

# Pascale G. Charest

*Associate Professor*

Department of Molecular and Cellular Biology  
Department of Chemistry and Biochemistry  
University of Arizona Cancer Center, BIO5 Institute  
University of Arizona, Tucson, AZ  
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## EDUCATION

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- 1998 *B.Sc. Biochemistry, Université de Sherbrooke, Sherbrooke, Canada*
- 2000 *M.Sc. Biochemistry, Université de Montréal, Montréal, Canada*  
Advisor: Professor Michel Bouvier  
Thesis title: *Study of the V2 vasopressin receptor palmitoylation*  
Major field: Biochemistry
- 2005 *Ph.D. Biochemistry, Université de Montréal, Montréal, Canada*  
Advisor: Professor Michel Bouvier  
Thesis title: *Study of G protein-coupled receptor-mediated activation of ERK1/2 MAP kinases—Role of the adaptor protein beta-arrestin*  
Major field: Biochemistry and Molecular Pharmacology

## EMPLOYMENT AND APPOINTMENTS

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- 2000–2005 *Teaching Assistant (undergraduate biochemistry labs)*  
Department of Biochemistry, Université de Montréal, Montréal, Canada
- 2003-2005 *Lecturer (medical curriculum)*  
Department of Biochemistry, Université de Montréal, Montréal, Canada
- 2005–2010 *Postdoctoral Research Associate*  
Division of Biological Sciences, Section of Cell and Developmental Biology, University of California-San Diego, La Jolla, CA  
Advisor: Richard A. Firtel
- 2010–2012 *Assistant Project Scientist (Research Faculty)*  
Division of Biological Sciences, Section of Cell and Developmental Biology, University of California-San Diego, La Jolla, CA
- 2012–2019 *Assistant Professor*  
Department of Chemistry and Biochemistry, University of Arizona, Tucson, AZ  
Note: *Tenure clock delayed one year for birth of a child in 2012*
- 2015–present *Faculty Member*  
University of Arizona Cancer Center, Tucson, AZ

2015–present *Faculty Member*  
Cancer Biology GIDP, University of Arizona, Tucson, AZ

2016–present *Faculty Member*  
BIO5 Institute, University of Arizona, Tucson, AZ

2019–present *Associate Professor*  
Department of Molecular and Cellular Biology, University of Arizona, Tucson, AZ  
Department of Chemistry and Biochemistry, University of Arizona, Tucson, AZ

## **HONORS AND AWARDS**

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Undergraduate research summer fellowship (1997)  
Université de Sherbrooke, Sherbrooke, Canada

Graduate research fellowship, declined (1999)  
Société Québécoise d'Hypertension Artérielle

Graduate research fellowship (1999-2000)  
Canadian Hypertension Society

Poster presentation award (2000)  
Société Québécoise d'Hypertension Artérielle, annual scientific meeting, Montréal, Canada

Graduate research fellowship (2000)  
Université de Montréal, Montréal, Canada

Graduate research fellowship, declined (2001)  
Canadian Hypertension Society

Graduate research fellowship (2001-2003)  
Fonds de la Recherche en Santé du Québec

Graduate research fellowship (2001-2004)  
Heart and Stroke Foundation of Canada

Postdoctoral research fellowship (2005-2008)  
Fonds de la Recherche en Santé du Québec

American Cancer Society Research Scholar (2015)

University of Arizona nominee for the National Camille Dreyfus Teacher-Scholar award (2017)

**SERVICE/OUTREACH**

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**Outreach***Local outreach*

May 2012, 2013, 2014, Poster fair judge  
 Summer 2013, Biochemistry Club/Middle School Summer Camp presenter  
 Summer 2017, Mentor, Cienega High School senior exit program  
 Oct 2019, Meet MCB 2019 event, Tours of the Charest lab to 82 students from 6 local high schools  
 Oct 2019, Presentation and guided activity "Meet Dicty the amoeba", lower elementary classes, Khalsa Montessori School

*State outreach*

May 2015, Interview with Arizona Public Media-NPR on research funded by the American Cancer Society  
 May 2016, Presenter at the American Cancer Society Climb to Conquer luncheon, Phoenix, AZ

