics, BioEssays*
2014- Member, F1000Prime ("Faculty of 1000") Cell Adhesion & Migration Section
2014- Advisory Board Member, F1000Research
2016, 2021 Ad Hoc Grant Reviewer, National Science Foundation
2016, 2018 Ad Hoc Grant Reviewer, Medical Research Council, United Kingdom
2017 Ad Hoc Grant Reviewer, Wellcome Trust Investigator Award, United Kingdom
2017 Member, Preliminary Proposal Review Panel, National Science Foundation

2017, 2021 Member, Full Proposal Review Panel, National Science Foundation
2021 Ad Hoc Grant Reviewer, NSERC, Canada
2016-2019 Editorial board member for the journals *Cells & Development* (formerly *Mechanisms of Development*) and *Gene Expression Patterns*

Honors and Awards

1989-1993 Marquette University Academic Scholarship.
1992-1993 Howard Hughes Medical Institute Undergraduate Research Program, Marquette University
1993 Honors Certificate, Marquette University Honors Program
1995 Graduate College Conference Travel Grant, University of Illinois, Urbana-Champaign
1996 Thomas E. Beutow Conference Travel Grant, Carle Development Corporation, Urbana, IL
2000-2003 National Institutes of Health (NIGMS) Ruth L. Kirchstein NRSA Postdoctoral Fellowship Award, F32 GM020539
2012 Guest on Sound of Ideas (WCPN Cleveland Ideastream Public Radio), hosted by Mike McIntyre: "Science on the Fly" Science Café Edition (air date 2/13/2012)

B. Peer-Reviewed Publications

Original Research:

1. **McDonald, J.A.** and C.Q. Doe (1997). Establishing neuroblast-specific gene expression in the *Drosophila* CNS: *huckebein* is activated by Wingless and Hedgehog and repressed by Engrailed and Gooseberry. *Development* 124: 1079-1087. PMID: 9056782.
2. **McDonald, J.A.,** S. Holbrook, T. Isshiki, J. Weiss, C.Q. Doe and D. Mellerick (1998). Dorsoventral patterning in the *Drosophila* central nervous system: The *vnd* homeobox gene specifies ventral column identity. *Genes & Development* 12: 3603-3612. PMCID: PMC317246.
3. **McDonald, J.A.,** M. Fujioka, J. Odden, J.B. Jaynes and C.Q. Doe (2003). Specification of motoneuron fate in *Drosophila*: Integration of positive and negative transcription factor inputs by a minimal *eve* enhancer. *Journal of Neurobiology* 57: 193-203. PMID: 14556285.
4. **McDonald, J.A.*,** E.M. Pinheiro* and D.J. Montell (2003). PVF1, a PDGF/VEGF homolog, is sufficient to guide the border cells and genetically interacts with Taiman. *Development* 130: 3469-3478. PMID: 12810594.
   **These authors made equal contributions to this work.*
5. **McDonald, J.A.** and D.J. Montell (2005). Analysis of cell migration using *Drosophila* as a model system. *Methods in Molecular Biology* 294: 175-202. PMID: 15576913.
6. **McDonald, J.A.*, †,** E. Pinheiro*, L. Kadlec, T. Schupbach, and D.J. Montell† (2006). Multiple EGFR ligands participate in guiding migrating border cells. *Developmental Biology* 296: 94-106. PMID: 16712835.
   **These authors made equal contributions to this work; †Corresponding authors.*
7. **McDonald, J.A.†,** A. Khodyakova, G. Aranjuez, C. Dudley, and D.J. Montell† (2008). The Par-1 serine/threonine kinase regulates epithelial detachment and directional protrusion of migrating border cells. *Current Biology* 18: 1659-1667. PMCID: PMC2593744.
   †Corresponding authors.
   - *Featured in Nature Cell Migration Gateway* December 2008: "*Epithelial cell detachment: Up to PAR"*.
8. Majumder, P., G. Aranjuez, J. Amick, and **J.A. McDonald** (2012). Par-1 controls Myosin-II activity through myosin phosphatase to regulate border cell migration. *Current Biology* 22: 363-372. PMCID: PMC3298626.
   - *Featured by: Nature Cell Biology* May 2012: *"Cells polarize contractility to move together"* **14**: 455.
9. Aranjuez, G., E. Kudlaty, M.S. Longworth and **J.A. McDonald** (2012). On the role of PDZ domain-encoding genes in Drosophila border cell migration. *G3: Genes/Genomes/Genetics* 2: 1379-1391. PMCID: PMC3484668.
   - *Cover of issue.*
10. Geisbrecht, E.R.†, K. Sawant, Y. Su, Z.C. Liu, D. Silver, A. Burtscher, X. Wang, A.J. Zhu and **J.A. McDonald†** (2013). Genetic interaction screens identify a role for Hedgehog signaling in Drosophila border cell migration. *Developmental Dynamics*: 242: 414-431. 2013. PMCID: PMC3721345.
    †Corresponding authors.

