

## Curriculum Vitae

# Tamara J. O'Connor, PhD

### PROFESSIONAL EDUCATION and APPOINTMENTS

#### Professional Appointment

Assistant Professor  
Department of Biological Chemistry  
Johns Hopkins School of Medicine

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#### Education and Training

	<u>Year</u>	<u>Degree/Institution</u>	<u>Discipline</u>
Undergraduate	1998	B.Sc., McMaster University	Biochemistry
Doctorate	2005	Ph.D., McMaster University	Biochemistry/Microbiology
Postdoctorate	2013	Tufts University School of Medicine	Microbial Pathogenesis

#### Professional Experience

1997-1998 Undergraduate Thesis

Laboratory of Dr. Gerry D. Wright, Department of Biochemistry, McMaster University  
Enzymatic characterization of an aminoglycoside antibiotic modifying enzyme.

1998-2005 Doctoral Thesis

Laboratory of Dr. Justin R. Nodwell, Department of Biochemistry, McMaster University  
Establishing cell fate in the multicellular bacterium *Streptomyces coelicolor*

2005-2013 Postdoctoral Fellowship

Laboratory of Dr. Ralph R. Isberg, Department of Molecular Biology and Microbiology,  
Tufts University School of Medicine  
Elucidating the molecular basis of *Legionella pneumophila* pathogenesis and the role of  
environmental hosts in the evolution of virulence strategies

### RESEARCH ACTIVITIES

#### Publications: Peer-Reviewed Science Research

**O'Connor TJ**, Kanellis P, Nodwell J. (2002) The *ramC* gene is required for morphogenesis in *Streptomyces coelicolor* and expressed in a cell type-specific manner under the direct control of RamR. *Mol Microbiol* 45: 45-57.

**O'Connor TJ** and Nodwell J. (2005) Pivotal roles for the receiver domain in the mechanism of action of the response regulator RamR of *Streptomyces coelicolor*. *J Mol Biol* 351:1030-1047.

VanRheenen S, Luo ZQ, **O'Connor TJ**, Isberg RR. (2006) Members of a *Legionella pneumophila* family of proteins with ExoU/phospholipase A active sites are translocated to target cells. *Infect Immun* 74:3597-3606.

Isberg RR, **O'Connor TJ**, Heidtman M (2009) *The Legionella pneumophila* replication vacuole: making a cosy niche inside host cells. *Nature Reviews Microbiology* 7:13-24.

Huang L, Boyd D, Amyot WM, Hempstead AD, Luo ZQ, **O'Connor TJ**, Chen C, Machner M, Montminy T, Isberg RR. (2011) The E Block motif is associated with *Legionella pneumophila* translocated substrates. *Cell Microbiol* 13:227-245.

**O'Connor TJ**, Adepoju Y, Boyd D, Isberg RR (2011) Minimization of the *Legionella pneumophila* genome reveals chromosomal regions involved in host range expansion. *Proc Natl Acad Sci* 108:14733-14740.

*Highlighted In:*

Faculty of 1000 Prime. Recommendation by Joanna Goldberg (Professor, Emory University School of Medicine), May, 2012.

Choy A, Dancourt J, Mugo B, **O'Connor TJ**, Isberg RR, Melia T, Roy CR (2012) Autophagy inhibition by irreversible deconjugation of Atg8 proteins from membranes. *Science* 338:1072-1076.

**O'Connor TJ**, Boyd D, Dorer M, Isberg RR (2012) Aggravating genetic interactions allow a solution to redundancy in a bacterial pathogen. *Science* 338:1440-1444.

*Highlighted In:*

Faculty of 1000 Prime. Recommendation for Special Significance by Heidi Goodwich-Blair (Professor, University of Wisconsin), May, 2013.

American Society for Microbiology, Small things considered (<http://schaechter.asmblog.org>). Putting redundancy to work by Katrina Nguyen, April, 2013.

BioTechniques. What a Pathogen Needs by Rachael Moeller Gorman, December, 2012.

