Curriculum Vitae

PERSONAL DATA

Name: Adam Frost
Birth Place: Utah
Citizenship: United States

EDUCATION

Years	Degree	Institution (Area of Study)
2009 – 06/2011	Postdoctoral Fellow	University of California, San Francisco (Cellular and Molecular Pharmacology) San Francisco, CA
2000 – 05/2009	M.D.	Yale University School of Medicine (Medical Scientist Training Program) New Haven, CT
2003 – 05/2008	Ph.D.	Yale University (Interdepartmental Neuroscience Program) New Haven, CT
1996 – 04/2000	B.S.	Brigham Young University (Honors Biochemistry) Provo, UT

ACADEMIC HISTORY

University of California, San Francisco **Department of Biochemistry and Biophysics**
09/01/2014 Hire, Tenure Track, Assistant Professor

University of Utah **Department of Biochemistry**
07/01/2011 Hire, Tenure Track, Assistant Professor

PROFESSIONAL EXPERIENCE

Full Time Positions

2014 - Present	Assistant Professor, Department of Biochemistry and Biophysics University of California, San Francisco, CA
2014 - Present	Adjunct Assistant Professor, Department of Biochemistry University of Utah School of Medicine, Salt Lake City, UT
2011 - 2014	Assistant Professor, Department of Biochemistry and Huntsman Cancer Institute, University of Utah School of Medicine, Salt Lake City, UT
2009 - 2011	Post-Doctoral Scholar, University of California, San Francisco, CA Mentor: Jonathan Weissman, PhD
2000 - 2009	Medical Scientist Training MD/PhD Program, Yale University School of Medicine, CT Mentor: Vinzenz Unger, PhD. Co-mentor: Pietro De Camilli, MD
1997 - 2000	Undergraduate Research Intern, Brigham Young University, UT Mentor: David Busath, MD

HONORS AND AWARDS

2016	American Asthma Foundation Scholar
2015	Herbert Boyer Junior Faculty Endowed Chair
2013	NIH Director's New Innovator
2013	Searle Scholar
2009	Howard Hughes Medical Institute Fellow of the Life Sciences Research Foundation
2009	Yale University School of Medicine Dissertation Award & Farr Scholarship Lecture
2008	Sara and Frank McKnight Fellowship, UT Southwestern Medical Center (Declined)
2006	Epilepsy Foundation Pre-Doctoral Research Training Fellowship
2006	Invited Student Delegate to the 45th Annual International Academy of Achievement
2004	The Milton C. Winternitz Prize in Pathology, Yale School of Medicine
2000	NIH/NIGMS, Medical Scientist Training Program Grant GM-07205
2000	*Cum laude* in Honors Chemistry and Biochemistry, Brigham Young University
1999	Harry S. Truman Scholarship, Finalist
1999	Barry M. Goldwater Scholarship for Math, Science and Engineering
1995	Most Outstanding Inorganic Chemistry Undergraduate Student Award
1994	Mangum-Lewis Undergraduate Scholarship (full support)

Reviewer Experience

Reviewer for eLife, Science, Nature Press Group: Nature, Nature Cell Biology, Nature Communications, Nature Structural and Molecular Biology, European Molecular Biology Organization (EMBO), Cell Press: Developmental Cell, Cell Reports, Biophysical Journal, Current Biology, Journal of Cell Biology, Journal of Molecular Biology, Proceedings of the National Academy of Sciences (PNAS), Current Opinion in Structural Biology, Reviewer for Biochemistry, ACS, Nucleic Acids Research, Editorial Board of Frontiers in Membrane Traffic

UNIVERSITY COMMUNITY ACTIVITIES

University of California, San Francisco

2014 - Present	Faculty Member, Summer Research Training Program (SRTP) Selection and Placement Committee, chaired by Carol Gross.
2014 - Present	Faculty Member, Junior Faculty Search Committee, chaired by Wallace Marshall

University of Utah Health Sciences Level

2012 - Present	Faculty Member, Core Research Facilities, Cell Imaging/Fluorescence Microscopy Facility, Oversight Committee
2012 - Present	Faculty Member, Research Microscopy Facility, Center for Advanced Microscopy, Oversight Committee
2012 - Present	Faculty Chair, Core Research Facilities, Electron Microscopy Core Facility, Oversight Committee