**Institutional service***Departmental committees and service*

2012-2016, Graduate admissions committee  
 Feb 2013, 2014, 2015, 2016, 2017, 2018 Annual peer review reviewer  
 2013-2015, Biochemistry seminar coordinator  
 2013-2015, CBC/CMM /MCB joint seminar committee  
 2013-2016, Recruitment of sponsors for departmental seminars  
 2013-2016, Joint Biological and Biomedical Retreat committee  
 2015-2016, CBC faculty search committee  
 2016, Working group for evaluating and recommending plan for CBC's teaching enterprise  
 2016, CBC graduate student awards committee, ad hoc member  
 2016-2018, Graduate program committee  
 2016-2018, Faculty advisor for the Program to Advance Women Scientists (PAWS) in Chemistry and Biochemistry  
 2018, CBC professional behavior working group  
 2018, CBC faculty search committee  
 2018, CBC C4 (Climate, Culture & Conduct Committee)  
 2017-2018, BMCB graduate program executive committee  
 2012-present, Dissertation committees (26 total, 18 currently)  
 2019-present, Joint Biological and Biomedical Retreat committee  
 2019-present, MCB undergraduate curriculum committee  
 Spring 2020, Undergraduate Biology Research Program (UBRP) selection committee

*College committees and service*

2013, 2014, Medical School Multiple Mini Interview (MMI) evaluator for the College of Medicine  
 2013-2018, College of Science Awards Committee

*University service*

Spring 2015, Grant reviewer, Cancer Center Support Grants, Pilot Project for basic/clinical partnerships to promote translational research  
 Fall 2016, Grant reviewer, American Cancer Society Institutional Research Grants  
 Spring 2017, Grant reviewer, RDI Faculty Seed Grants  
 Fall 2017, Grant reviewer, American Cancer Society Institutional Research Grants

Fall 2018, Grant reviewer, NCI Predoctoral to Postdoctoral Fellow Transition Award–Institutional selection of applicant

Spring 2020, Grant reviewer, RDI – Research Advancement Grant: Equipment Enhancement Fund

***National and International service***

*Memberships in professional societies*

American Association for the Advancement of Science  
The American Society for Biochemistry and Molecular Biology  
The American Society for Cell Biology  
Faculty of 1000

*Service as manuscript reviewer (total number of manuscripts reviewed for each journal indicated)*

Biomolecules (5)  
Biotechniques (1)  
Cancer Biomarkers (1)  
Cellular Signaling (1)  
Communications Biology (2)  
Developmental Cell (2)  
Development Growth and Differentiation (1)  
Differentiation (2)  
European Journal of Cell Biology (2)  
FEBS Letters (2)  
FEMS Microbiology Reviews (1)  
Journal of Biological Chemistry (1)  
Journal of Cell Science (2)  
Journal of Visualized Experiments (1)  
mBIO (1)  
Microbiological Research (1)  
Molecular Biology of the Cell (8)  
mSphere (1)  
Nature Cell Biology (2)  
Open Biology (2)  
PLoS Biology (1)  
Proceedings of the National Academy of Science (4)  
Protein Science (1)  
Science Signaling (4)  
Scientific Reports (1)  
Small GTPases (2)

*Service as external grant reviewer*

Fall 2015, Natural Science and Engineering Research Council of Canada  
Spring 2017, Natural Science and Engineering Research Council of Canada  
Spring 2018, NIH, Intercellular Interactions (ICI) study section, Early Career Reviewer  
Fall 2018, FWF Austrian Science Fund

*Service in international scientific meetings*

Session chair, 2013 Annual International *Dictyostelium* Conference, Asheville, NC  
Organizer and meeting chair, 2016 Annual International *Dictyostelium* Conference, Tucson AZ  
Session chair, 2019 Annual International *Dictyostelium* Conference, Ann Harbor, MI

**PUBLICATIONS**

\* Indicates publication based on work performed prior to initial faculty appointment (as graduate student, postdoctoral researcher, or assistant project scientist)

For publications based on work done in current faculty position, authors are designated as follows:

<sup>U</sup>, undergraduate student; <sup>G</sup>, graduate student; <sup>P</sup>, postdoctoral researcher; <sup>S</sup>, staff scientist; <sup>C</sup>, collaborator; <sup>SC</sup>, student or staff of collaborator.

