

Curriculum vitae

GARY E. WARD

Department of Microbiology and Molecular Genetics
316 Stafford Hall, 95 Carrigan Drive
University of Vermont Lerner College of Medicine
Burlington, VT 05405 USA
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EDUCATION

1979-1985 Ph.D., Marine Biology
 Laboratory of Dr. Victor D. Vacquier
 University of California at San Diego

1981 Physiology Course
 Marine Biological Laboratory (Woods Hole, MA)

1975-1979 B.Sc. (Honors), Biophysics
 University of New Brunswick, Fredericton

ACADEMIC APPOINTMENTS

2014 Visiting Scientist
 Wellcome Center for Tropical Medicine and Parasitology
 University of Glasgow

2007- present Professor
2002-2007 Associate Professor
1996-2002 Assistant Professor
 Department of Microbiology and Molecular Genetics
 University of Vermont Lerner College of Medicine

1989-1996 Senior Staff Fellow
 Laboratory of Parasitic Diseases
 National Institute of Allergy and Infectious Diseases
 National Institutes of Health, Bethesda MD

1985-1989 Postdoctoral fellow
 Laboratory of Dr. Marc W. Kirschner
 Department of Biochemistry and Biophysics
 University of California at San Francisco

HONORS

2021 Director's Award, Cellular, Molecular and Biomedical Sciences
 Program

2019	Named UVM “Open Access Champion” by the UVM Dean of Libraries
2011-12	University Scholar, University of Vermont
2009-present	Member, Vermont Academy of Science and Engineering
2001-2004	Burroughs Wellcome New Investigator in Molecular Parasitology (University of Vermont)
1985-1988	Jane Coffin Childs Postdoctoral Fellowship (University of California, San Francisco)
1986	Martin D. Kamen Prize for Graduate Research in Biological Chemistry (University of California, San Diego)
1979-1983	Postgraduate Fellowship, Natural Sciences and Engineering Research Council of Canada (University of California, San Diego)
1979	Governor General of Canada Gold Medal (University of New Brunswick)

SERVICE

Dissertation/studies committees (1996-2022)

Alia Merla, Tammy Richman, John Rose, Rebecca Guy, Carolyn Donahue, Michael Wichroski, Kimberly Carey, Stacey Gilk, Dominic Lambert, Jeffrey Mital, Melissa Batonick, Karen Cole, Sandhya Khurana, Chunxiao Yu, Jamie Carter, Belinda Thompson, Jayanthi Garudathri, Ben Stark, Aoife Heaslip, Luke Tilley, Qing Tang, Whitney Barkhuff, Jacqueline Leung, Anahi Fernandez Cuppari, Heng Guo, Annette LaBauve, John Midkiff, Kovi Bessoff, Shruthi Krishnamurthy, Jenna Foderaro, Dario Lirussi, Meghan Owens (MMG)

Irene Rainville, Tim Trott, Danielle Vitiello, Wade Bell, Charles Johnson, Aoife Heaslip Pam Lescault, Dimitry Krementsov, Brad Heron, Ying Ruan, Brent Osborne, Joe Klaus, Adam Sateriale, Benjamin King, Rajiv Jumani, Md Mahmudul Hasan Alvee, Hannah Naughton, Alex Thompson, Katy Svec, Katie Queen, Bethany Mihavics, Ethan Mattice, Lea Drogalis, Alicia Finney (Cellular, Molecular, and Biomedical Sciences [CMB])

Tiebin Wang (Bioengineering)

Tom Sladewski (Molecular Physiology and Biophysics)

Jackie Teriele, Ying Ruan (Pharmacology)

Susan Perkins, Rebecca Eisen, J.J. Herlihy (M.Sc.), Anne Yezerski, Suchismita Chandran Shyamal Weeraratne (Biology)

Yan Liang, Giovanna Sassi, Yucan Zhang, Prince Zogli, Connor Lewis (Plant Biology)

Amy Noe (Notre Dame University)

Alexia Belperron (Dartmouth College)

Ke Hu (University of Pennsylvania)

Undergraduate Honors Thesis committees

Cathryn Koptiuch, Allison Neal, Katherine St. Denis (Biology)

Briana Leger, Mehul Shah (MMG)

Departmental/Program service

2020-present	MMG Reappointment, Promotion and Tenure Committee (Chair)
2019-2020	MMG/TGIR Faculty Search Committee
2019-present	MMG Research Committee
2019	MMG Undergraduate Education Committee
2018-2019	MMG Graduate and Medical Education Committee (Chair)
2015-present	CMB Program Graduate Recruitment and Admissions Committee
2015	Norman R. Alpert Research Prize selection committee
2001-2018	MMG Reappointment, Promotion and Tenure Committee
2012-2013	MMG Departmental Administrator Search Committee
2003-2004	MMG Research Committee
2002-2003	MMG Website Design Committee (Chair)
2002-2003	MMG Cellular Microbiology Search Committee (Chair)
2000-2016	MMG Graduate Policy Committee
2000	MMG Genetics Faculty Search Committee
2000	MMG Curriculum Redesign Committee
1998-2003	MMG Annual Retreat Organizing Committee (Chair, 1998-2000)
1998-1999	MMG Virology Search Committee
1998	Director , MMG summer undergraduate fellowship program
1997	MMG Cumulative Exam Committees: Cell Biology/Development, Microbiology
1996-2011	MMG Graduate Admissions and Recruitment Committee (co-Chair, 2000 - 2011)