University of Utah Programs, Centers & Institutes

2011 - 2013	Member, Biological Chemistry Graduate Program, Admissions committee
2013 - 2014	Chair, Biological Chemistry Graduate Program, Admissions committee

FUNDING

Active Grants

9/30/13 - 6/30/18 Toward Atomic Resolution of Membranes and Membrane-Associated Machines
1DP2GM110772-01
Principal Investigator: Adam Frost
Direct Costs: $1,500,000 Total Costs: $2,345,000
NIH/NIGMS New Innovators High Risk High Reward Director's Program
Role: Principal Investigator

7/01/13 - 6/30/16 Structural and Functional Characterization of the Ribosome Quality Control Complex
13SSP218
Principal Investigator: Adam Frost
Direct Costs: $300,000, Total Costs: $300,000
Searle Scholars Program
Role: Principal Investigator

9/01/14 - 8/31/16 Structure of srGAP Proteins
BSF Grant #2013310
Principal Investigators: Adam Frost, Yarden Opatowsky
Direct Costs: $120,000, Total Costs: $120,000
Binational United States – Israel Science Foundation
Role: Principal Investigator

9/01/14 - 8/31/17 Structure and Function of the Exocyst Complex
2R01GM068803-10
Principal Investigator: Mary Munson (UMASS)
Direct Costs: $219,992 (Frost Lab), Total Costs: $347,587 (Frost Lab, UCSF)
NIH/NIGMS
Role: Sub-contract/Co-PI

7/01/15 – 6/30/16 New Concepts for Understanding and Treated Neurodegenerative Disease
New Frontiers Research Program,
Direct Costs: $150,000 (Frost Lab)
Sandler Foundation and UCSF Program for Breakthrough Biomedical Research
Role: Principal Investigator

6/01/16 – 5/30/18 Structural Basis of Heritable Human Asthma and Other Sphingolipid Diseases
2016 AAF Scholar Award (16-0052; Frost)
Direct Costs: $300,000 (Frost Lab)
American Asthma Foundation
Role: Principal Investigator

Past Grants

2/01/13 - 6/30/14 Structural Biology Center for HIV/Host Interactions in Trafficking and Assembly
2P50GM082545-06
Principal Investigator: Wesley I. Sundquist
Direct Costs: $162,000 Total Costs: $162,000 (Frost Laboratory)
National Institute of General Medical Sciences
Role: Collaborative Development Grant Investigator

1/01/12 - 12/31/12 Cell cycle control by a novel membrane protein complex of the Golgi
Principal Investigator: Adam Frost
Direct Costs: $28,000 Total Costs: $28,000

University Of Utah Research Foundation Seed Grant
Role: Principal Investigator

7/01/11 - 6/30/12 Cell Response and Regulation Cancer Center Support Grant
Principal Investigator: Adam Frost
Direct Costs: $21,000 Total Costs: $21,000
Huntsman Cancer Institute
Role: Principal Investigator

3/01/11 - 6/30/11 Acquisition of a Field Flow Fractionation Chromatography System
Principal Investigator: Adam Frost
Direct Costs: $89,608 Total Costs: $89,608
University of Utah Vice President for Research
Role: Principal Investigator

12/01/10 - 6/30/11 Fellowship - Adam Frost
Principal Investigator: Adam Frost
Direct Costs: $56,000 Total Costs: $56,000
Life Sciences Research Foundation
Role: Principal Investigator

TEACHING RESPONSIBILITIES/ASSIGNMENTS

Course Lectures

2015 – present Lecturer, iPQB Program, Structural Biology
2014 – present Lecturer, Tetrad Program, Cell Biology
2012 – 2014 Instructor, BLCHM C 6400: Genetic Engineering, University of Utah, 2 credit hours, 12 lecture hours, 20 students, Team taught with Dana Carroll
2012 - 2014 Lecturer, M BIOL 6480: Cell Biology I, 1.5 credit hours, 37 students, University of Utah. 5 lectures
2011 - 2014 Instructor, BIO C 7020: Biochem Research in Progress, University of Utah, Biochemistry
2011 - 2014 Instructor, MBIOL 6100: Seminar Journal Club, University of Utah