**Refereed journal articles (published or accepted in final form)**

1. \* M. Azzi, P.G. Charest, S. Angers, M. Bouvier and G. Pineyro. "βArrestin-mediated activation of MAPK by inverse agonists reveals distinct active conformations for GPCRs". *Proc. Natl. Acad. Sci. U S A* 100(20):11406-11 (2003).  
*Recommended by Faculty of 1000, 27 Sep 2006*
2. \* P.G. Charest and M. Bouvier. "Palmitoylation of the V2 vasopressin receptor carboxyl tail facilitates βarrestin recruitment leading to efficient receptor endocytosis and ERK1/2 activation". *J. Biol. Chem.* 278(42):41541-51 (2003).
3. \* J. Perroy, S. Pontier, P.G. Charest, M. Aubry and M. Bouvier. "Real-time monitoring of ubiquitination in living cells by BRET". *Nat. Meth.* 1(3):203-8 (2004).  
*Recommended by Faculty of 1000, 7 Jan 2005*
4. \* P.G. Charest, S. Terrillon and M. Bouvier. "Monitoring agonist-promoted conformational changes of β-arrestin in living cells by intramolecular BRET". *EMBO rep.* 6(4): 334-40 (2005).
5. \* P.G. Charest and R.A. Firtel. "Feedback signaling controls leading edge formation during chemotaxis". *Curr. Opin. Genet. Dev.* 16(4):339-47 (2006).
6. \* P.G. Charest, G. Oigny-Longpré, H. Bonin, M. Azzi and M. Bouvier. "The V2 vasopressin receptor stimulates ERK1/2 activity independently of heterotrimeric G protein signalling". *Cell. Signal.* 19(1):32-41 (2007).
7. \* A.T. Sasaki, C. Janetopoulos, S. Lee, P.G. Charest, K. Takeda, L.W. Sunddheimer, R. Meili, P.N. Devreotes and R.A. Firtel. "G Protein-Independent Ras/PI3K/F-Actin Circuit Regulates Basic Cell Motility". *J. Cell. Biol.* 178(2):185-91 (2007).  
*Recommended by Faculty of 1000, 27 Sep 2007*
8. \* F.F. Hamdan, M.D. Rochdi, B. Breton, D. Fessart, D.E. Michaud, P.G. Charest, S.A. Laporte and M. Bouvier. "Unraveling g protein-coupled receptor endocytosis pathways using real-time monitoring of agonist-promoted interaction between beta-arrestins and AP-2". *J. Biol. Chem.* 282(40):29089-100 (2007).
9. \* P.G. Charest and R.A. Firtel. "Big roles for small GTPases in the control of directed cell movement". *Biochem. J.* 401(2):377-90 (2007).
10. \* S. Zhang<sup>#</sup>, P.G. Charest<sup>#</sup>, and R.A. Firtel. "Spatio-temporal Regulation of Ras Activity Provides Directional Sensing". *Curr. Biol.* 18(20):1587-93 (2008). <sup>#</sup> Equal authorship.  
*Recommended by Faculty of 1000, 23 Sep 2009*
11. \* V. Kölsch, P.G. Charest and R.A. Firtel. "The regulation of cell motility and chemotaxis by phospholipid signaling". *J. Cell Sci.* 121(Pt 5):551-9 (2008).