College of Medicine service

2018-present	Medical Curriculum Committee
2017	MMG Structure and Funding Review Committee
2016-present	Vermont Immunobiology and Infectious Disease T32 Predoctoral Training Program, Director (co-Director 2016-2020)
2016-present	Research Incentives Working Group
2015-2016	Medical Curriculum Committee
2011-2013	Vermont Immunobiology and Infectious Disease Center, Mucosal Immunologist Faculty Search Committee
2010-2012	Graduate Education Committee
2008-2009	Search Committee, COM Associate Dean for Research
2008-2010	Department of Molecular Physiology and Biophysics, Cell Biologist/Biophysicist Faculty Search Committee
2008-2009	Vermont Immunobiology and Infectious Disease Center, Faculty Search Committee, Chair

2006-2010	Vermont Immunobiology and Infectious Diseases Center Proteomics Core, co-Director (Protein Isolation and Separation)
2006-2007	Vermont Immunobiology and Infectious Disease Center, Faculty Search Committee, co-Chair
2006	Committee on Fitness (ad hoc, 11/06)
2005-2011	Committee on Advancement
2003-2004	Vermont Integrated Curriculum, Cell and Molecular Biology Steering Committee
2001-2003	Vermont Integrated Curriculum, Cell and Molecular Biology Design Committee
1999	Vermont Integrated Curriculum, Leadership Theme Subgroup (4/15/99-6/30/99)
1998-2002	Vermont Integrated Curriculum Assessment Subcommittee

College of Agriculture and Life Sciences service

2021	Faculty Search Committee, Department of Animal and Veterinary Sciences
2018	Bickford Endowed Professorship Selection Committee
2017-2020	CALS Faculty Standards Committee, co-Chair
2014	2015 CALS Alumni Awards Selection Committee
2001-2003	CALS representative, Faculty Senate Nominating Committee
2000-2001	Faculty Search Committee, Department of Nutrition and Food Sciences, Biomolecular Nutritionist

University service

2019-present	Library Faculty Advisory Committee
2016-2017	Faculty Search Committee, Medical Laboratory and Radiation Science
2016	REACH grant reviewer
2015-present	Cell, Molecular and Biomedical Sciences Program, Recruitment and Admissions Committee
2015, 2016, 2019	University Scholar Selection Committee, Basic and Applied Science
2010-present	Scholarly Communication Committee
2004, 2008	McNair Scholar Selection Committee / Interviewer
2000-2010	Institutional Biosafety Committee
2002-2010	Institutional Biosafety Committee, Infectious Agents Subcommittee
1997	Judge, Graduate and Medical Student Research Forum

National/International service

2019-present	University of New Hampshire "UP-2-NIH" program, External Mentor
2020	NIH CSR Aging and Development Special Emphasis Review Panel 2021/01 ZRG1 CB-L (02) M

2019	NIH CSR Dual Purpose – Dual Benefit Review Panel ZRG1 IDM-N (50) R, PAR-16-366
2019-present	Vice-chair, “Biology of Host-Parasite Interactions” Gordon Conference (Chair 2022-2024)
2016-present	Clemson University Eukaryotic Pathogens Innovations Center, COBRE External Advisory Committee
2015	NIH CSR AIDS and Related Research Special Emphasis Review Panel ZRG1 AARR-K(03)
2015	NIH CSR AIDS and Related Research Special Emphasis Review Panel ZRG1 AARR-K(02)
2015-2018	International Scientific Advisory Board, Wellcome Trust Center for Molecular Parasitology (Glasgow)
2013-2018	PubMed Commons External Working Group, National Center for Biotechnology Information
2013	NIH CSR AIDS and Related Research Special Emphasis Review Panel ZRG1 AARR-E 02M
2012	NIH CSR Parasites and Insect Vectors Special Emphasis Review Panel ZRG1 IDM-B 02M
2011-2018	Public Library of Science, Board of Directors (Chair, 2011-2018); Finance Committee (2011-2018); Nominations Committee (Chair, 2011-2017); Editorial Advisory Committee (2013-2018); CEO Search Committees (Chair, 2013 & 2017)
2010	NIH EuPathDB Bioinformatics Resource Center, Driving Biological Projects (DBP) Review Panel (5/10)
2007-2011	PubMed Central National Advisory Board, National Library of Medicine (Chair, 2009-2011)
2006	NIH Pathogenic Eukaryotes (PTHE) Study Section (6/06)
2006	NIH CSR Special Emphasis Review Panel ZRG1 BCMB-Q (90) (S)
2005-2006	Public Access Working Group, National Library of Medicine
2005	Executive Director Search Committee, American Society for Cell Biology
2002-2008	Treasurer (elected) and member of the Executive Committee, American Society for Cell Biology
2002-2003	Annual Meeting Site Selection Committee, American Society for Cell Biology (2002-2003)
2000	NIH CSR Special Emphasis Review Panel ZRG1 AARR-1
1998-2000	Finance Committee, Federation of American Societies for Experimental Biology
1996-2008	Finance and Audit Committee, American Society for Cell Biology (Chair, 2002-2008)

UNIVERSITY AFFILIATIONS

Cellular, Molecular, and Biomedical Sciences Program

Graduate College

Vermont Immunobiology and Infectious Diseases Center

Vermont Immunobiology and Infectious Diseases T32 predoctoral training program

TEACHING/MENTORING

Postdoctoral fellows supervised:

Jeralyn Haraldsen (2004-2008)

Fabiola Parussini (2006-2011)

Pramod Rompikuntal (2013-2017)

Robyn Kent (2017 – present) *American Heart Association postdoctoral fellow

Graduate students supervised:

Carolyn Donahue (Ph.D student, 1996-2002) –postdoctoral fellowship at University of California, San Francisco; currently Associate Director, Product Development, at Illumina, San Diego CA

Michael Wichroski (Ph.D student, 1997-2003) – postdoctoral fellowship at University of Massachusetts Medical School, Worcester; currently Director, Oncology Discovery Biology Group at Bristol-Myers Squibb, Wallingford CT

Kimberly Carey (Ph.D student, 1998-2004) –postdoctoral fellowship at Yale University; currently Senior Research Scientist at the Broad Institute, Boston MA

Stacey Gilk (Ph.D student, 1998-2004) – postdoctoral fellowship at University of North Carolina; postdoctoral fellowship at Rocky Mountain Laboratories, NIH; currently Associate Professor of Pathology and Microbiology, University of Nebraska Medical Center, Omaha NE

Jeffrey Mital (PhD student, 2001-2006) – postdoctoral fellowship at Rocky Mountain Laboratories, NIH; currently Associate Professor of Biomedical Sciences at Quinnipiac University, Hamden CT

Jayanthi Garudathri (MS student 2004-2007) – currently Research Scientist II, University of Washington, Seattle WA

Aoife Heaslip (PhD student, 2003-2008) – postdoctoral fellowship at Indiana University, Bloomington IN; postdoctoral fellowship in the Department of Molecular Physiology and Biophysics, University of Vermont; currently Assistant Professor in the Department of Molecular and Cell Biology at University of Connecticut

Whittney Barkhuff (MD/PhD student, 2005-2008) – Residency and fellowship in the Division of Neonatology, Department of Pediatrics, University of New Mexico, Albuquerque NM; currently Assistant Professor of Pediatrics at University of Vermont Larner College of Medicine

Qing Tang (PhD student, 2006-2013) –postdoctoral fellowship in the Department of Molecular Physiology and Biophysics, University of Vermont; currently postdoctoral fellowship at Brandeis University (Waltham MA)

Anahi Odell (PhD student, 2008-2013) – currently a full-time parent in New Haven CT

Jacqueline Leung (PhD student, 2008-2013) – postdoctoral fellowship in the Department of Biology, Indiana University, Bloomington IN; currently Confocal Microscopy Specialist, NIH/NIAID Rocky Mountain Laboratories

Luke Tilley (PhD student, 2007-2013) – postdoctoral fellowship in the Whitehead Institute, Massachusetts Institute of Technology, Boston MA; Infectious Disease Scientist, Sarepta Therapeutics, Boston MA; currently Senior Project Manager, Dicerna Pharmaceuticals, Boston MA

Shruthi Krishnamurthy (PhD student, 2010-2015) – postdoctoral fellowship in the Dept. of Pathology, Microbiology and Immunology, University of California, Davis CA; currently Technology Transfer Specialist, Mass General Brigham, Boston MA

Jenna Foderaro (PhD student, 2011-2017) – currently a postdoctoral fellow at The Research Foundation for SUNY at Stony Brook University, Stony Brook NY

Rachel Stadler (PhD student, 2017- present) *American Heart Association and NRSA F31 predoctoral fellow – currently a Malaria Research Program Collaborative Postdoctoral Fellow at NIH

Frances Male (PhD student, 2018- present)

Anne Snyder (PhD student, 2020 - present)

Undergraduate students supervised:

Cathryn Koptiuch (Honors thesis; 2008-2009)

Phoebe Cole (2009-2010)

Audrey Woods (2011)

Mac Stannard (2015-2016)

Nora Cleary (2016-2018)

Erik Flynn (2017-2019)

Mehul Shah (2018-2021) *awarded the 2020 Alexander Kende Academic Merit Award and the 2021 Lucille P. Markey Outstanding Senior in Molecular Genetics Award.

Courses taught (medical):

Foundations of Clinical Sciences, Vermont Integrated Medical Curriculum (Fall 2003, 2004, 2006-22). **Steering Committee Member (2003)**. Foundations level survey course for medical students on the fundamentals of cell and molecular biology. 120 students. 9 hr lecture/workshops; 12 hr small group discussions (facilitator).

Courses taught (graduate):

CLBI 301, "Cell Biology" (Fall 2003, 2005-2017, Spring 2018-22). Graduate level cell biology survey course examining biology at the cellular level. 50 students. 13.5 hours lecture out of 42 total.

CLBI 401, "Critical Reading and Analysis" (Spring 2018-22). Graduate level course running concurrently with CLBI 301, utilizing exclusively primary scientific literature & an active, discussion-based approach to provide intensive study in the logic, critical thinking, and experimental design & interpretation that govern the theory and practice of investigating biology at the cellular level. 10 hours out of 30 total.

MMG 296E, "Grant Writing" (Spring 2012). **Co-developed and co-directed** this graduate level course in grant-writing for MMG students. 6 students. Participated in all sessions (12.5 hr total), and in grading of final proposals.

MMG 310, "Biological Noise" (Fall 2011). **Course director.** Graduate level seminar course on the role of stochasticity and noise in biological systems; strong emphasis on developing students' presentation skills. 2 post-docs and 5 students, from MMG, CMB. 17.5 hours class time out of 17.5 total.

MMG 310, "Cellular and Molecular Mechanisms of Human Disease" (Fall 1998). **Course director.** Graduate level seminar course on the cellular and molecular mechanisms of human disease; strong emphasis on developing students' presentation skills. 10 students, from MMG and CMB. 15 hours class time out of 15 total.