De Jesus DA, **O'Connor TJ**, Isberg RR (2013) Analysis of *Legionella* infection using RNA interference in *Drosophila* cells. *Methods Mol Biol* 954:251-264.

**O'Connor TJ**, Isberg RR (2014) iMAD: a genetic screening strategy to dissect complex interaction between a pathogen and its host. *Nature Protocols*. 9:1916-1930.

**O'Connor TJ**, Zheng H, VanRheenen SM, Ghosh S, Cianciotto NP, Isberg RR (2016) Iron triggers early egress by the intracellular bacterial pathogen *Legionella pneumophila*. *Infect Immun*. 84:2185-2197.

Ghosh S and **O'Connor TJ** (2017) Beyond paralogs: the multiple layers of redundancy in bacterial pathogenesis. *Front Cell Infect Microbiol*. 7:467.

Boamah DK, Zhou G, Ensminger AW, **O'Connor TJ** (2017) From many hosts, one accidental pathogen: the diverse protozoan hosts of *Legionella*. *Front Cell Infect Microbiol*. In press.

## Funding

### Current

#### Extramural Funding

1R21AI125810-01A1 O'Connor (PI) 7/1/2017 – 6/31/2019

NIH/NIAID

Title: An enabling technology to dissect critical molecular events in bacterial pathogenesis

1R01AI125402-01

O'Connor (PI)

7/1/2016 – 6/31/2020

NIH/NIAID

Title: Defining redundant strategies central to *Legionella* replication vacuole formation

HR0011-16-C-0139

O'Connor (co-I)

7/1/2016 – 6/31/2020

Department of Defense/DARPA

Title: Designing a pathogen-specific chemotactic network

### Completed

#### Extramural Funding

1R21AI119580-01 O'Connor (PI) 7/1/2015 – 6/31/2017

NIH/NIAID

Title: Identifying genes essential for *Legionella* persistence and transmission

#### Institutional Funding

Discovery Fund Innovation Award

O'Connor (PI)

8/1/2015 – 7/31/2016

Johns Hopkins University Pilot Grant

Title: An enabling technology to dissect critical molecular events in bacterial pathogenesis

## EDUCATIONAL ACTIVITIES

### Educational Publications

#### *Book Chapters*

1. O'Connor TJ, Heidtman M, Isberg RR. (2008) *Legionella: Molecular Biology*. Chapter 10: Mechanisms of Intracellular Survival and Replication of *Legionella pneumophila*. Caister Academic Press, Norfolk, UK.
2. De Jesus DA, O'Connor TJ, Isberg RR (2011) *Legionella: Methods and Protocols*. Chapter: Analysis of *Legionella* infection using RNA interference in *Drosophila* cells. Humana Press, New York, NY.

### Teaching

#### *Classroom Instruction*

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|-----------|--|
| 1998-1999 | Let's Talk Science, Instructor, McMaster University<br>Designed and performed biochemistry experiments for students at a local high school to foster scientific interest and answer questions regarding career opportunities in science. |
| 1998-2000 | Biochemistry Laboratory I, Teaching Assistant, McMaster University   |
| 2000-2002 | Nucleic Acid Structure and Function, Teaching Assistant, McMaster University   |
| 2002-2003 | Protein Structure and Function, Teaching Assistant, McMaster University  |
| 2003-2004 | Cellular Biochemistry, Teaching Assistant, McMaster University   |
| 2013-2014 | Topics in Interdisciplinary Medicine - Infectious Disease Intersession on Antimicrobial Resistance, Instructor, Johns Hopkins School of Medicine   |
| 2013-2017 | Current Topics in Biological Chemistry, Instructor, Johns Hopkins University School of Medicine  |
| 2015-2016 | Bacterial Cell and Developmental Biology, Instructor, Johns Hopkins School of Medicine   |
| 2016-2017 | Bacterial Communication and Warfare, Instructor, Johns Hopkins School of Medicine  |
| 2017-2018 | Microbial Pathogenesis, Instructor, Johns Hopkins School of Medicine   |