12. \* P.G. Charest, Z. Shen, A. Lakoduk, A.T. Sasaki, S.P. Briggs and R.A. Firtel. “A Ras signaling complex controls the RasC-TORC2 pathway and directed cell migration”. *Dev. Cell.* 18:737-49 (2010).  
*Cover article*  
*Highlighted in Nature Structural and Molecular Biology, 17: 678 (2010)*  
*Recommended by Faculty of 1000, 5 Aug 2010*  
*Press release: “UC San Diego biologists unravel mechanisms of how immune cells move”. UCSD Division of Biological Sciences News, May 17, 2010*
13. \* P.G. Charest and R.A. Firtel. “TORCing” neutrophil chemotaxis”. *Dev. Cell* 19(6):795-6 (2010).
14. \* Hecht, M.L. Skoge, P.G. Charest, E. Ben-Jacob, R.A. Firtel, W.F. Loomis, H. Levine, and W.J. Rappel. “Activated membrane patches guide chemotactic cell motility”. *PLoS Comput. Biol.* 7(6):e1002044 (2011).
15. \* K. Takeda, D. Shao, M. Adler, P.G. Charest, W.F. Loomis, H. Levine, A. Groisman, W.J. Rappel, and R.A. Firtel. “Incoherent feedforward control governs adaptation of activated Ras in eukaryotic chemotaxis pathway”. *Sci. Signal.* 5, ra2 (2012).
16. \* V. Kölsch, Z. Shen, S. Lee, K. Plak, P. Lotfi, J. Chang, P.G. Charest, J.L. Romero, T.J. Jeon, A. Kortholt, S.P. Briggs, and R.A. Firtel. “Daydreamer, a Ras effector and GSK-3 substrate, is important for directional sensing and cell motility”. *Mol. Biol. Cell.* 24(2):100-14 (2013).
17. \* K. Sumita, H. Yoshino, M. Sasaki, N. Majd, E.R. Kahoud, H. Takahashi, K. Takeuchi, T. Kuroda, S. Lee, P.G. Charest, K. Takeda, J.M. Asara, R.A. Firtel, D. Anastasiou, and A.T. Sasaki. “Degradation of activated K-Ras orthologue via K-Ras specific lysine residues is required for cytokinesis”. *J. Biol. Chem.* 289:3950-9 (2014).
18. A. Khanna<sup>SC\*</sup>, P. Lotfi<sup>T\*</sup>, A.J. Chavan<sup>P</sup>, N.M. Montañó<sup>G</sup>, P. Bolourani<sup>SC</sup>, G. Weeks<sup>C</sup>, Z. Shen<sup>SC</sup>, S.P. Briggs<sup>C</sup>, H. Pots<sup>SC</sup>, P.J.M Van Haastert<sup>C</sup>, A. Kortholt<sup>C</sup>, and P.G. Charest. “The small GTPases Ras and Rap1 bind to and control TORC2 activity”. *Sci. Rep.* 6:25823 (2016). \*equal contribution.  
*Recommended by Faculty of 1000, 2 Jun 2016*
19. AFM T. Islam<sup>P</sup>, B.M. Stepanski<sup>U</sup>, and P.G. Charest. “Studying chemoattractant signal transduction dynamics in *Dictyostelium* by BRET”. *Methods Mol. Biol.* 1407:63-77 (2016).
20. M. Scavello<sup>G</sup>, A.R. Petlick<sup>G</sup>, R. Ramesh<sup>U</sup>, V.F. Thompson<sup>S</sup>, P. Lotfi<sup>S</sup>, and P.G. Charest. “Protein kinase A regulates the Ras, Rap1 and TORC2 pathways in response to the chemoattractant cAMP in *Dictyostelium*”. *J. Cell Sci.*, 130:1545-1558 (2017).  
*Featured in the front section of the journal.*
21. AFM T. Islam<sup>S</sup>, H. Yue<sup>SC</sup>, M. Scavello<sup>G</sup>, P. Haldeman<sup>U</sup>, W.J. Rappel<sup>C</sup>, and P.G. Charest. “The cAMP-induced G protein subunits dissociation monitored in live *Dictyostelium* cells by BRET reveals two activation rates, a positive effect of caffeine and potential role of microtubules”. *Cell. Signal.*, 48:25-37 (2018).
22. AFM T. Islam<sup>S</sup>, M. Scavello<sup>G</sup>, P. Lotfi<sup>S</sup>, P. Haldeman<sup>U</sup>, D. Daniel<sup>G</sup>, and P.G. Charest. Caffeine inhibits PI3K and mTORC2 in *Dictyostelium* and differentially affects multiple other cAMP chemoattractant signaling effectors. *Mol. Cell. Biochem.*, 457:157-168 (2019).

