

Ryan J. Petrie

Assistant Professor

Department of Biology, Drexel University
3245 Chestnut Street, PISB 419
Philadelphia, PA 19104

rjp336@drexel.edu
Office: 215-895-1476
Lab: 215-895-2626
Cell: 240-898-7117

EDUCATION AND WORK EXPERIENCE

- 2015-Present Assistant Professor. Department of Biology, Drexel University, Philadelphia, PA.
- 2008-2015 Research Fellow. Laboratory of Cell and Developmental Biology; Dr. Kenneth M. Yamada, Chief. National Institute of Dental and Craniofacial Research (NIDCR), NIH, Bethesda, MD.
- 2002-2008 PhD, Anatomy and Cell Biology, Dr. Nathalie Lamarche-Vane, McGill University, Montreal, Quebec, Canada. Thesis: Cellular organization of the netrin receptor DCC and its associated signaling pathways.
- 1999-2002 MSc, Medical Science, Dr. Julie Deans, University of Calgary, Calgary, Alberta, Canada. Thesis: Membrane dynamics of CD20 and the BCR.
- 1992-1997 BSc, Biochemistry, University of Victoria, Victoria, British Columbia, Canada.

AWARDS AND SCHOLARSHIPS

- 2018 Drexel Career Development Award: Philly Motility
- 2016, 2018 Drexel International Travel Award
- 2014 NIH-Japan Society for the Promotion of Science Symposium
Certificate of Excellence
- 2012 American Society for Cell Biology Postdoctoral Travel Award
- 2012 American Society for Matrix Biology Travel Award
- 2010 Fellows Award for Research Excellence, NIH
- 2004-2007 Fonds de la recherche en sante Doctoral Research Award
- 2004 McGill Graduate Studies Fellowship
- 2003 Cold Spring Harbor Laboratory Tuition Award
- 2001 American Society for Cell Biology Predoctoral Travel Award
- 2000-2001 Graduate Research Scholarship
- 2000 Jacques Loeb Founders Scholarship
- 2000 Frank R. Lillie Scholarship
- 2000 Arthritis Chair Scholarship

PUBLICATIONS (*Corresponding or **co-corresponding author)

Chengappa, P, Sao, K, Jones, TM, and ***Petrie, RJ**. 2017. Intracellular pressure: a driver of cell morphology and movement. *Int. Rev. Cell Mol. Biol.* 337:185-211.

***Petrie, RJ**, Harlin, HM, Korsak, LT, and Yamada, KM. 2017. Activating the nuclear piston mechanism to generate intracellular pressure during tumor cell 3D migration. *J. Cell Biol.* 216: 93-100.

***Petrie, RJ** and Yamada, KM. 2016. Multiple mechanisms of 3D migration: the origins of plasticity. *Curr. Opin. Cell Biol.* 42: 7-12.

****Petrie, RJ** and Yamada, KM. 2015. Fibroblasts lead the way: a unified view of three-dimensional cell motility. *Trends Cell Biol.* 25: 666-674.

Artym, VV, Swatkoski, S, Matsumoto, K, Campbell, CB, **Petrie, RJ**, Li, X, Mueller, SC, Bugge, TH, Gucek, M, and Yamada, KM. 2015. Dense fibrillar collagen is a potent inducer of invadopodia via a specific signaling network. *J. Cell Biol.* 208:331-350.

****Petrie, RJ**, Koo, H, and Yamada, KM. 2014. Generation of compartmentalized pressure by a nuclear piston governs cell motility in a 3D matrix. *Science* 345:1062-1065.

***Petrie, RJ** and Koo, H. 2014. Direct measurement of intracellular pressure. *Curr. Prot. Cell Biol.* 63, 12.9.1.

Gutierrez, N, Eromobor, I, **Petrie, RJ**, Vedula, P, Cruz, L, and Rodriguez, AJ. 2014. Spatially regulated β -actin monomer synthesis promotes epithelial adherens junction assembly. *RNA* 20:689-701.

Doyle, AD, **Petrie, RJ**, Kutys, ML, and Yamada, KM. 2013. Dimensions in cell migration. *Curr. Opin. Cell Biol.* 25:642-649.

****Petrie, RJ** and Yamada, KM. 2012. At the leading edge of 3D cell migration. *J. Cell Sci.* 125:5917-5926.

****Petrie, RJ**, Gavara, N, Chadwick, RS, and Yamada, KM. 2012. Nonpolarized signaling reveals two distinct modes of 3D cell migration. *J. Cell Biol.* 197:439-455.