#### *Workshops/Seminars*

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|------|---|
| 2015 | Women Serious about Science Seminar, Baltimore Polytech High School |
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## ORGANIZATIONAL ACTIVITIES

### Institutional Administrative Appointments

- |       |   |
|-------|---|
| 2015- | Chair, Department of Biological Chemistry Seminar Series Committee, Johns Hopkins School of Medicine          |
| 2015  | Member, Lehninger Seminar Series Committee, Johns Hopkins School of Medicine                                  |
| 2016- | Co-Chair, Department of Biological Chemistry Departmental Retreat Committee, Johns Hopkins School of Medicine |
| 2017- | Co-Founder, Bug Super Group, Johns Hopkins University   |

### Advisory Committees, Review Groups/Study Sections

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|-----------|---|
| 2000-2001 | Member, Seminar Series Review Committee, McMaster University  |
| 2013-     | Member, Biological Chemistry Graduate Program Admissions Committee, Department of Biological Chemistry, Johns Hopkins University School of Medicine   |
| 2012-     | <i>Ad Hoc</i> Reviewer for Scientific Journal: <i>Proc Natl Acad Sci USA</i> , <i>PLoS Pathogens</i> , <i>Pathogens and Disease</i> , <i>PLoS One</i> , <i>Nature Communications</i> , <i>Frontiers in Cell and Infection Microbiology</i> , <i>Virulence</i> . |
| 2015-2016 | <i>Ad Hoc</i> Reviewer, French National Research Agency Study of the defense mechanisms of the body: Host-pathogen Interactions (Axis 8, Challenge 4) Study Section   |
| 2015-2016 | <i>Ad Hoc</i> Reviewer, Johns Hopkins University IBBS Bridging Award Committee  |
| 2015-2016 | <i>Ad Hoc</i> Reviewer, Faculty Search Committee, Department of Molecular Microbiology and Immunology, Johns Hopkins University School of Public Health   |

- 2015-2016 *Ad Hoc* Reviewer, Newton International Fellowships (Postdoctoral Fellowships), Newton Fund, United Kingdom.
- 2016- Faculty Advisor, National Organization of the Society for the Advancement of Hispanic/Chicanos and Native Americans in Science (SACNAS) Johns Hopkins University-University of Maryland, Baltimore (Hopkins-UMB) Chapter
- 2017-2018 *Ad-hoc* Reviewer, Polish National Science Center, Molecular Biology, Structural Biology and Biotechnology (NZ1) Study Section
- 2017-2018 Reviewer, National Institutes of Health, Topics in Bacterial Pathogenesis (IDM-B) Study Section
- 2017-2018 *Ad Hoc* Reviewer, Provost's Undergraduate Research Award (PURA), Johns Hopkins University

### Professional Societies

- 2007- American Society for Microbiology
- 2015- American Society for Biochemistry and Molecular Biology

### RECOGNITION

#### Awards and Honors

- 1994-1995 McDonald's Restaurants Inc. Scholarship, Scholarship
- 1994-1998 Graduation with Distinction, Honors for high academic achievement, McMaster University
- 2000-2001 Karl Freeman Award for Outstanding Seminar, McMaster University
- 2003-2004 McMaster University Research Travel Award, McMaster University
- 2009-2011 Natalie V. Zucker Research Center for Women Scholars
- 2014-2015 Institutional Nomination for the Edward Mallinckrodt Jr. Award, Johns Hopkins University School of Medicine
- 2014-2015 Institutional Nomination for the Outstanding New Environmental Scientist Award, Johns Hopkins University School of Medicine
- 2014-2015 Johns Hopkins University Discovery Fund Innovation Award
- 2016-2017 Nomination for the Merck/ICCAC Young Investigator Award in Microbiology and Infectious Disease by Dr. Ralph Isberg, Howard Hughes Medical Institute Investigator, Professor, Department of Molecular Biology and Microbiology, Tufts University School of Medicine