## **Patents**

1. \* M. Bouvier and P. Charest. Double brilliance beta-arrestin: A biosensor for monitoring the activity of receptors and signaling molecules, and methods of using same. Publication number CA 2,607,015 (2005). Patent number US 7,932,080 (2011).
2. \* M. Bouvier, P. Charest, C. LeGouill, A. Beautrait. Arrestin Biosensor. Publication number US 2011/0275134 (2011) and CA 2,775,278 (2012).

## **Dissertations and theses guided**

1. A.R. Petlick. Toward Determining the role of PKA in controlling TORC2 function and chemotaxis in *Dictyostelium discoideum*. MSc thesis (2014).
2. A.M. Hanson. TORC2 mediated-chemotaxis in mammary epithelial cells. MSc thesis (2016).
3. M. Scavello. Uncovering the role of Protein Kinase A in *Dictyostelium* chemotaxis toward cyclic adenosine monophosphate. PhD dissertation (2018).

## **CONFERENCES/SCHOLARLY PRESENTATIONS (LIMITED TO PERIOD IN CURRENT RANK)**

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### **Invited talks (local)**

CBC/CMM/MCB Joint Retreat, Biosphere 2, Sep 2011

Drug Discovery and Developmental Therapeutics Seminar Series, College of Pharmacy, University of Arizona, Feb 2013

Arizona Imaging and Microanalysis Society annual conference, Tucson, Arizona, Mar 2013

Biological Chemistry Program Journal Club, University of Arizona, Sep 2013

Department of Immunobiology, University of Arizona, Oct 2013

Arizona Research Institute for Biomedical Imaging (ARIBI) spring workshop, Tucson, AZ, Apr 2014

Department of Basic Medical Sciences, College of Medicine, University of Arizona, Phoenix, AZ, Nov 2015

Microbiology and Immunobiology "Microlunch" seminar series, University of Arizona, Mar 2017

### **Invited talks (National and International)**

Biotechnology and Biological Sciences Research Council Workshop, Vanderbilt U., Nashville, TN, Mar 2012

Gordon Research Conference on Phosphorylation and G Protein-Mediated Signaling Networks, Biddeford, ME, (Poster talk), Jun 2014

Gordon Research Conference on Directed Cell Migration, Galveston, TX, (Poster talk). Jan 2015

Pennsylvania Muscle Institute, School of Medicine, University of Pennsylvania, Sept 2015

NIH/NIAID, Twinbrook campus, Rockville, MD, Sept 2015

Department of Genetics, Cell Biology and Development, University of Minnesota, Minneapolis, MN, Sep 2017

Department of Microbiology & Molecular Genetics, Oklahoma State University, Stillwater, OK, Sep 2017

Department of Biological Sciences, Hunter College, City University of New York, New York, NY, Nov 2017

Department of Biology, Texas A&M University, College Station, TX, Mar 2018

Gordon Research Conference on Phosphorylation and G Protein-Mediated Signaling Networks, Biddeford, ME, (Poster talk), Jun 2018

Department of Biomedical Sciences, New York Institute of Technology, Old Westbury, NY, Dec 2018

Department of Biology, University of Massachusetts, Amherst, MA, Feb 2019

Department of Cancer Biology, University of Toledo, Toledo, Ohio, Feb 2019

Department of Integrative Biology and Pharmacology, University of Texas Health, Houston, TX, Feb 2019

Department of Biochemistry, Microbiology, and Immunology, Wayne State University, Detroit, MI, Mar 2019

Annual International *Dictyostelium* Conference, Ann Harbor, MI, Aug 2019

### **Contributed talk**

Annual International *Dictyostelium* Conference, Asheville, NC, Aug 2013

### **Poster presentations at International Meetings (presenter underlined)**

A. Khanna<sup>SC\*</sup>, P. Lotfi<sup>T\*</sup>, N.M. Montaño<sup>G</sup>, P. Bolourani<sup>SC</sup>, G. Weeks<sup>C</sup>, Z. Shen<sup>SC</sup>, S.P. Briggs<sup>C</sup>, H. Pots<sup>SC</sup>, P.J.M Van Haastert<sup>C</sup>, A. Kortholt<sup>SC</sup>, and P.G. Charest. "The small GTPases Ras and Rap1 bind to and control TORC2 activity". Gordon Research Conference on Phosphorylation and G Protein-Mediated Signaling Networks, Biddeford, ME, Jun 2014 (**selected for short talk**).