Small Group Teaching

2015 – present Medical School, M3 Molecular Biology
2011 - 2014 Medical School, Third Year Internal Medicine Clerkship Facilitator and Lecturer

Trainee Supervision

Post-Doctoral Scholars

2011 - 2013 Supervisor, Marc Elgort, University of Utah.
Ph.D. University of Utah, 2010
Project: Cell cycle regulation by a tumor suppressive complex of the golgi
Trainee's Current Career Activities: Instructor, InnovaBio, Salt Lake City, UT

2012 - 2015 Supervisor, Peter Shen, University of Utah.
Ph.D. Brigham Young University, 2011
Project: Structure and function of the ribosome quality control complex
Trainee's Current Career Activities: Research Assistant Professor, Department of Biochemistry, University of Utah School of Medicine, Salt Lake City, UT

2011 - Present Supervisor, Mingyu Gu, University of Utah.
Ph.D. University of Utah, 2010
Project: The role of the ESCRT pathway in nuclear membrane remodeling

2015 - Present Co-Supervisor, Nicole Schirle, University of California, San Francisco
Ph.D. Scripps Research Institute, 2014
Project: The structure and function of the EMC

2016 - Present Supervisor, Henry Nguyen, University of California, San Francisco
Ph.D. Yale University, 2015
Project: The role of the ESCRT pathway in nuclear membrane remodeling

2016 - Present Supervisor, Alexander Von Appen, University of California, San Francisco
Ph.D. European Molecular Biology Laboratory (EMBL), 2015
Project: The role of the ESCRT pathway in nuclear membrane remodeling

Masters

2011 - 2012 Supervisor, Seth Lilavivat, University of Utah.
B.S. Georgia Institute of Technology, 2008
Project: A novel lysosome homeostasis pathway with tumor suppressive properties
Trainee's Current Career Activities: Staff scientist, BioFire, Salt Lake City, UT

PhD/Doctorate

2011 - Present Supervisor, Raghav Kalia, University of Utah.
B.S. Hans Raj College, Delhi University, 2007
M.S. Jawaharlal Nehru University, 2010
Project: The Structural Basis of mitochondrial membrane remodeling

2013 - Present Supervisor, Nathaniel Talledge, University of Utah.
B.S. University of Minnesota, Twin Cities, 2011
Project: Structural inhibition of Dynamin-mediated membrane fission by BAR-domain containing proteins

2015 - Present Supervisor, Lillian Kenner, UCSF
B.S. University of California, Santa Cruz, 2007
Project: TBD

2015 - Present Supervisor, Beatriz Osuna, UCSF
B.S. University of California, Los Angeles, 2013
Project: The mechanisms and consequences of CAT tail synthesis

Graduate Student Committees

2011 - 2014 Member, Jason Nielson, University of Utah, PhD/Doctorate Committee
2011 - 2014 Member, Niladri Sinha, University of Utah, PhD/Doctorate Committee
2011 - 2014 Chair, Raghav Kalia, University of Utah, PhD/Doctorate Committee
2011 - 2014 Member, Yan Gao, University of Utah, PhD/Doctorate Committee
2011 - 2014 Member, John Schell, University of Utah, PhD/Doctorate Committee
2011 - 2012 Chair, Seth Lilavivat, University of Utah, PhD/Doctorate Committee
2012 - 2014 Member, Zhizhou Ye, University of Utah, PhD/Doctorate Committee

