

1. Personal data

Origin U.S. Citizen, born in San Francisco.
Work Department of Biochemistry, UW Box 357350, HSB J-Wing, Rm. 357
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2. Education

2000 Ph.D., Microbiology and Immunology, Oregon Health & Science University.
Graduate research with Magdalene So, Ph.D.
1992 B.A., Biology, Reed College, Oregon.

3. Postdoctoral training and other professional experience

2000–'04 Postdoctoral research fellow with William Wickner, M.D.
Department of Biochemistry, Dartmouth Medical School, Hanover NH.
1999 Visiting scholar with Michael Sheetz, Ph.D. Dep't. of Cell Biology, Duke University.
1992–'94 Senior Technician, Oregon Health & Science University.
→1992 Testing of custom statistical software (Red Brick Systems, now a unit of IBM;
supervisor: Ralph Kimball, Ph.D.) · Bike Messenger · Freelance Photographer ·
Explainer (San Francisco Exploratorium).

4. Faculty positions held

2012→ Adjunct Associate Professor of Physiology & Biophysics, University of Washington.
2010→ Associate Professor of Biochemistry (with tenure), University of Washington.
2011→ Faculty, UW Biological Physics, Structure & Design (BPSD) Graduate Program.
2004→ Faculty, UW Center for Nanotechnology.
2004→ Faculty, UW Molecular and Cellular Biology (MCB) Graduate Program.
2004–'10 Assistant Professor of Biochemistry, University of Washington.

5. Hospital positions (*not applicable*)

6. Honors & awards

- 2010–'13 American Cancer Society Research Scholar (RSG-10-026-01-CSM).
2003–'04 NIH Postdoctoral Fellowship (T32 AR07576).
2000–'03 Damon Runyon Cancer Research Foundation Postdoctoral Fellowship (DRG-1598).
2001 Paper of the Year (*Nature* 407:98), OHSU Graduate Council.
1997 Sears Award for Excellence in Graduate Medical Education.
1996–'97 N.L. Tartar Research Award, OHS Foundation.
1996–'99 NIH Predoctoral Fellowship (T32 AI0747).
1992 HHMI Undergraduate Research Fellowship.

7. Board certifications (*not applicable*)

8. Licenses to practice (*not applicable*)

9. Professional organizations

American Association for the Advancement of Science · American Society of Cell Biologists · American Society for Biochemistry and Molecular Biology · National Center for Science Education.

10a. Teaching

- 2012→ UW BIOC441. Biochemistry (c. 290 undergraduate Biochemistry majors). Fifteen lectures plus exams, honors sections, and administration (*pending*).
2010–'12 UW BIOC406. Introduction to Biochemistry (c. 640 undergraduates in two sections – about one in ten UW undergraduates take this course). Course Director. Fifteen to twenty lectures, four exams, online tutoring, and almost all course administrative overhead (>50% of the course).
2009→ UW BIOC542. Biochemistry Literature review. Two lectures.
2008–'09 UW BIOC406. Introduction to Biochemistry (c. 550 undergraduates). With J. Hurley. Fifteen lectures plus weekly 90-minute problem review sessions (50% of the course).
2006→ UW BMSD540. Biomolecular Structure and Design Literature Review. With W. Parson *et al.* One lecture.
2006–'07 UW BIOC406. Introduction to Biochemistry (c. 500 undergraduates). With J. Hurley and P. Petra. Ten lectures plus weekly 90-minute problem review sessions (33% of the course).
2005–'07 UW CONJ541. Molecular Biology of Cellular Processes. Three lectures and exam. With P. Bornstein *et al.*
1998–'00 OHSU MB611. Principles of Microbial Pathogenesis. Lecturer; six classroom hours.
1998 OHSU MB610. Microbiology for Medical Students. Laboratory TA.

I0b. Current postdoctoral trainees

9/2013→ Elizabeth Manrao, B.S.S.E., Ph.D. (University of Washington).