****Petrie, RJ**, Doyle, AD, and Yamada, KM. 2009. Random versus directionally persistent migration. *Nat. Rev. Mol. Cell Biol.* 10:538-549.

Picard, M, **Petrie, RJ**, Antoine-Bertrand, J, Saint-Cyr-Proulx, E, Villemure, JF, and Lamarche-Vane, N. 2009. Spatial and temporal activation of the small GTPases RhoA and Rac1 by the netrin-1 receptor UNC5a during neurite outgrowth. *Cell. Signal.* 21:1961-1973.

Chevallier, J, Koop, C, Srivastava, A, **Petrie, RJ**, Lamarche-Vane, N., and Presley, JF. 2009. Rab35 regulates neurite outgrowth and cell shape. *FEBS Letters* 583:1096-1101.

Petrie, RJ, Zhao, B, Bedford, F, and Lamarche-Vane, N. 2009. Compartmentalized DCC signalling is distinct from DCC localized to lipid rafts. *Biol. Cell* 101:77-90.

Robert, A, Smadja-Lamere, N, Landry, MC, Champagne, C, **Petrie, R**, Lamarche-Vane, N, Hosoya H, Lavoie JN. 2006. Adenovirus E4orf4 hijacks rho GTPase-dependent actin dynamics to kill cells: a role for endosome-associated actin assembly. *Mol. Biol. Cell* 17:3329-3344.

Li, H, Ayer, LM, Polyak, MJ, Mutch, CM, **Petrie, RJ**, Gauthier, L, Shariat, N, Hendzel, MJ, Shaw, AR, Patel, KD, and Deans, JP. 2004. The CD20 calcium channel is localized to microvilli and constitutively associated with membrane rafts. *J. Biol. Chem.* 279: 19893-19901.

Petrie, RJ and Deans, JP. 2002. Colocalization of the B cell receptor and CD20 followed by activation-dependent dissociation in distinct lipid rafts. *J. Immunol.* 169: 2886-2891.

Petrie, RJ, Schnetkamp, PPM, Patel, KD, Awasthi-Kalia, M, and Deans, JP. 2000. Rapid translocation of the B cell receptor and SHIP to lipid rafts: Evidence towards a role in calcium regulation. *J. Immunol.* 165: 1220-1227.

INVITED PRESENTATIONS

McGill University, Anatomy and Cell Biology, March, 2018, Montreal, Canada.

Rutgers University-Camden, Center for Computational and Integrative Biology, December, 2017, Camden, NJ.

Drexel University, DUCOM, 5th International Symposium on Molecular Medicine & Infectious Disease. November, 2017, Philadelphia, PA.

University of Pennsylvania, Physical Sciences Oncology Center, May, 2017, Philadelphia, PA.

Temple University, Bioengineering, March, 2017, Philadelphia, PA.

Biomedical Engineering Society, October, 2016, Minneapolis, MN.

The Hunter Cell Biology Meeting, April, 2016, Hunter Valley, Australia.

University of New South Wales, School of Medical Sciences, April, 2016, Sydney, Australia.

London Research Institute, Lincoln's Inn Fields Laboratories, February, 2015, London, UK.

University of New South Wales, School of Medical Sciences, September 2014, Sydney, Australia.

American Society for Matrix Biology Meeting, Special Interest Group Workshop: The Chemistry and Physics of Fibronectin, October 2014, Cleveland, OH.

American Physical Society Meeting, March 2014, Denver, CO. Invitation declined.

Rutgers Newark, Department of Biological Sciences, November 2013, Newark, NJ.

Catholic University of America, Department of Biology, October 2012, Washington, DC.

SYMPOSIUM PRESENTATIONS

American Society for Cell Biology Meeting, December 2014, Philadelphia, PA.

American Society for Matrix Biology Meeting, October 2014, Cleveland, OH.

ComBio2014, Australian Society for Biochemistry and Molecular Biology Meeting, September 2014, Canberra, Australia.

Signaling by Adhesion Receptors Gordon Conference, June 2014, Lewiston, ME.

UMD-NCI Cancer Technology and Epidemiology Symposium, January 2014, College Park, MD.

American Society for Cell Biology Meeting, December 2013, New Orleans, LA.

FASEB Regulation and Function of Small GTPases Meeting, June 2013, Steamboat Springs, CO.

American Society for Matrix Biology Meeting, October 2010, Charleston, SC.