2012 - 2014	Member, T. Cameron Waller, University of Utah, PhD/Doctorate Committee
2012 - 2014	Member, Edward Hujber, University of Utah, PhD/Doctorate Committee
2012 - 2015	Member, Shigeki Watanabe, University of Utah, PhD/Doctorate Committee
2012 - 2013	Member, Brandon Henrie, University of Utah, PhD/Doctorate Committee
2013 - Present	Chair, Nathaniel Talledge, University of Utah, PhD/Doctorate Committee
2013 - 2014	Member, Kristofor Olson, University of Utah, PhD/Doctorate Committee
2013 - 2013	Member, James Robertson, University of Utah, PhD/Doctorate Committee
2013 - 2013	Member, Sven Miller, University of Utah, PhD/Doctorate Committee
2013 - Present	Member, Kyle Trettin, University of Utah, PhD/Doctorate Committee
2013 - 2014	Member, Kirsten Khoe, University of Utah, PhD/Doctorate Committee
2013 - Present	Member, Valentine Romanov, University of Utah, PhD/Doctorate Committee
2013 - 2014	Member, Madhukar Aryal, University of Utah, PhD/Doctorate Committee
2015 - Present	Member, Benjamin Barad, UCSF, PhD/Doctorate Committee
2015 - Present	Member, Jessica Sherry, UCSF, PhD/Doctorate Committee
2015 - Present	Member, Jordan Tsai, UCSF, PhD/Doctorate Committee
2015 - Present	Member, Kamena Kostova, UCSF, PhD/Doctorate Committee
2015 - Present	Chair, Lillian Kenner, UCSF, PhD/Doctorate Committee
2015 - Present	Chair, Beatriz Osuna, UCSF, PhD/Doctorate Committee
2015 - Present	Member, Aditya Anand, UCSF, PhD/Doctorate Committee
2015 - Present	Member, Eugene Palovcak, UCSF, PhD/Doctorate Committee
2015 - Present	Member, Evan Green, UCSF, PhD/Doctorate Committee
2015 - Present	Member, Valentin Garcia, UCSF, PhD/Doctorate Committee
2015 - Present	Member, Adrienne Stormo, UCSF, PhD/Doctorate Committee

PEER-REVIEWED JOURNAL ARTICLES

1. Hwang, J., Ribbens, D., Raychaudhuri, S., Cairns, L., Gu, H., **Frost, A.,** Urban, S., Espenshade.P.J. (2016) A Golgi rhomboid protease Rbd2 recruits Cdc48 to cleave yeast SREBP. Submitted to the EMBO Journal, March 2016
2. Gu, M.,Chen, O.S., LaJoie, D., Ladinsky, M.S., Michael J. Redd, M.J., Nikolova, L. Bjorkman, P.J., Ullman, K.S., Sundquist, W.I., **Frost, A.** (2016) LEM2 and CHMP7 Function in ESCRT-Dependent Nuclear Envelope Closure in Fission Yeast and Human Cells. Submitted to the EMBO Journal, April 2016. Preprint Deposited in BioRxiv: BIORXIV/2016/049312
3. Heider, M.R., Gu, M. Duffy, C.M., Mirza, A.M., Marcotte, L.L., Walls, A.C., Farrall, N., Hakhverdyan, Z., Field, M.C., Rout, M.P., **Frost, A.**, Munson, M. (2016) Subunit Connectivity, Assembly Determinants, and Architecture of the Yeast Exocyst Complex. **Nature Structure and Molecular Biology** Jan 23(1):59-66. PMID: 26656853
4. McCullough J., Clippinger, A.K., Talledge, N. Skowyra, M.L., Saunders, M.G., Naismith, T.V., Colf, L.A., Afonine, P.A., Arthur, C., Sundquist, W.I.*, Hanson, P.I.*, **Frost A.*** (2015). Structure and Membrane Remodeling Activity of ESCRT-III Helical Polymers. **Science** 350, 1548–51. Co-corresponding authors PMID: 26634441. PMCID: PMC46847693.
5. Shen, S.S., Park, P., Qin, Y., Li, X., Parsawar, P., Larson, M.H., Cox, J., Cheng, Y. Lambowitz, A.L., Weissman, J.S.*, Brandman, J.*, **Frost, A.*** (2015) Rqc2p and 60S ribosomal subunits mediate mRNA-independent elongation of nascent chains. **Science** 347(6217), 75-78 *Co-corresponding authors. PMCID: PMC4451101
6. Koirala S, Guo Q, Kalia R, Bui HT, Eckert DM, **Frost A***, Shaw JM*. (2013). Interchangeable adaptors regulate mitochondrial dynamin assembly for membrane scission. **Proc Natl Acad Sci USA**, *110*(15), E1342-51. *Co-corresponding authors. PMCID: PMC3625255