10/2010→ Hannah Chapin, Ph.D. (Yale University School of Medicine).

UW Basic Biology of Aging Postdoctoral Fellow.

11/2008→ Daniel P. Nickerson, Ph.D. (University of Colorado, Boulder).

American Cancer Society Postdoctoral Fellow.

I0c. Previous postdoctoral trainees

'2011-'13 Margaret Lo, Ph.D. (UW).

2005-'10 Christopher L. Brett, Ph.D.

Assistant Professor of Biology & Canada Research Chair II, Concordia University, Montreal.

I0e. Previous graduate trainees

2007→'13 Andrew Paulsel, B.S., Biochemistry Ph.D. (Biochemistry).

2007→'12 Braden Lobingier, B.S., Biochemistry Ph.D. (Biochemistry).

2008-2011 CMB Training Grant Predoctoral Fellowship.

Postdoc with Mark von Zastrow, UCSF.

2006-'11 Sheng-Ying (Margaret) Lo, Ph.D. (Physical Chemistry). Co-mentor: Sarah Keller.

2007-8 UW IGERT Nanotechnology Fellowship. 2008 ASCB Travel Award. 2009-10 UW IGERT Nanotechnology Fellowship.

2005-'10 Matthew Schwartz, Ph.D. (Biochemistry).

UW CMB Training Grant Predoctoral Fellowship. Schulz Travel Fellowship.

Postdoc with Eric Jorgensen, HHMI University of Utah.

2005-'10 Cortney G. Angers, Ph.D. (Biochemistry). *Technical writer, Delta Pharma.*

2009-'10 Erina Kitano, Ph.D., Kobe University Medical School (UW-Kobe Exchange Program).

I0f. Rotation graduate students

2013 Brantley Coleman

2013 George Ueda

2011 Amy Lassen

2010 Emily Fawcett

2010 Matthew Iadanza

2008 Breanna Vollmar

2005 Robert Vernon

10e. Undergraduate trainees

- 2012-14 Michelle Tran
- 2009 Emily Fawcett, B.S. (St. Mary's College; Amgen Summer Scholar).
- 2008 Ankita Mishra, B.S. (Caltech; Amgen Summer Scholar).
- 2007-'08 Julee Ashmead, B.S.
- 2007-'10 Carter Yeh, B.S.
- 2007-'08 Howard Chang, B.S.
- 2007-'08 Ellen Lesh, B.S.
- 2006-'07 Mary Nader Morcos, B.S. (Biology). From Fall 2007: Medical school, UWSOM.
- 2005-'06 Jacob Tedrow, B.S., (Biochemistry).
- 2005-'06 Debra Sprague, B.S. (Biology), Ph.D. (English), HHMI Undergraduate Fellow.
Currently employed as a biomedical writer in Seattle.
- 2005-'06 Michel Tran, Biochemistry undergraduate.

10g. Laboratory professional staff

- 2005→ Rachael Plemel, B.S., Research Scientist.

10h. Thesis committees (partial list)

- Emily Fawcett (advisor: Dana Miller).
- Ashley George (advisor: Susan Brockerhoff).
- 2014 Matt Iadanza, Ph.D. (advisor: Tamir Gonen).
- 2014 Neil Umbreit, Ph.D. (advisor: Trisha Davis).
- 2014 Breanna Vollmar, Ph.D. (advisor: Tamir Gonen).
- 2014 Connie Lu, Ph.D. (advisor: Wim Hol).
- 2011 Colin Corrent, Ph.D. (advisor: Roland Strong).
- 2011 Joel Rosenbaum, Ph.D. (Advisor: Rich Gardner)
- 2011 Tom Schmidlin, Ph.D. (advisors: Brian Kennedy and Valerie Daggett).
- 2011 Andrei Chertov, Ph.D. (advisor: James Hurley).
- 2011 Jeremy Logue, Ph.D. (advisor: John Scott).
- 2010 Lars Holzhausen, Ph.D. (advisor: Dr. Susan Brockerhoff).
- 2010 Megan Wargacki, Ph.D. (Advisor: Trisha Davis).
- 2010 Aurelia Honerkamp-Smith, Ph.D. (Advisor: Sarah Keller).
- 2010 Michelle Shimogawa, Ph.D. (advisor: Trisha Davis).
- 2007 Stacy Marie Alvares, Ph.D. (advisor: Dr. William Carter).