11. Dickerman, B.K., **J.A. McDonald** and G.C. Sen (2013). The human dsRNA binding protein PACT is unable to functionally substitute for the Drosophila dsRNA binding protein R2D2. *F1000Research* 2. PMCID: PMC3962003.
12. L. Klebanow, E. Peshel, A.T. Schuster, K. De, K. Sarvepalli, M. Lemieux, J. Lenoir, A. Moore, **J.A. McDonald** and M.S. Longworth (2016). Drosophila Condensin II subunit, regulates cell fate determination in a non-cell autonomous manner. *Development*, 143: 2791-2802. 2016. doi: 10.1242/dev.133686. PMCID: PMC5004906.
13. G. Aranjuez, A. Burtscher, K. Sawant, P. Majumder***** and **J.A. McDonald*** (2016). Dynamic myosin activation promotes collective morphology and migration by locally balancing oppositional forces from surrounding tissue. *Molecular Biology of the Cell*, First Published on April 27, 2016; doi:10.1091/mbc.E15-10-0744. PMCID: PMC4907723.

    **Corresponding authors.*

    - *Recommended by F1000Prime (Faculty of 1000).*
14. X. Qin, E. Hannezo, T. Mangeat, C. Liu, P. Majumder, J. Liu, V. Cadamuro, **J.A. McDonald**, Y. Liu, B. Yi and X. Wang (2018). A biochemical network controlling basal myosin oscillation. ***Nature Communications*** 9: 1210. doi:10.1038/s41467-018-03574-5. PMCID: PMC5865161.
15. K. Sawant[§, ‡], Y. Chen[§], N. Kotian[§, ‡], K. Preuss, and **J.A. McDonald*** (2018). Rap1 GTPase promotes coordinated collective cell migration *in vivo*. ***Molecular Biology of the Cell***, 29: 2603-2799. doi:10.1091/mbc.E17-12-0752. PMCID: PMC6249841.
16. J. Volovetz[§], A.D. Berezovsky[§], T. Alban[§], Y. Chen, A. Lauko, G. Aranjuez, A. Burtscher, K. Shibuya, D. Silver, J. Peterson, D. Manor, **J.A. McDonald*** and J.D. Lathia* (2020). Identifying conserved molecular targets required for collective cell migration of glioblastoma cancer stem cells. ***Cell, Death & Disease***, 11(2):152. doi: 10.1038/s41419-020-2342-2. PMCID: PMC7044427

    [§]Equal contribution; *Co-corresponding authors.
17. Y. Chen, N. Kotian, G. Aranjuez, L. Chen, C.L. Messer, A. Burtscher, K. Sawant, D. Ramel, X. Wang, and **J.A. McDonald** (2020). Protein Phosphatase 1 activity controls a balance between collective and single cell modes of migration. ***eLife***. 9: e52979. doi: 10.7554/eLife.52979. PMCID: PMC7200163.

Reviews and Book Chapters:

1. **McDonald, J.A.** and D.J. Montell (2005). On the border of understanding cell migration. In ***Cell Migration in Development and Disease*** (ed. D. Wedlich), Wiley-VCH Publications, Weinheim, Germany, pp. 123-138.
2. **J.A. McDonald** (2014). Canonical and non-canonical roles for Par-1/MARK kinases in cell migration. ***International Review of Cell & Molecular Biology*** (ed. K. Jeon), 312:169-199. PMID: 25262242.
3. M.T. Veeman* and **J.A. McDonald*** (2016). Dynamics of cell polarity in tissue morphogenesis: a comparative view from Drosophila and Ciona. ***F1000Research***, 02 Jun 2016, 5 (F1000 Faculty Rev):1084 (doi:10.12688/f1000research.8011.1).

   *Corresponding authors.
4. **J.A. McDonald** and Y. Tomoyasu (2020). Extracellular matrix: Sculpting new structures. ***eLife*** 9: e57668. doi: 10.7554/eLife.57668. PMCID: PMC7255797.

C. Research Support

Current Research Support

2027617 Jocelyn A. McDonald (PI), Bradley Olson (Co-PI) 09/01/2020 – 08/31/2024
NSF/IOS
Title: RoL: Coordination of collective cell migration in complex tissues

The major goals of this project are to probe how groups of cells come together, adapt their shapes, and move as one within a whole tissue. Specifically, this grant will address how the small GTPase Rap1 controls specific aspects of border cell migration, how nuclei deform and the function this plays in collective border cell migration, and identify which genes change during migration so that border cells can effectively move through the tissue.

Role: PI

1738757 Jocelyn A. McDonald (PI) 09/01/17 – 08/31/19 (no-cost 08/31/21)

NSF/OIA
Title: RII Track-4: Dynamic live imaging and manipulation of migrating collectives inside tissues

The major goals of this project are to visit the host site (University of California, Santa Barbara; Denise Montell Lab) to learn new and existing live imaging and optogenetic techniques to image border cells in their native environment.

Role: PI

Research Support Completed During the Last Three Years

1456053 Jocelyn A. McDonald (PI) 09/01/15 – 08/31/18 (no-cost 08/31/20)
NSF/IOS
Title: Phosphatase control of collective cell migration during development

The major goals of this project were to identify the cellular and molecular mechanisms by which PP1 complexes, and PP1 substrates, control cell cohesion and migration of a collective during development.

Role: PI

1R21CA198254-02 (multi-PI grant) 07/01/15 – 6/30/17
NIH/NCI
Principal Investigator: Justin D. Lathia
Principal Investigator: Jocelyn A. McDonald
Title: Consequence of collective cell invasion in glioblastoma

The major goals of this project were to identify new regulators and mechanisms of collective cell invasion in glioblastoma. We will use the *Drosophila* border cell model to identify the genes and then test them in patient-derived glioblastoma stem cells both *in vitro* and *in vivo*.

Role: PI (multi-PI)