7. Brandman O, Stewart-Ornstein J, Wong D, Larson A, Williams CC, Li GW, Zhou S, King D, Shen PS, Weibezahn J, Dunn JG, Rouskin S, Inada T, **Frost A***, Weissman JS.* (2012). A ribosome-bound quality control complex triggers degradation of nascent peptides and signals translation stress. **Cell**, *151*(5), 1042-54. *Co-corresponding authors. PMCID: PMC3534965
8. **Frost A***, Elgort MG, Brandman O, Ives C, Collins SR, Miller-Vedam L, Weibezahn J, Hein MY, Poser I, Mann M, Hyman AA, Weissman JS. (2012). Functional repurposing revealed by comparing S. pombe and S. cerevisiae genetic interactions. **Cell**, *149*(6), 1339-52. (Cover) *Corresponding author. PMCID: PMC3613983
9. Mim C, Cui H, Gawronski-Salerno JA, **Frost A**, Lyman E, Voth GA, Unger VM. (2012). Structural basis of membrane bending by the N-BAR protein endophilin. **Cell**, *149*(1), 137-45. PMCID: PMC3319357.
10. Guerrier S, Coutinho-Budd J, Sassa T, Gresset A, Jordan NV, Chen K, Jin WL, **Frost A**, Polleux F. (2009). The F-BAR domain of srGAP2 induces membrane protrusions required for neuronal migration and morphogenesis. **Cell**, *138*(5), 990-1004. PMCID: PMC2797480
Frost A, Perera R, Roux A, Spasov K, Destaing O, Egelman EH, De Camilli P, Unger VM. (2008). Structural basis of membrane invagination by F-BAR domains. **Cell**, *132*(5), 807-17. PMCID: PMC2384079
11. Roux A, Uyhazi K, **Frost A**, De Camilli P. (2006). GTP-dependent twisting of dynamin implicates constriction and tension in membrane fission. **Nature**, *441*(7092), 528-31
12. Lax I, Wong A, Lamothe B, Lee A, **Frost A**, Hawes J, Schlessinger J. (2002). The docking protein FRS2alpha controls a MAP kinase-mediated negative feedback mechanism for signaling by FGF receptors. **Mol Cell**, *10*(4), 709-19.
13. *Cole CD, ***Frost AS**, Thompson N, Cotten M, Cross TA, Busath DD. (2002). Noncontact dipole effects on channel permeation. VI. 5F- and 6F-Trp gramicidin channel currents. **Biophys J**, *83*(4), 1974-86. *these authors contributed equally to this work. PMCID: PMC1302287
14. Jackson ME, **Frost AS**, Moghaddam B. (2001). Stimulation of prefrontal cortex at physiologically relevant frequencies inhibits dopamine release in the nucleus accumbens. **J Neurochem**, *78*(4), 920

REVIEW ARTICLES

1. **Frost A**. (2011). Membrane trafficking: decoding vesicle identity with contrasting chemistries. **Curr Biol**, *21*(19), R811-3.
2. **Frost A**, Unger VM, De Camilli P. (2009). The BAR domain superfamily: membrane-molding macromolecules. **Cell**, 137(2), 191-6.
3. **Frost A**, De Camilli P, Unger VM. (2007). F-BAR proteins join the BAR family fold. **Structure**, 15(7), 751-3.

BOOK CHAPTERS

1. **Frost A**, Unger VM, De Camilli P. (2009) Boomerangs, Bananas and Blimps: Structure and Function of F-BAR Domains in the Context of the BAR Domain Superfamily. http://www.landesbioscience.com/curie/chapter/3985/ http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=eurekah∂=ch3985. In *The Pombe Cdc15 Homology Proteins* (Pontus Aspenström). Landes Biosciences
2. Kalia, R., Talledge, N.T., and **Frost, A.** (2015) Structural and Functional Studies of Membrane Remodeling Machines. **Methods in Cell Biology**, Volume 128, ISSN 0091-679X. http://dx.doi.org/10.1016/bs.mcb.2015.02.007

ORAL PRESENTATIONS

Meeting Presentations (Not Abstracts, Not Posters)