MMG 310, "Post-Genomic Biology" (Fall 2006). **Course director.** Graduate level seminar course on post-genomic experimental biology; strong emphasis on developing students' presentation skills. 9 students, from MMG, CMB and Biology. 15 hours class time out of 15 total.

MMG 320, "Cellular Microbiology" (formerly *MMG 296 - Microbial Pathogenesis*; Spring, 1999, 2002, 2004, 2006, 2008, 2010, 2013, 2015, 2017, 2019, 2021). **Course director.** 4-credit graduate level course on the pathogenic mechanisms of viruses, bacteria and parasitic protozoa. 5-12 students, from MMG, CMB, and Biology. 22.5 hours lecture, 8 hours debate/journal club out of 55 hours total. Introduced student Wikipedia projects, debates, group exam question preparation to promote collaborative and active learning.

MMG 332, "Critical Reading" (Fall 1996, 1999-2001, 2003, 2005, 2006, 2008-10). Graduate level class aimed at developing students' critical reading skills. 7-10 students, from MMG and CMB. 1.5 hours class time out of 21 total.

ANNB 327 "Being a Scientist: Responsible Conduct in Research" (Spring 2006-2022). A discussion course for graduate students, post-doctoral fellows and new faculty, exploring issues relating to the responsible conduct of research. Approx. 20 students (registered and audits); 1.5 hr lecture out of 21 total.

MPBP 310 "Molecular Basis of Biological Motility" (Spring 2008, 2009). Graduate level, literature-based course examining the molecular basis of cellular motility. 8 students, from MMG, CMB and MPBP; 1.5 hr lecture out of 24 total

Courses taught (undergraduate):

MMG 101, "Biology of Microorganisms" (Fall 1999-2003). Undergraduate

introductory microbiology course. 65-70 students, primarily from MMG, Animal Sciences, and Biological Sciences. 3 hours lecture out of 38 total.

MMG 102, "Molecular Genetics" (Spring 2001-2004). Undergraduate eukaryotic genetics/cell biology course. 15-25 students, primarily from MMG. 9 hours lecture out of 39 total.

MMG 001, "First Year Colloquium" (Fall 2005, 2007, 2010, 2015). Introduction to research topics within MMG, for MMG majors. 6-10 students, 1 hr lecture or lab demonstration out of 10 total.

Courses taught (other):

Biology of Parasitism (Woods Hole MA; 2007, 2009, 2010). Graduate level lecture and lab course on the molecular and cellular biology of parasitism. 16 students.

Lecturer (1997, 2001, 2003-2006, 2018-19, 2021-22). 5 hr guest lecture.

Laboratory module director (2007, 2009, 2010). Two-week intensive laboratory module. Approximately 140 hr contact time in the laboratory.

Course co-director (2014-2017).

New Developments in Western Blotting: Quantitation, Dual Detection and More (2013). **Co-director.** Theoretical and hands-on workshop for graduate students. 8 students, 3 hr contact time.

UVM Dana Library Workshop Series: From Funding to Publishing (2010). Career development course for graduate students and postdocs on scientific databases, presentation and publication. 25 students. 2 hr contact time out of 12 total.

BI 330 (Middlebury College; 1998) "*Mechanisms of Microbial Pathogenesis*". Upper level undergraduate course on the mechanisms of microbial pathogenesis, directed by Dr. Grace Spatafora. 12 students. 1.5 hour guest lecture.

BPH 212 (Harvard School of Public Health, 2002) "*Molecular and Cellular Parasitology*". Graduate level course on molecular/cellular parasitology directed by Barbara Burleigh. 10 students. 2 hour guest lecture.

M/I 148 (Dartmouth Medical School, 2001, 2003) "*Molecular Pathogenesis*". Graduate level course on the mechanisms of microbial pathogenesis, directed by David Bzik and Ambrose Cheung. 8 students. 3 hour guest lecture/discussion session.

PROFESSIONAL SOCIETIES

American Society for Cell Biology (1980-present)

American Society for Tropical Medicine and Hygiene (1989-2002)

American Society for Microbiology (2003-present)

EDITORIAL BOARDS

PLoS Biology (2003-present)

Eukaryotic Cell (2007-2012)

GRANT SUPPORT - Active

NIH, R01 AI139201 (P.I.)

12/15/2018-11/30/2023

Multiscale analysis of MyosinA-based motility in Toxoplasma gondii

NIH, U01 AI169067 (P.I.)

01/03/2023-12/31/2027

Host cell membrane perforation during invasion by Toxoplasma gondii

T32 AI055402 (P.I.)

09/01/2021-08/31/26

Vermont Immunobiology/Infectious Disease Training Grant

Vermont Center for Immunobiology and Infectious Disease COBRE Pilot Award (P.I.)

06/01/18-07/01/23

Mechanisms underlying reactivation of Toxoplasma gondii chronic infection

PUBLICATIONS (*Indicates co-corresponding authors, **indicates Preprint)

Shortt, E., Hackett, C.G., Stadler, R.V., **Ward, G.E.**, Lourido, S. (2022) CDPK2A and CDPK1 form a signaling module upstream of *Toxoplasma* motility. **bioRxiv 2022.07.19.500742; doi: <https://doi.org/10.1101/2022.07.19.500742>

Kelsen, A., Kent, R.S., Snyder, A.K., Wehri, E., Bishop, S.J., Stadler, R.V., Powell, C., Martorelli di Genova, B., Rompikuntal, P.K., Boulanger, M.J., Warshaw, D.M., Westwood, N.J., Schaletzky, J., **Ward, G.E.** (2022) The class XIV myosin of *Toxoplasma gondii*, TgMyoA, is druggable in an animal model of infection. **bioRxiv 2022.09.09.507210; doi: <https://doi.org/10.1101/2022.09.09.507210>.