#### Invited Seminars

##### *Conferences and Symposia Seminars*

- 2003 The role of the response regulator RamR in mediating morphological differentiation in *Streptomyces coelicolor*. McMaster University: University of Toronto Bug Fest Seminar Series, McMaster University, Hamilton, Ontario, Canada.
- 2003 The functional role of the developmental regulator RamR in the multicellular bacterium *Streptomyces coelicolor*. Molecular Genetics of Bacteria and Phages. University of Wisconsin, Madison, Wisconsin, USA.
- 2004 RamR: a regulator of morphological differentiation in the multicellular bacterium *Streptomyces coelicolor*. McMaster University: University of Toronto Bug Fest Seminar Series, Sunnybrook Hospital, Toronto, Ontario, Canada.
- 2009 Solving functional redundancy amongst Dot/Icm translocated substrates of *Legionella pneumophila*. *Legionella* 2009. Pasteur Institute, Paris, France.
- 2009 Solving functional redundancy amongst effectors of the bacterial pathogen, *Legionella pneumophila*. Microbial Pathogenesis and Host Response. Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, NY, USA.
- 2013 Solving redundancy in a bacterial pathogen using iMAD, a novel strategy for dissecting complex interaction. In vitro Biology Meeting. Providence, Rhode Island, USA.

### *Institutional and Departmental Seminar Series*

- 2011 Department of Microbiology, University of Texas, Southwestern, Dallas, TX.
- 2011 Department of Molecular Genetics, University of Toronto, Toronto, ON.
- 2012 Department of Biological Sciences, University of Maryland, Baltimore County, Baltimore, MD.
- 2012 Department of Biological Sciences, University of Arkansas, Fayetteville, AR.
- 2012 Department of Molecular Genetics, Pennsylvania State University, College Park, PA.
- 2012 Department of Microbial and Molecular Pathogenesis, University of Texas A&M, Bryant, TX.
- 2012 Division of Biology, Kansas State University, Manhattan, KS.
- 2013 Department of Microbiology, Immunology and Molecular Genetics, University of Kentucky School of Medicine, Lexington, KY.
- 2013 Department of Microbiology and Immunology, University of California, San Francisco School of Medicine, San Francisco, CA.
- 2013 Biology Department, Boston College, Boston, MA.
- 2013 Department of Biological Chemistry, Johns Hopkins University School of Medicine, Baltimore, MD.
- 2013 Department of Biological Sciences, University of Pittsburgh, Pittsburgh, PA.
- 2013 Department of Molecular Microbiology, Washington University School of Medicine, St. Louis, MI.
- 2013 Department of Pathology, Microbiology and Immunology, Vanderbilt University Medical Center, Nashville, TN.
- 2013 Department of Biology, Georgetown University, Washington, DC.
- 2013 Center for Genomics and Systems Biology, Department of Biology, New York University, New York, NY.
- 2013 Department of Biology, Washington University, St. Louis, MI.
- 2013 Department of Microbiology, Cornell University, Weill Institute for Cell and Molecular Biology, Ithaca, NY.
- 2013 Department of Microbiology and Immunology, Stanford University, Stanford, CA.
- 2013 Department of Microbiology and Immunology, University of Maryland School of Medicine, Baltimore, MD.
- 2013 Department of Cell Biology, Johns Hopkins University School of Medicine, Baltimore, MD.
- 2013 Lambda Lecture Series, National Institute of Health, Bethesda, MD.
- 2014 Microbial Pathogenesis Interest Group, Department of Pediatric Infectious Diseases, Johns Hopkins School of Medicine, Baltimore, MD
- 2016 Department of Clinical Science, College of Veterinary Medicine, North Carolina State University, Raleigh, NC.
- 2016 Department of Biochemistry and Biophysics, Texas A&M University, College Station, TX.
- 2016 Prokaryotic Seminar Series, University of Pennsylvania, Philadelphia, PA.
- 2017 Department of Biological Sciences, University of Delaware, Newark, DE.