- 2006 Kevin Schutz (advisor: Dr. Stanley Fields).
- 2006 Brian Schultz, Ph.D. (advisor: Dr. Jeff Chamberlain).
- 2006 Meghan Fleugel, Ph.D. (advisor: Dr. Leo Pallanck).
- 2006 Ross Centers (advisor: Dr. Stanley Fields).
- 2005 Simone Bennett, M.S. (advisor: Dr. Paul Muchowski).

11. Editorial responsibilities

• **Referee:** *Science* · *Nature* · *BBA* · *Biophys. J.* · *Curr. Biol.* · *Dev. Cell* · *Euk. Cell* · *F1000 Biol. Genetics* · *J. Bact.* · *JBC* · *JCB* · *JCS* · *J. Neurosci.* · *MBC* · *Mol Microbiol.* · *Nanotechnology* · *NCB* · *NSMB* · *Nat. Protocols* · *PLoS ONE* · *PLoS Pathogens* · *PNAS (Referee; ad hoc Editor)* · *Traffic*.

12. Special national & international responsibilities

- 2011–'14 ASBMB Membership Committee.
- 2013 Co-chair, Symposium on Protein and Organelle Quality Control. *2013 American Society for Cell Biology Annual Meeting*.
- 2011 Co-chair (with M. Kaksonen), Mini-Symposium on Membrane Fission and Fusion. *2011 American Society for Cell Biology Annual Meeting*.
- 2011 Tenure review panel (*ad hoc*), University of Louisville.
- 2011 NIH grant review, *ad hoc*.
- 2007 ASBMB Membership Committee, *ad hoc*.

13. Special local responsibilities

- 2014–'16 UW Faculty Senate.
- 2013→ UW Biochemistry Faculty Mentoring Committee for Dr. S. Hoppins.
- 2012→ Admissions Committee, UW Biophysics, Structure & Design Graduate Program.
- 2012→ UW Biochemistry Seminar Committee.
- 2012→ UW Biochemistry Departmental Retreat Organizing Committee
- 2011→ UW Biochemistry Faculty Mentoring Committee for Dr. M. Ailion.
- 2011→ Hans Neurath Lecture Organizing Committee.
- 2010→ Working Committee, Raymond and Beverly Sackler Scholars in Integrative Biophysics.
- 2014 UW Institute for Protein Design Faculty Search Committee.
- 2012–'14 UW Faculty Senate.
- 2012–'13 UW Medicine Search Committee for UW Biochemistry Department Chair.
- 2011–'12 UW Biochemistry Graduate Admissions Committee (Chair).
- 2010–'11 UW Biochemistry Faculty Search Committee.
- 2010–12 UW Biochemistry Dep't. Website Committee (Chair)
- 2009–'10 UW Biochemistry Faculty Search Committee.

- 2008–'09 UW Biochemistry Faculty Search Committee.
2009–'11 UW Biochemistry Undergraduate Teaching Committee (Chair).
2008–'09 UW Biochemistry Faculty Search Committee.
2007–'09 UW Biochemistry Seminar Committee.
2007–'08 UW Biochemistry Faculty Search Committee.
2005–'09 UW Cellular and Molecular Biology Training Grant (T32 GM007270)
Fellowship Selection Committee.
2005–'07 UW Biochemistry Graduate Admissions Committee.
2006–'08 UW Royalty Research Fund, *ad hoc* referee.
2006 UW Mary Gates Undergraduate Research Scholarships, *ad hoc* referee.