Stadler, R.V., Nelson, S.R., Warshaw, D.M., **Ward, G.E.** (2022) A circular zone of attachment to the extracellular matrix provides directionality to the motility of *Toxoplasma gondii* in 3D. *eLife* 11:e85171.

**First posted a bioRxiv preprint at: doi.org/10.1101/2022.06.08.495400.

Tran, F., Foderaro, J., Westwood, N.J.*, **Ward, G.E.*** (2022) The potent *Toxoplasma gondii* growth inhibitor QQ-437 does not bind to its predicted target, parasite adaptin3 β , in yeast three-hybrid assays. **bioRxiv 2022.06.07.495217; doi: <https://doi.org/10.1101/2022.06.07.495217>

Rompikuntal P, Kent RS, Foe IT, Deng B, Bogyo M, **Ward GE.** (2021) Blocking palmitoylation of *Toxoplasma gondii* myosin light chain 1 disrupts glideosome composition but has little impact on parasite motility. *mSphere* 6: e00823-20. PMID: PMC8265671.

**First posted a bioRxiv preprint at: doi.org/10.1101/2020.08.13.250399.

Note: Preprint highlighted in PreLights 12/8/2020

Fazli, M.S., Stadler, R.V., Alaila, B.E., Vella, S.A., Moreno, S.N.J., **Ward, G.E.** and Quinn, S. (2019) Lightweight and Scalable Particle Tracking and Motion Clustering of 3D Cell Trajectories. 2019 IEEE International Conference on Data Science and Advanced Analytics. **arXiv:1908.03775v1 [cs.CV] 10 Aug 2019.

Hunt, A., Wagener, J., Kent, R., Carmeille, R., Russell, M., Peddie, C., Collinson, L., Heaslip, A., **Ward, G.E.**, Treeck, M. (2019). Differential requirements of cyclase associated protein (CAP) for actin turnover during the lytic cycle of *Toxoplasma gondii*. *eLife* 8: pii:350598. PMID: PMC6785269

**First posted as a bioRxiv preprint at: <https://doi.org/10.1101/569368>.

- Powell, C.J., Ramaswamy, R., Kelsen, A., Hamelin, D.J., Warshaw, D.M., Bosch, J., Burke, J.E., **Ward, G.E.**, and Boulanger, M.J. (2018). Structural and mechanistic insights into the function of the unconventional class-XIV myosin, MyoA, from *Toxoplasma gondii*. PNAS **115**: E10548-10555. PMID: PMC6233092
- Powell C.J., Jenkins M.L., Parker M.L., Ramaswamy R., Kelsen A., Warshaw D.M., **Ward G.E.**, Burke J.E., Boulanger M.J. (2017). Dissecting the molecular assembly of the *Toxoplasma gondii* MyoA motility complex. J Biol Chem **292**:19469-19477. PMID: PMC5702683.
- Gras, S., Jackson, A., Woods, S., Pall, G., Whitelaw, J., Leung, J.M., **Ward, G.E.**, Roberts, C.W., and Meissner, M. (2017) Parasites lacking the micronemal protein MIC2 are deficient in surface attachment and host cell egress, but remain virulent *in vivo*. Wellcome Open Res, **2**:32 (doi: 10.12688/wellcomeopenres.11594.1). PMID: PMC5473411.
**First posted as preprint: doi.org/10.12688/wellcomeopenres.11594.1
- Whitelaw, J.A., Latorre-Barragan, F., Gras, S., Pall, G.S., Leung, J.M., Heaslip, A., Egarter, S., Andenmatten, N., Nelson, S.R., Warshaw, D.M, **Ward, G.E.** and Meissner, M. (2017). Surface attachment, promoted by the actomyosin system of *Toxoplasma gondii* is important for efficient gliding motility and invasion. BMC Biology **15**: 1-23. PMID: PMC5242020
- Krishnamurthy, S.K., Deng, B., del Rio, R., Buchholz, K.R., Treck, M., Urban, S., Boothroyd, J., Lam, Y.-W., **Ward, G.E.** (2016). Not a simple tether: Binding of *Toxoplasma gondii* AMA1 to RON2 during invasion protects AMA1 from rhomboid-mediated cleavage and leads to dephosphorylation of its cytosolic tail. mBio **13**: e00754-16. PMID: PMC5021801
- Foe, I.T., Child, M.A, Majmudar, J.D., Krishnamurthy, S. van der Linden, W.A, **Ward, G.E.**, Martin, B. R and Bogyo, M. (2015) Global Analysis of Palmitoylated Proteins in *Toxoplasma gondii*. Cell Host & Microbe **18**, 501–511. PMID: 26468752
- Odell, A.V., Tran, F., Poupart, S., Pathak, R. Westwood, N.J.* and **Ward, G.E.*** (2015) Yeast three-hybrid screen identifies TgBRADIN as a novel negative regulator of *Toxoplasma gondii* bradyzoite differentiation. PLOS ONE **10**: e0120331. PMID: PMC4366382
- Bookwalter, C.S., Kelsen, A., Leung, J.M., **Ward, G.E.*** and Trybus, K.M.* (2014) A *Toxoplasma gondii* class XIV myosin, expressed in *Sf9* cells with a parasite co-chaperone, requires two light chains for fast motility. J Biol Chem **289**: 30832-30841. PMID: PMC4215259
- Tang, Q., Andenmatten, N., Hortua Triana, M.A., Deng, B., Meissner, M., Moreno, S.N.J, Ballif, B.A., **Ward, G.E.** (2014) Calcium-dependent phosphorylation alters Class XIVa myosin function in the protozoan parasite *Toxoplasma gondii*. Mol Biol Cell **25**: 2579-91. PMID: PMC4148248
- Leung, J.M., Tran, F, Pathak, R.B., Poupart, S., Heaslip, A.T., Ballif, B.A., Westwood, N.J.* and **Ward, G.E.*** (2014) Identification of *T. gondii* Myosin Light Chain-1 as a Direct Target of TachypleglinA-2, a Small-Molecule Inhibitor of Parasite Motility and Invasion. PLOS ONE **9**: e98056. PMID: PMC4043638
- Tilley, L.D., Krishnamurthy, S, Westwood, N.J. and **Ward, G.E.** (2014) Identification of TgCBAP, a novel cytoskeletal protein that localizes to three distinct subcompartments of the *Toxoplasma gondii* pellicle. PLOS ONE **9**: e98492. PMID: PMC4041824