2016 "Hey What's the Big Idea?" Symposium for the Center for Cell and Genome Science, Salt Lake City, UT USA (Keynote)
2016 Mitochondrial Dynamics, Keystone Sympoisum, Steamboat Springs, CO USA
2015 How Do Large GTPases of the Dynamin Family Fission Membranes, Les Treilles, France
2015 Gordon Research Conference, Molecular Membrane Biology, NH USA
2015 Membrane Protein Structures Meeting (MPS 2015), Argonne National Lab, Chicago, IL USA
2014 Molecular Basis for Membrane Remodeling and Organization, Roscoff of Brittany, France
2014 Microscopy of Infectious Disease Agent Symposia (MIDAS), NIH Hamilton MT, USA
2014 Structural Biology Related to HIV/AIDS, NIH, Bethesda, MD USA
2014 Gordon Research Conference, Lysosomes and Endocytosis, NH USA
2014 American Society for Biochemistry and Molecular Biology, San Diego, CA USA
2014 Keystone Symposium, Aging: Pushing the Limits of Cellular Quality Control, Steamboat Springs, CO USA
2013 Synaptic Vesicle Biogenesis, Janelia Farm Research Campus, Virginia USA
2013 Structural Biology Related to HIV/AIDS, NIH, Bethesda, MD
2012 3rd Annual Delaware Membrane Protein Symposium, Newark, DE
2011 Sixth International Fission Yeast Meeting. Harvard University, Boston, MA USA
2008 4th International Conference on Structural Analysis of Supramolecular Assemblies by Hybrid Methods. Lake Tahoe, CA, USA
2007 1st International Conference on PCH/F-BAR Proteins: Adaptor Proteins for Macromolecualr Complexes. Schloβ Waldthausen, Mainz, Germany
2007 61st Annual Meeting of the Symposium of the Society of General Physiologists. Membrane Biophysics of Fusion, Fission, and Rafts in Health and Disease. Marine Biological Laboratory. Woods Hole, MA, USA

Invited/Visiting Professor Presentations

International

2015 12th Annual Horizons in Molecular Biology, Max Plank Institute for Biophysical Chemistry, Göttingen, Germany
2014 Bioimaging at the Nanoscale. Oregon Health Science and the FEI Living Labs 1st Annual Workshop and Conference. Portland, OR USA
2013 Department of Biochemistry Seminar Series, University of Geneva, Geneva, Switzerland
2013 1st Annual Workshop on Cryo-Techniques for Electron Microscopy. Department of Nanochemistry, Instituto Italiano Di Tecnologia, Genova, Italy

National

2016 Department of Molecular Biology, Princeton University, Princeton, NJ USA
2016 Department of Cell Biology, University of Texas, Southwestern Medical Center, Dallas, Texas USA
2015 Department of Molecular Biology, Brigham Young University, Provo, UT USA
2015 Department of Biochemistry, University of Washington, School of Medicine, Seattle, WA USA
2015 Department of Cell Biology, Symposium to Honor James Jamieson, Yale University School of Medicine, New Haven, CT USA

2015 Department of Genetics, Cell & Developmental Biology, and Institute for Regenerative Medicine Seminar Series at the Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA USA
2015 Structural and Quantitative Biology (SQB) Seminar Series, University of California, Berkeley, Berkeley, CA USA
2015 Department of Biochemistry, Weill Medical College of Cornell University, NYC, NY USA
2014 Department of Biomolecular Chemistry, University of Wisconsin-Madison, Madison, WI USA
2014 Department of Biochemistry & Molecular Pharmacology, University of Massachusetts, Worchester, MA USA
2014 Department of Molecular Biosciences, Northwestern University, Evanston, IL USA
2013 Weill Institute for Cell and Molecular Biology, Cornell University, Ithaca, NY
2012 Department of Cell Biology & Molecular Biology Seminar Series, University of Maryland, College Park, MD
2011 Department of Cell Biology, Yale University, New Haven, CT

OTHER SCHOLARLY ACTIVITY

Other Scholarly Activities

2008 "Structural Basis of Bilayer Deformation by Membrane-Associated Scaffolds."
Yale University, Department of Molecular Biophysics & Biochemistry,
Interdepartmental Neuroscience Program
Thesis Advisor: Vinzenz M. Unger, Ph.D., Thesis Co-Advisor: Pietro De Camilli, M.D.
Thesis Committee: Fred Sigworth, Ph.D., Steven Strittmatter, M.D. Ph.D.