I4a. Current research support

- 2006–'16 *Dynamics of endomembrane docking and fusion*. NIH R01 GM077349. PI: Merz
The goal of this study is to elucidate fundamental mechanisms of biological membrane fusion by developing and exploiting new tools to trap and study pre-fusion intermediate complexes on docked biological membranes.

I4b. Pending research support

- 2014 *Membrane fusion pore conductance and dynamics in organelle and synthetic liposome systems*.
NSF 1411276. PI: Merz, with S.E. Gordon, E.R. Chapman, M.B. Jackson
We propose to study membrane fusion at μ s time scales by making the first-ever capacitance recordings of SNARE-mediated fusion pore dynamics in purified organelles and synthetic giant unilamellar vesicles.

I4c. Completed research support

- 2010-'13 *Molecular basis of endolysosomal traffic control*. American Cancer Society Research Scholar grant. RSG-10-026-01-CSM. PI: Merz.
The goal of this study is to explore the comparative biochemistry of Vps-C protein complexes (HOPS and CORVET) and their functions in endocytic traffic.
- 2009 *NIH Small Instrumentation Grant: Analytical Ultracentrifuge*. PI: Klevit.
2009 *Protein phosphorylation in vacuole fusion*. NIH P41RR011824-14, sub. 8009. PI: Davis.
2009 *Protein interactions with vacuole targeting machinery*. NIH P41RR011824-14, sub. 8061. PI: Davis.

I5a. Papers in refereed journals (• eggs; not to be counted before hatching)

35. Lobingier BT, Nickerson DP, Lo M and Merz AJ. 2014. SM proteins Sly1 and Vps33 co-assemble with Sec17 and SNARE complexes to oppose SNARE disassembly by Sec18. *eLife* doi: 10.7554/eLife.02272

34. Brodsky J., **Merz A** and Serio T. 2014. Meeting report: Organelle and protein quality control mechanisms: how cells keep calm and carry on. *Molecular Biology of the Cell* 25:733-734. doi: 10.1091/mbc.E13-11-0672
33. Paulsel AL, **Merz AJ**, Nickerson DP. 2013. Vps9 family protein Muk1 is a second Rab5 GEF in budding yeast. In press, *Journal of Biological Chemistry* 288:18162-71.
32. Lockshon D, Perez C, Brett CL, Chertov A, **Merz AJ**, Van Gilst M, Kennedy B. 2012. Rho signaling participates in membrane fluidity homeostasis. *PLoS ONE* 7:e45049.
31. Lobingier BT and **Merz AJ**. 2012. Sec1/Munc18 protein Vps33 binds to SNARE domains and the quaternary SNARE complex. *Molecular Biology of the Cell*, 23:4611.
30. Nickerson DP, Russell MRG, Lo SY Milnes J and **Merz AJ**. 2012. Termination of isoform-specific Vps21/Rab5 signaling at endolysosomal organelles by Msb3/Gyp3. *Traffic* 13:1411-28.
29. *Schwartz ML, *Chapin HC and **Merz AJ**. 2012. Isolation of yeast vacuoles and *in vitro* assays of homotypic fusion. *Journal of Visualized Experiments*, in press. *Equal contributors.
28. Lo S-Y, Brett CL, Plemel R, Vignali M, Fields S, Gonen T and **Merz AJ**. 2012. Intrinsic tethering activity of endosomal Rab proteins. *Nature Structural and Molecular Biology*, 19:40-47. *Faculty of 1000 Recommended.
27. *Plemel RL, *Lobingier BT, Brett CL, Nickerson, DP, Angers CG, Paulsel A, Sprague D and **Merz AJ**. 2011. Subunit organization and Rab interactions of Vps-C complexes that control endolysosomal membrane traffic. *Molecular Biology of the Cell* 22:1353-63. *Equal contributors.
26. Angers C and **Merz AJ**. 2011. Review: New links between vesicle coats and Rab-mediated vesicle targeting. *Seminars in Cell and Developmental Biology* 22:18-26.25.
25. Hood RD, Singh P, Hsu F, Güvener T, Carl MA, Trinidad RRS, Silverman JM, Ohlson BB, Hicks KG, Plemel RL, Li M, Schwartz S, Wang WY, **Merz AJ**, Goodlett D, Mougous J. 2010. Discovery of Type VI secretion substrates in *Pseudomonas aeruginosa*: identification of a toxin targeted to bacteria. *Cell Host & Microbe* 7:25-37. *Cover article; Faculty of 1000 Must Read.
24. Zheng H, Taraska J, **Merz AJ** and Gonen T. 2010. The prototypical H⁺/galactose symporter GalP assembles into functional trimers. *Journal of Molecular Biology*, 19:40-47. *Cover article.
23. Angers C and **Merz AJ**. 2009. HOPS interacts with Apl5 at the vacuole membrane and is required for consumption of AP-3 transport vesicles. *Molecular Biology of the Cell* 20:4563-4574.
22. Nickerson DP, Brett CL and **Merz AJ**. 2009. Review: Vps-C complexes: master regulators of endolysosomal membrane traffic. *Current Opinion in Cell Biology* 21:543-559.
21. Colette JR, Chi RJ, Boettner DR, Fernandez-Golbano IM, Plemel RL, **Merz AJ**, Geli MI, Traub LM, Lemmon SK. 2009. Clathrin functions in the absence of the terminal domain binding site for adaptor-associated clathrin-box motifs. *Molecular Biology of the Cell* 20:3401-3413.
20. Schwartz ML and **Merz AJ**. 2009. Capture and release of partially-zipped *trans*-SNARE complexes on intact organelles. *Journal of Cell Biology* 185:535-549.