M. Scavello<sup>G</sup>, A.R.Petlick<sup>G</sup>, V.F. Thompson<sup>T</sup>, P. Lotfi<sup>T</sup>, and P.G. Charest. "PKA spatiotemporally controls chemoattractant signaling pathways and is critical for gradient sensing in *Dictyostelium*". Gordon Research Conference on Directed Cell Migration, Galveston, TX, Jan 2015 (**selected for short talk**).

A. Khanna<sup>SC\*</sup>, P. Lotfi<sup>T\*</sup>, N.M. Montaño<sup>G</sup>, P. Bolourani<sup>SC</sup>, G. Weeks<sup>C</sup>, Z. Shen<sup>SC</sup>, S.P. Briggs<sup>C</sup>, H. Pots<sup>SC</sup>, P.J.M Van Haastert<sup>C</sup>, A. Kortholt<sup>SC</sup>, and P.G. Charest. "The small GTPases Ras and Rap1 bind to and control TORC2 activity". American Society for Cell Biology Annual Meeting, San Diego, CA, December 2015.



M. Scavello<sup>G</sup>, A.R.Petlick<sup>G</sup>, V.F. Thompson<sup>T</sup>, P. Lotfi<sup>T</sup>, and P.G. Charest. “PKA spatiotemporally controls chemoattractant signaling pathways and is critical for gradient sensing in *Dictyostelium*”. American Society for Cell Biology Annual Meeting, San Diego, CA, December 2015.

AFM T. Islam<sup>P</sup>, B.M. Stepanski<sup>U</sup>, and P.G. Charest. “Studying chemoattractant signal transduction dynamics in *Dictyostelium* by BRET”. American Society for Cell Biology Annual Meeting, San Diego, CA, December 2015 (**selected for short talk**).

A. Khanna<sup>SC\*</sup>, P. Lotfi<sup>T\*</sup>, A.J. Chavan<sup>P</sup>, N.M. Montañó<sup>G</sup>, P. Bolourani<sup>SC</sup>, G. Weeks<sup>C</sup>, Z. Shen<sup>SC</sup>, S.P. Briggs<sup>C</sup>, H. Pots<sup>SC</sup>, P.J.M Van Haastert<sup>C</sup>, A. Kortholt<sup>SC</sup>, and P.G. Charest. “The small GTPases Ras and Rap1 bind to and control TORC2 activity”. Annual International *Dictyostelium* Conference, Tucson, AZ, Aug 2016.

AFM T. Islam<sup>P</sup>, P. Haldeman<sup>U</sup>, B.M. Stepanski<sup>U</sup>, and P.G. Charest. “Heterotrimeric G protein activation and regulation monitored by Bioluminescence Resonance Energy Transfer (BRET)”. Annual International *Dictyostelium* Conference, Tucson, AZ, Aug 2016.

M. Scavello<sup>G</sup>, A.R.Petlick<sup>G</sup>, R.Ramesh<sup>U</sup>, V.F. Thompson<sup>T</sup>, P. Lotfi<sup>T</sup>, and P.G. Charest. “The role of PKA in *Dictyostelium* chemotaxis”. Gordon Research Conference on Directed Cell Migration, Galveston, TX, Jan 2017.

AFM T. Islam<sup>S</sup>, H. Yue<sup>SC</sup>, M. Scavello<sup>G</sup>, P. Haldeman<sup>U</sup>, W.J. Rappel<sup>C</sup>, and P.G. Charest. “Quantitative analyses of chemoattractant-induced heterotrimeric G protein activation kinetics in *Dictyostelium* reveal important role for high affinity pre-coupled receptors”. Gordon Research Conference on Phosphorylation and G Protein-Mediated Signaling Networks, Biddeford, ME, June 2018 (**selected for short talk**).