TEACHING AND MENTORING

- 2016-Present Undergraduate STAR Scholars: Blaise Leonchuck, Jade-Lyn Gray, and Shivani Patel.
BIO430/630 Cell Biology of Disease and BIO433/532 Advanced Cell Biology
BIO497 (Mentoring undergraduate researchers Nikita Dahake, Donna Kwon, Nicole Naranjo, and Kimheak Sao).
Graduate Students: Pragati Chengappa and Tia Jones.
- 2017 Guest instructor for the RUN IMAGE program (Rutgers University – Newark) designed to introduce local high school students to cell biology and microscopy
- 2012-2015 Instructor for Introductory Biochemistry (BIOC 301/302) for the Foundation for Advanced Education in the Sciences Graduate School
- 2011-2015 Mentored five trainees, NIDCR Summer Internship Program
- 2010 Co-leader, Summer Intern journal club, Cell Biology in 3-Dimensions
- 2005-2006 Mentored undergraduate Janet Prince (received her PhD in 2012)

SCIENTIFIC OUTREACH

- 2017 Biosights video podcast, Journal of Cell Biology
http://jcb.rupress.org/sites/default/files/biosights/biosights_jan_02_2017.m4v
- 2014 LabTV, Medical Research Profile
<https://www.labtv.com/Profiles/Researcher?Id=607#/>
- 2012 Biosights video podcast, Journal of Cell Biology
http://www.rupress.org/site/biosights/biosights_may_14_2012.m4v

SERVICE

- 2008-Present Ad hoc reviewer for: Agence Nationale de la Reserche (ANR, France), Annual Review of Biophysics, the Biophysical Journal, Current Biology, eLife, Faculty of 1000, FASEB Journal, Journal of Cell Biology, Journal of Cell Science, Nature Cell Biology, Nature Communications, Nature Reviews Molecular Cell Biology, Oncogene, Trends in Cell Biology
- 2016-Present Co-chair, Strategic Planning Committee, Member, Graduate Research Committee, Member, Committee on committees, Organizer, Biology Seminar Series
- 2017-Present Member of the ASCB Scientific Program Taskforce and the ASMB membership committee
- 2012-2015 Judge, ASCB Poster Competition

- 2014 Volunteered on behalf of the American Society for Cell Biology (ASCB) at the Science and Engineering Festival, Washington D.C.
- 2012-2013 Lead judge, NIH Graduate Student Symposium poster competition, Biochemistry section
- 2012 Demonstrator for Microscopy Day: Magnify it!; hosted by the National Museum of Health and Medicine
- 2011-2012 Co-chair, Fellows Award for Research Excellence (FARE) 2013 committee
- 2011 Member, FARE 2012 committee
- 2011, 2013 Chief judge, FARE, Cell Biology section
- 2011 Judge, NIH Graduate Student Symposium poster competition
- 2011-2014 Member, NIDCR Summer Dental Student Award selection committee
- 2011, 2014 Member, NIDCR Directors Recognition committee
- 2010-2012 NIDCR Basic Science representative, NIH Fellows committee
- 2009-2013 Member, NIDCR Fellows Retreat planning committee
- 2003-2006 Vice-President Academic, McGill Anatomy and Cell Biology Graduate Student Association
- 2003-2006 Volunteer, Let's Talk Science, a community outreach organization
- 2001 Student representative, Cell Biology search committee – Faculty recruitment, University of Calgary
- 2001 Vice-President, Medical Science Graduate Students Association (MSGSA) "A Tour of the Cell" Symposium committee, University of Calgary
- 2000 MSGSA representative, Faculty of Medicine Promotions committee, University of Calgary

CAREER DEVELOPMENT

- 2017 HHMI: Promoting Student Learning in Large STEM Classrooms, Drexel University, Philadelphia, PA
- 2014 Protein Bioinformatics, Biotechnology training course, FAES, Bethesda, MD
- 2012 Scientists Teaching Science, 9-week pedagogy course, NIH, Bethesda, MD
- 2010 Intravital Microscopy Hands-On Workshop, NIH, Bethesda, MD
- 2008 Small Interfering RNA (siRNA) and Functional Genomics, Biotechnology training course, FAES, Bethesda, MD
- 2003 Quantitative imaging course: from molecules to cells, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY
- 2000 Physiology course: The Biochemical and Molecular Basis of Cell Signaling, Marine Biological Laboratory, Woods Hole, MA