19. Brett CL, Plemel RL, Lobingier BT, Vignali M, Fields S and **Merz AJ**. 2008. Efficient termination of vacuolar Rab GTPase signaling requires coordinated action by a GAP and a protein kinase. *Journal of Cell Biology* 182:1141-51. *JCB featured paper; Faculty of 1000 Recommended.
18. Brett CL and **Merz AJ**. 2008. Osmotic regulation of Rab-mediated organelle docking. *Current Biology* 18:1072-7.
17. Lee SW, Higashi DL, Snyder, A, **Merz AJ**, Potter L and So M. 2005. PilT is required for PI(3,4,5)P-mediated crosstalk between *Neisseria gonorrhoeae* and epithelial cells. *Cellular Microbiology* 7:1271-1284.
16. Thorngren N, Collins KM, Fratti R, Wickner WT and **Merz AJ**. 2004. A soluble SNARE drives rapid docking, bypassing the need for ATP and Sec17/18p for vacuole fusion. *EMBO Journal* 23:2765-2776.
15. **Merz AJ** and Wickner WT. 2004. Resolution of organelle docking and fusion kinetics in a cell-free assay. *Proceedings of the National Academy of Sciences* 101:11549-11553.
14. Fratti RA, Jun Y, **Merz AJ**, Margolis N and Wickner WT. 2004. Interdependent assembly of specific regulatory lipids and membrane proteins into the vertex ring domain of docked vacuoles. *Journal of Cell Biology* 167:1087-1098.
13. **Merz AJ** and Wickner WT. 2004. *Trans*-SNARE interactions elicit Ca²⁺ efflux from the yeast vacuole lumen. *Journal of Cell Biology* 164:195-206.
12. **Merz AJ** and Higgs HN. 2003. *Dispatch (minireview): Listeria motility: biophysics pushes things forward.* *Current Biology* 13:R302-304.
11. Wang L, **Merz AJ**, Collins KM and Wickner WT. 2003. Hierarchy of protein assembly at the vertex ring domain for yeast vacuole docking and fusion. *Journal of Cell Biology* 160:365-374.
10. Boeddinghaus C, **Merz AJ**, Laage R and Ungermann C. 2002. A cycle of Vam7p release from and PtdIns-3-P-dependent rebinding to the yeast vacuole is required for homotypic vacuole fusion. *Journal of Cell Biology* 157:79-89. *Faculty of 1000 Recommended Paper.
9. **Merz AJ** and Forest KT. 2002. *Review: Bacterial surface motility: slime trails, grappling hooks, and nozzles.* *Current Biology* 12:R297-303.
8. Wang L, Seeley, S, Wickner WT and **Merz AJ**. 2002. Vacuole fusion at a ring of vertex docking sites leaves membrane fragments within the organelle. *Cell* 108:357-69.
7. **Merz AJ**, So M and Sheetz MP. 2000. Pilus retraction powers bacterial twitching motility. *Nature* 407:98-102.
6. **Merz AJ** and So M. 2000. *Review: Interactions of pathogenic Neisseriae with epithelial cell membranes.* *Ann. Rev. Cell and Developmental Biology* 16:423-457.
5. Hopper S, Vasquez B, **Merz A**, Clary S, Wilbur JS and So M. 2000. Effects of the immunoglobulin A1 protease on *Neisseria gonorrhoeae* trafficking across polarized T₈₄ epithelial monolayers. *Infection and Immunity* 68:906-911.
4. **Merz AJ**, Enns CA and So M. 1999. Type IV pili of pathogenic *Neisseriae* elicit cortical plaque formation in epithelial cells. *Molecular Microbiology* 32:1316-1332. *Cover article.