S. Collins<sup>G</sup>, I. Brown<sup>U</sup>, and P.G. Charest. “Mechanistic Target of Rapamycin Complex 2 (mTORC2) Regulation in Cancer Cell Migration”. Gordon Research Conference on Directed Cell Migration, Galveston, TX, Jan 2019 (**selected for short talk**).

S.F. Smith<sup>G</sup>, E. Weiss<sup>U</sup>, and P.G. Charest. “Investigating the Ras-mediated activation of mTORC2”. Annual International *Dictyostelium* Conference, Ann Harbor, MI, Aug 2019.

J. Takashima<sup>U</sup>, AFM T. Islam<sup>S</sup>, M. Schultz<sup>U</sup>, and P.G. Charest. “Investigating the cAR1:G $\alpha$ 2 $\beta$  $\gamma$  interaction in *Dictyostelium* by Bioluminescence Resonance Energy Transfer”. Annual International *Dictyostelium* Conference, Ann Harbor, MI, Aug 2019.

J. Takashima<sup>U</sup>, AFM T. Islam<sup>S</sup>, and P.G. Charest. “APEX2-mediated proximity labelling in *Dictyostelium discoideum*”. Undergraduate Biology Research Program Conference, Tucson, AZ Jan 2020.

## **MEDIA COVERAGE**

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Arizona Public Media-NPR story “UA Researcher Wins \$792K Grant for Cancer Study”, May 2015.  
<https://www.azpm.org/s/31016-ua-researcher-wins-792k-grant-for-cancer-study/>

**AWARDED GRANTS**

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**Private Foundations**

- American Cancer Society, Research Scholar Grant. 2015-2019  
*Signaling mechanisms underlying the directed motility of eukaryotic cells.*  
 Total award: \$792,000  
 Role: PI (90% of the project effort; Wouter Jan-Rappel, collaborator, 10% effort)
- University of Arizona Foundation, Faculty Seed Grant. 2014-2015  
*Ras proteins activate TORC2 to promote cancer cell metastasis.*  
 Total award: \$10,000  
 Role: PI (100% of the project effort)

**Governmental organizations**

- NIH-NIGMS, 1 R01 GM131200-01A1 2019-2024  
*The role and regulation of mTORC2 in cell migration.*  
 Total award: \$1,519,084  
 Role: PI (100% of the project effort)
- Improving Health TRIF Initiative Equipment Grant Jan 2019  
*Total Internal Reflection Fluorescence Illumination Module Upgrade for the Spinning Disk Confocal Microscope to Enable High-Resolution Surface Imaging in the Keck Center*  
 Total award: \$50,000  
 Role: PI
- UA Technology Research Initiative Funds, TRIF Optics/Imaging grant. Jan 2016  
*An environmental control system for a spinning disk confocal microscope.*  
 Total award: \$37,000  
 Role: PI

Training grants

- NIH 1 R25 GM121228 (PI: Margaret Briehl) 2018-2023  
*University of Arizona Postbaccalaureate Research Education Program*  
 Role: Mentor
- Arnold and Mabel Beckman Foundation, Beckman Scholars Program Award (PI: Ghosh) 1999-2021  
 Role: Mentor
- NIH T32 GM008659 (PI: Capaldi; Co-PI: Weinert) 1997-2020  
*Graduate Training in Biochemistry and Molecular Biology*  
 Role: Mentor
- NIH T32 GM008804 (PI: Montfort) 2003-2019  
*Chemistry-Biology Interface Training Program*  
 Role: Mentor

**TEACHING ACTIVITIES****Courses taught** (contact hours and enrollment indicated)

BIOC296B	Introduction to Experimental Biochemistry (1h/week; Fall 2013, 78 students; Fall 2014, 76 students; Fall 2015, 65 students; Fall 2016, 69 students; Fall 2018, 68 students)
BIOC568	Nucleic Acids, Signaling and Metabolism (4h/week; Spring 2013, 16 students; Spring 2014, 18 students; Spring 2015, 16 students; Spring 2016, 12 students; Spring 2017, 19 students; Spring 2018, 25 students; Spring 2019, 19 students)
MCB195C	Introduction to Research in Molecular and Cellular Biology (1h/week; Fall 2019, 16 students; Spring 2020, 16 students)
MED819	Medical Foundations, 4 lectures (Fall 2012, 140 students; Fall 2013, 120 students; Fall 2014, 116 students; Fall 2015, 119 students; Fall 2016, 135 students; Fall 2018, 120 student)