- Bessoff K., Spangenberg T., Foderaro J.E., Jumani R.S., **Ward G.E.** and Huston C.D. (2014) Identification of *Cryptosporidium parvum* Active Chemical Series by Repurposing the Open Access Malaria Box. Antimicrob Agents Chemother. 201:2731-9. PMID: PMC3993250
- Leung, J.M., Rould, M.A., Konradt, C., Hunter, C.A., and **Ward, G.E.** (2014) Disruption of *TgPhIL1* alters specific parameters of *Toxoplasma gondii* motility measured in a quantitative, three-dimensional live motility assay PLOS ONE 9: e85763. PMID: PMC3906025
- Tran, F., Odell, A.V., **Ward, G.E.***, Westwood, N.J.* (2013) A Modular Approach to Triazole-Containing Chemical Inducers of Dimerisation for Yeast Three-Hybrid Screening. Molecules 18, 11639-11657. PMID: PMC4031444
- Parussini, F.P., Tang, Q., Moin, S.M., Mital, J.M., Urban, S.*, and **Ward, G.E.*** (2012) Intramembrane proteolysis of *Toxoplasma* Apical Membrane Antigen 1 facilitates host cell invasion but is dispensable for replication. Proc Natl Acad Sci U S A 109: 7463-8. PMID: PMC3358886.
- # Note: Highlighted in Faculty of 1000
- Dotzler Barkhuff, W.D., Gilk, S.D., Whitmarsh, R., Tilley, L.D., Hunter, C., **Ward, G.E.** (2011). Targeted Disruption of *TgPhIL1* in *Toxoplasma gondii* Results in Altered Parasite Morphology and Fitness. PLOS ONE 6: e23977. PMID: PMC3162014.
- Hall C.I., Reese M.L., Weerapana E., Child M.A., Bowyer P.W., Albrow V.E., Haraldsen J.D., Phillips M.R., Sandoval E.D., **Ward G.E.**, Cravatt B.F., Boothroyd J.C., Bogoy M. (2011) Chemical genetic screen identifies *Toxoplasma* DJ-1 as a regulator of parasite secretion, attachment, and invasion. Proc Natl Acad Sci U S A. 108:10568-73. PMID: PMC3127939.
- Sheiner, L., Santos, J.M, Klages, N., Parussini F., Jemmely, N., Friedrich, N., **Ward, G. E.**, Soldati-Favre, D. (2010) *Toxoplasma gondii* transmembrane microneme proteins and their modular design. Molec. Microbiol. 77: 912-929. PMID: PMC2982875.
- Heaslip, A.T., Carey, K.L., Catti, F., Warshaw, D.M., Westwood, N.J., Ballif, B.A., and **Ward G.E.** (2010) A small molecule inhibitor of *T. gondii* motility induces the posttranslational modification of myosin light chain-1 and inhibits myosin motor activity. PLOS Pathogens 6, e1000720. PMID: PMC2800044.
- Walton, J.G.A., Patterson, S. Liu, G., Haraldsen, J.D., Hollick, J.J., Slawin, A.M.Z., **Ward, G.E.**, and Westwood, N.J. (2009) Synthesis and Biological Evaluation of Functionalised Tetrahydro- β -carboline Analogues as Inhibitors of *Toxoplasma gondii* Invasion. Org. Biomol. Chem. 15, 3049-3060.
- Haraldsen, J.D., Liu, G., Botting, C.H., Walton, J.G.A., Storm, J., Phalen, T.J., Kwok, L.Y., Soldati-Favre, D., Heintz, N.H., Muller, S., Westwood*, N.J. and **Ward, G. E.*** (2009) Identification of conoidin A as a covalent inhibitor of peroxiredoxin II. Org. Biomol. Chem. 15, 3040-3048. PMID: PMC3043594.
- Gilk, S.D, Gaskins, E., **Ward, G.E.**, and Beckers, C.J.M. (2009) GAP45 phosphorylation controls assembly of the *Toxoplasma* myosin XIV complex. Euk. Cell 8, 190-196. PMID: PMC2643604.
- Kato, N., Sakata, T., Breton, G., Le Roch, K. G., Nagle, A., Andersen, C., Bursulaya, B., Henson, K., Johnson, J., Kumar, K. A., Marr, F., Mason, D., McNamara, C., Plouffe, D., Ramachandran, V., Spooner, M., Tuntland, T., Zhou, Y., Peters, E. C., Chatterjee, A., Schultz, P. G., **Ward, G. E.**, Gray, N., Harper, J., and Winzeler, E.A. (2008)