3. **Merz AJ** and So M. 1997. Attachment of piliated, Opa- and Opc- gonococci and meningococci to epithelial cells elicits cortical actin rearrangements and clustering of tyrosine-phosphorylated proteins. *Infection and Immunity* 65:4341-4349.
2. **Merz AJ**, Rifken DB, Arvidson CG and So M. 1996. Traversal of a polarized epithelium by pathogenic Neisseriae: facilitation by type IV pili and maintenance of epithelial barrier function. *Molecular Medicine* 2:745-754.
1. Waldbeser LS, Ajioka RS, **Merz AJ**, Puaoi D, Lin L, Thomas M and So M. 1994. The *opaH* locus of *Neisseria gonorrhoeae* MS11A is involved in epithelial cell invasion. *Molecular Microbiology* 13:919-928.

15b. Manuscripts in prep.

- Schwartz ML and **Merz AJ**. Partially-zipped SNARE complexes are detected and inactivated by an in vivo quality control system.
- **Merz AJ** and Odorizzi G. The endolysosomal system of *Saccharomyces cerevisiae*. Commissioned comprehensive review for *The Yeast Book: Molecular and Cellular Biology of Saccharomyces*, a comprehensive series to be published in *Genetics*.
- Chapin HC, Miller DL and **Merz AJ**. Determinants of tissue-specific mTORC1 signaling in growth and development.
- Chapin HC, Miller DL and **Merz AJ**. Development of new probes reveals quantitative changes in autophagy over the *C. elegans* life span.
- Nickerson DP and **Merz AJ**. LUCID: a quantitative method to assay cargo packaging into multivesicular endosomes *in vivo*.
- Lo S-Y and **Merz AJ**. Mutagenesis and high-throughput selection of peripheral membrane proteins with defined chemical affinities.

16b. Selected talks

- 2014 Invited Lecture, University of Washington-Kobe University Joint Symposium on Membrane Biology.
- 2013 Co-Chair, Symposium on Protein and Organelle Quality Control. *2013 American Society for Cell Biology Annual Meeting*.
- 2013 Invited Lecture, UC Santa Cruz, MCD Biology.
- 2013 Invited Lecture, UT Southwestern Department of Biochemistry.
- 2012 Titration of Rab5 signaling at late endosomal organelles. *Gordon Research Conference: Lysosomes & Endocytosis*.
- 2012 Seminar, UCLA Molecular Biology Institute.
- 2012 Seminar, Dep't. of Microbiology, University of Washington.
- 2012 Seminar, Dep't. of Physiology & Biophysics, University of Washington.
- 2011 Mini-Symposium on Membrane Fission and Fusion. *2011 American Society for Cell Biology Annual Meeting*.