**Student mentored** (Following and current positions indicated; \* indicates authorship on peer reviewed publications)*High school students (KEYS program)*

Ethan Weiss	Summer 2016, 2017	Biochemistry major, U. Arizona
Jordan Pilch	Summer 2017	Molecular and Cellular Biology major, U. Arizona
Zoe Benson	Summer 2018	Ecology and Evolutionary Biology major, U. Arizona
Makaela Valencia	Summer 2020	

*Undergraduate students*

Branden Stepanski*	2012-2014 (BSc)	University of Utah MSc (2018), Forensic scientist
Joseph Cada	2013-2015 (BSc)	Law student, Arizona State University
Matthew O'Mara	2014-2017 (BSc)	Research associate, Grail Biosciences
Pearce Haldeman*	2015-2017 (BSc)	Research specialist, Caltech; Applying to Medical Schools
Ramya Ramesh*	2014-2018 (BSc)	UA Medical School, class of 2022
McKenna Schultz*	2017-2019 (BSc)	Applying to Medical Schools
Isabella Brown	2018-2020 (BSc)	Graduate School, UT Southwestern
Ethan Weiss	2017-present	
Jamison Takashima	2018-present (2019-2020 Beckman Scholar)	
Avani Kumar	2018-present	
Nitant Soni	2019-present	
Stephen Dilley	2019-present	
Isabella Feldmann	2019-present	
Hannah Johnson	2020-present	
Shon Alimukhamedov	2020-present	
Isabelle Mundo	2020-present (UBRP scholar)	

*Graduate students*

Alexandra Petlick*	2012-2014 (Chemistry MSc)	Associate investigator, The Chemours Company
Nieves Montano*	2012-2014 (Biochemistry MSc)	Teacher, Paulo Freire Freedom School
Amanda Hanson	2014-2016 (Biochemistry MSc)	Research associate, Translational Genomics Research Institute
Dustin Daniel*	2014-2016 (Applied Biosci. MSc)	Research associate, University of Arizona MBA Arizona State U.

Maggie Scavello*	2014-2018 (2015-2017 BCP T32 fellow, Biochemistry PhD) Research scientist, Eurofins Lancaster Laboratories
Shannon Collins	2016-2020 (2016-2018 BCP T32 fellow, Biochemistry PhD) Finishing MD part of MD/PhD degree, class of 2021
Stephen Smith	2017-present (2017-2019 BCP T32 fellow, Biochemistry)
Agata Orlinski	2017-present (Biochemistry)
Alyssa Werner	2018-present (2019-2021 BCP T32 fellow, Biochemistry)
Genesis Cahigas	2018-present (Biochemistry)
Mollie Wiegand	2020-present (Molecular and Cellular Biology)

*Postdoctoral advising*

AFM Tariqul Islam*	2013-2016	Assistant research scientist in Charest lab
Anita Chavan*	2015-2017	Post-doctoral researcher, Worcester Polytechnic Institute

**Contributions to Instructional Innovations and Collaborations**

*Teaching workshops attended*

Fall 2013	AAU-STEM Education Project: Teaching Talks (3) AAU-STEM Faculty Learning Community, participant
Spring 2014	AAU-STEM Education Project: Teaching Talks (4) AAU-STEM Faculty Learning Community, participant

*Development of course materials*

2013-2014	Development of new curriculum for BIOC568, with inclusion of active learning exercises
2014	Developed in-class active learning and assessment exercises for MED819
2014	Developed new course objectives and material for BIOC296B
2014-present	Continued development of new course material for BIOC568
2018	Developed new course material and notes for new lecture in MED819
2018	Developed new format, material, in-class active learning and assessment exercises for BIOC296B
2019	Developed new format, material, in-class active learning and assessment exercises for MCB195C