- Gene expression signatures and small-molecule compounds link a protein kinase to *Plasmodium falciparum* motility. Nat. Chem. Biol. **4**, 347-356.
- Evans, K.M., Haraldsen, J.D., Pearson, R.J., Slawin, A.M.Z, **Ward, G.E.** and Westwood, N.J. (2007) Synthesis and chemical characterisation of target identification reagents based on an inhibitor of human cell invasion by the parasite *Toxoplasma gondii*. Org. Biomol. Chem. **5**, 2063-2069.
- Morgan, R.E., Evans, K.M., Patterson, S., Catti, F. **Ward, G.E.**, and Westwood, N.J. (2007) Targeting Invasion and Egress: From tools to drugs? Curr Drug Targets **8**(1), 61-74.
- Brydges, S.D., Zhou, X.W., Hunyh, M., Harper, J.M., Mital, J., Ajoble, D., Daubener, W., **Ward, G.E.**, and Carruthers, V.B. (2006) Targeted Deletion of *MIC5* Enhances Trimming Proteolysis of *Toxoplasma* Invasion Proteins. Euk. Cell **5**, 2174-2183. PMID: PMC1694808
- Gilk, S.D., Raviv, Y., Hu, K., Murray, J.M., Beckers, C.J.M., and **Ward, G.E.** (2006) Identification of PhIL1, a novel cytoskeletal protein of the *Toxoplasma gondii* pellicle, through photosensitized labeling with [¹²⁵I]-5-Iodonaphthalene-1-azide (INA) Euk. Cell **5**: 1622-1634. PMID: PMC1595352
- Mital, J., Schwarz, J. Taatjes, D.J. and **Ward, G.E.** (2005) Laser Scanning Cytometer-based Assays for Measuring Host Cell Attachment and Invasion by the Human Pathogen, *Toxoplasma gondii*. Cytometry (Part A) **69A**:13-19. PMID: PMC1428790
- Alexander, D.L., Mital, J., **Ward, G.E.**, Bradley, P. and Boothroyd, J. (2005) Identification of the Moving Junction Complex of *Toxoplasma gondii*: A Collaboration Between Distinct Secretory Organelles. PLOS Pathogens **1**, 137-149. PMID: PMC1262624
- Mital, J, Meissner, M, Soldati, D. and **Ward, G.E.** (2005) Conditional expression of *Toxoplasma gondii* Apical Membrane Antigen-1 (TgAMA1) demonstrates that TgAMA1 plays a critical role in host cell invasion. Mol Biol. Cell, **16**, 4341-4349. PMID: PMC1196342
- Carey, K.L., Jongco, A., Kim, K. and **Ward, G.E.** (2004) The *Toxoplasma gondii* Rhoptyr Protein, ROP4, is Secreted into the Parasitophorous Vacuole and Becomes Phosphorylated in Infected Cells. Euk. Cell, **3**, 1320-30. PMID: PMC522600
- Gaskins, E., Gilk, S., DeVore, N., Mann, T., **Ward, G.** and Beckers, C.J. (2004) Identification of the Membrane Receptor of a Class XIV Myosin in *Toxoplasma gondii*. J. Cell Biol. **165**, 383-393. PMID: PMC2172186
- Carey, K.L., Westwood,* N.J., Mitchison, T.J., and **Ward, G.E.*** (2004) A Small-Molecule Approach to Studying Invasive Mechanisms of *Toxoplasma gondii*. PNAS **101**, 7433-7438. PMID: PMC409936
- Wichroski, M.J. and **Ward, G.E.** (2003) Biosynthesis of Glycosylphosphatidylinositol is Essential to the Survival of the Protozoan Parasite *Toxoplasma gondii*. Euk. Cell **2**, 1132-1136. PMID: PMC219362
- Ward, G.E.**, Carey, K.L. and Westwood, N.J. (2002) Using Small Molecules to Study Big Questions in Cellular Microbiology. Cell. Microbiol. **4**, 471-482.
- Wichroski, M.J., Melton, J., Donahue, C.G., Tweten, R.K., and **Ward, G.E.** (2002) *Clostridium septicum* Alpha-Toxin is Active against the Parasitic Protozoan *Toxoplasma gondii* and Targets Members of the SAG Family of GPI-anchored Surface Proteins. Infect.Immun. **70**, 4353-4361. PMID: PMC128134