- 2011 Invited Lecture, School of Medicine, Korean National University, Daegu.
- 2010 Seminar, Dep't. of Molecular, Cell, and Developmental Biology, University of Colorado, Boulder.
- 2010 Invited Lecture, 4th Global COE Workshop on Integrated Membrane Biology: Endosomal Traffic and Beyond. University of Kobe, Japan.
- 2009 Seminar, Dep't. of Physiology, Johns Hopkins University School of Medicine.
- 2008 Vps-C tethering complexes in late endocytic traffic. *ASCB Annual Meeting*.
- 2008 A Rab-dependent, effector-independent vesicle tethering reaction. *ASCB Annual Meeting: Monomeric GTPases Special Interest Subgroup*.
- 2008 Seminar, Seattle Biomedical Research Institute.
- 2008 A truncated SNARE traps pre-fusion *trans*-complexes. *Gordon Research Conference: Molecular Cell Biology*.
- 2007 Membrane tension promotes fusion by activating Rab-mediated tethering and docking. *60th Annual Symposium, Society of General Physiologists: Membrane Biophysics of Fusion, Fission, and Rafts in Health and Disease. J. Gen Physiol.* 130:13a. Presented by C. Brett, a postdoc in my group.
- 2007 Chair (with M. Kaksonen), Workshop on Protein Transport and Turnover, *XXIII International Conference on Yeast Genetics and Molecular Biology*, Melbourne, Australia.
- 2007 Seminar, Department of Physiology and Biophysics, University of Washington.
- 2006 Seminar, Department of Cell Biology and Anatomy and Liver Research Center, Albert Einstein School of Medicine.
- 2005 Seminar, Cellular and Molecular Biology, Oregon Health & Science University.
- 2005 Seminar, Department of Biology, Reed College.
- 2004 Steps to fusion: assembly of a complex docking junction between yeast vacuoles. *Gordon Research Conference: Lysosomes and Endocytosis*.
- 2004 Seminar, Department of Biochemistry and Biophysics, UC San Francisco.
- 2004 Seminar, Department of Biochemistry, University of Washington.
- 2004 Seminar, MCDB Department, UC Santa Barbara.
- 2004 Seminar, Department of Biochemistry, Duke University.
- 2004 Seminar, Department of Biological Sciences, Columbia University.
- 2003 Seminar, Department of Molecular Microbiology and Immunology, Oregon Health & Science University.
- 2000 Pilus retraction powers twitching motility and pattern formation by *Neisseria gonorrhoeae*. *Gordon Research Conference: Bacterial Cell Surfaces*.
- 1999 Adhesion of pathogenic *Neisseriae*: type IV pili trigger cortical rearrangements in epithelial cells. *ASM Conference: A Cell Biology Approach to Microbial Pathogenesis*.
- 1996 ASM Foundation Lecture: How the pathogenic *Neisseriae* modify host cell functions during mucosal colonization. type IV pili trigger cortical rearrangements in epithelial cells. *Ohio and Indiana Regional ASM Meeting*.

16d. Research collaborations

D. Miller *et al.*, UW. Developmental control of TORC1 signaling.

D. Baker *et al.*, UW/HHMI. SNARE selectivity in fusion; redesign of PH domains.

S. Gordon *et al.*, UW. Patch capacitance analysis of yeast vacuole fusion.

G. Odorizzi *et al.*, University of Colorado. Endosomal maturation; AP-3 mediated protein traffic.

17. Extramural Activities

Road and adventure bicycling; documentary photography.