### *Conferences and Symposia Abstracts*

- O'Connor, TJ**, Kanellis, P and Nodwell, J. The *ramC* gene is required for morphological development in *Streptomyces coelicolor* and expressed in a cell type specific manner under the direct control of RamR. Antimicrobial Research Centre Symposium. McMaster University, Hamilton, Ontario, April, 2002.
- O'Connor, TJ** and Nodwell, J. A signaling mechanism that establishes cell type specific gene expression in *Streptomyces coelicolor*. Molecular Genetics of Bacteria and Phages. University of Wisconsin, Madison, Wisconsin, August, 2003.
- O'Connor, TJ** and Nodwell, J. Establishing cell fate in the multicellular bacterium *Streptomyces coelicolor*. Antimicrobial Research Centre Symposium. Sheraton on the Falls, Niagara Falls, Ontario, April, 2004.
- O'Connor, TJ** and Nodwell, J. Establishing cell fate in the multicellular bacterium *Streptomyces coelicolor*. American Society for Microbiology Conference on Cell-Cell Communication in Bacteria. The Banff Center, Banff, Alberta, July, 2004.
- O'Connor, TJ**, Adepoju, Y, Boyd, D and Isberg, RR. Identifying Sources of Functional redundancy amongst secreted effector proteins employed by the bacterial pathogen *Legionella pneumophila* during infection.

American Society for Microbiology 108<sup>th</sup> General Meeting. The Boston Convention and Exhibition Center, Boston, Massachusetts, June, 2008.

**O'Connor, TJ**, Adepoju, Y, Boyd, D and Isberg, RR. Identifying sources of functional redundancy amongst Type IV secreted substrates of the bacterial pathogen *Legionella pneumophila*. Gordon Conference: Microbial Pathogenesis. Waterville Valley Resort, Waterville Valley, NH. July, 2010.

**O'Connor, TJ**, Adepoju, Y, Boyd, D and Isberg, RR. Genome minimization of the *Legionella pneumophila* genome reveals genomic islands involved in host range expansion. Microbial Pathogenesis and Host Response. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY. September, 2011.

**O'Connor, TJ**, Anjuwon-Foster B, Davis, K and Isberg RR. *Legionella* virulence strategies that promote persistence in environmental reservoirs and transmission to humans. Gordon Conference: Microbial Pathogenesis. Waterville Valley Resort, Waterville Valley, NH. July, 2014

**O'Connor, TJ**, Zheng, H, VanRheenen, S, Cianciotto, N and Isberg RR. Iron limitation triggers growth arrest and early egress by an intracellular bacterial pathogen. Microbial Pathogenesis and Host Response. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY. September, 2015.

### *Panels*

2013-2015      Research Leadership for Postdoctoral Fellows Discussion Group, Panelist, Johns Hopkins University School of Medicine

2014-2015      Graduate Student Association Investigators' Reflection Lecture, Panelist, Johns Hopkins University School of Medicine

## **OTHER PROFESSIONAL ACTIVITIES**

### *Committees*

1998-1999      Events Committee, McMaster University

2013-2017      Judge, Biochemistry, Cell and Molecular Biology Graduate Program Student Retreat Poster Session Award Committee, Johns Hopkins University School of Medicine

2016-2017      Judge, Graduate Student Association Poster Session

### *Sponsored Research*

2015-2017      Sponsor, Summer Undergraduate Internship Program (SIP), Johns Hopkins University

2016-2018      Sponsor, Post-baccalaureate Research Education Program (PREP), Johns Hopkins University

2016-2017      Sponsor, Summer Academic Research Experience (SARE) Program, Johns Hopkins University

2017-2018      Sponsor, Undergraduate Research Internships, Weinberg College of Arts and Sciences, Northwestern University

### *Conferences*

2013-2014      Conference Participant, Microbial Pathogenesis and Host Response, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, September, 2013

2013-2014      Conference Participant, American Society for Microbiology 114<sup>th</sup> General Meeting. The Boston Convention and Exhibition Center, Boston, Massachusetts, May, 2014.