- Donahue, C.G., Carruthers, V., Gilk, S.D. and **Ward, G.E.** (2000) The *Toxoplasma* Homolog of *Plasmodium* Apical Membrane Antigen-1 (AMA-1) is a Microneme Protein Secreted in Response to Elevated Intracellular Calcium Levels. Mol. Biochem. Parasitol. 111, 15-30.
- Carey, K.L., Donahue, C.G., and **Ward, G.E.** (2000) Identification and Molecular Characterization of *GRA8*, a Proline-rich Dense Granule Protein of *Toxoplasma gondii*. Mol. Biochem. Parasitol. 105, 25-37.
- Carey, K.L. and **Ward, G.E.** (1999) 96-well Plates Providing High Optical Resolution for High- throughput Immunofluorescence-based Screening of Monoclonal Antibodies against *Toxoplasma gondii*. J. Immunol. Meth. 230, 11-18.
- Orfeo, T., Chen, L, Huang, W., **Ward, G.** and Bateman, E. (1999) Distamycin A Selectively Inhibits *Acanthamoeba* RNA Synthesis and Differentiation Biochem. Biophys Acta 1446, 273-285.
- Mattei, D., **Ward, G.E.**, Langsley, G. and Lingelbach, K. (1999) Novel Secretory Pathways in *Plasmodium*? Parasitology Today 15, 235-237.
- Tardieux, I., Baines, I., Mossakowska, M. and **Ward, G.E.** (1998) Actin-binding Proteins of Invasive Malaria Parasites: Regulation of Actin Polymerization by a Complex of 32/34-kDa Proteins Associated with Heat Shock Protein-70kDa. Mol. Biochem. Parasitol. 93, 295-308.
- Ward, G. E.**, Tilney, L. G. and Langsley, G. (1997) Rab GTPases and the Unusual Secretory Pathway of *Plasmodium*. Parasitology Today 13, 57-62.
- de Castro, F. A., **Ward, G.E.**, Jambou, R., Attal, G., Jaureguiberry, G., Chakarabarti, D., Braun- Breton, C., and Langsley, G. (1996) A Family of Rab G-proteins in *Plasmodium falciparum* and a Detailed Characterisation of PfRab6. Mol. Biochem. Parasitol. 80, 77-88.
- Suss-Toby, E., Zimmerberg, J., and **Ward, G.E.** (1996) *Toxoplasma* Invasion: The Parasitophorous Vacuole is Formed from Host Cell Plasma Membrane and Pinches Off via a Fission Pore. PNAS 93, 8413-8418. PMID: PMC38685
- Ward, G. E.** , Fujioka, H., Aikawa, M. and Miller, L. H. (1994) Staurosporine Inhibits Invasion of Erythrocytes by Malarial Merozoites. Exp. Parasitol., 79, 480-487.
- Ward, G. E.**, Miller, L. H., and Dvorak, J. A. (1993) The Origin of Parasitophorous Vacuole Membrane Lipids in Malaria-infected Erythrocytes. J. Cell Science 106, 237-248.
- Adams, J. H., Hudson, D. E., Torii, M., **Ward, G. E.**, Wellems, T. E., Aikawa, M., and Miller, L.H. (1990) The Duffy Receptor Family of *Plasmodium knowlesi* is Located within the Micronemes of Invasive Malaria Merozoites. Cell 63, 141-153.
- Ward, G.E.** and Kirschner, M.W. (1990) Identification of Cell Cycle-Regulated Phosphorylation Sites on Nuclear Lamin C. Cell 61, 561-577.
- Ward, G.E.**, Moy, G.W., and Vacquier, V.D. (1986) Phosphorylation of Membrane-bound Guanylate Cyclase of Sea Urchin Spermatozoa. J. Cell Biol. 103, 95- 101.
- Ward, G. E.**, Brokaw, C.B., Garbers, D.L., and Vacquier, V.D. (1985) Chemotaxis of *Arbacia punctulata* Spermatozoa to Resact, a Peptide from the Egg Jelly Layer. J. Cell Biol. 101, 2324-2329.
- Ward, G.E.**, Garbers, D.L., and Vacquier, V.D. (1984) Effects of Extracellular Egg

- Factors on Sperm Guanylate Cyclase. Science 227, 768-770.
- Suzuki, N., Shimomura, H., Radany, E.W., Ramarao, C.S., **Ward, G.E.**, Bentley, J.K., and Garbers, D.L. (1984) A Peptide Associated with Eggs Causes a Mobility Shift in a Plasma Membrane Protein of Spermatozoa. J. Biol. Chem. 259, 14874-14879.
- Ward, G.E.** and Vacquier, V.D. (1983) Dephosphorylation of a Major Sperm Membrane Protein is Induced by Egg Jelly During Sea Urchin Fertilization PNAS 80, 5578-5582. PMID: PMC384301
- Ward, G.E.**, Vacquier, V.D. and Michel, S. (1983) The Increased Phosphorylation of Ribosomal Protein S6 in *Arbacia punctulata* is not a Universal Event in the Activation of Sea Urchin Eggs. Develop. Biol. 95, 360-371.

REVIEWS

- Bogyo, M and **Ward, G.E.** (2013). *Toxoplasma gondii* Chemical Biology. In *Toxoplasma gondii: The Model Apicomplexan - Perspective and Methods* (Weiss, L and Kim, K. - eds), 703-726.
- Mital, J. and **Ward, G.E.** (2007) Current and Emerging Approaches to Studying Invasion in Apicomplexan Parasites. In: *Molecular Mechanisms of Parasite Invasion* (Dominique Soldati and Barbara Burleigh-eds). Landes Bioscience.
- Ward, G. E.** , Chitnis, C. E., and Miller, L. H. (1994) Invasion of Erythrocytes by Malarial Merozoites. In *Strategies for Intracellular Survival of Microbes* (D. Russell - ed.), W.B. Saunders Co., London, pp. 155-190.
- Ward, G.E.**, Moy, G.W., and Vacquier, V.D. (1986) Dephosphorylation of Sperm Guanylate Cyclase During Sea Urchin Fertilization. In *Molecular and Cellular Biology of Fertilization* (Hedrick, J., ed.), Plenum Press, New York, p. 359-383.

PATENTS

“Identification of Anti-Protozoal Agents”

N.J. Westwood, **G.E. Ward**, K.L. Carey and T.J. Mitchison
Patent No. US 7,067,315 B2, issued 6/27/06

“Toxoplasma gondii Apical Membrane Antigen-1”

G.E. Ward and C.G. Donahue
Non-provisional application (S/N 10/039,770) filed with the USPTO 11/9/01

“Methods and Compositions for expressing functional Class XIV Myosin”

K.M Trybus and **G.E. Ward**
Patent No. US 9,409,962, issued 8/9/16