CURRICULUM VITAE

Sina Ghaemmaghami, PhD

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Education and Research

McMaster University, Hamilton, ON Canada (1991-1996)
BS, Biochemistry. Graduated with Honors.
Advisor: Dr. Vitai Ananthanarayanan

Duke University, Durham, NC (1996-2001)
Ph.D., Biochemistry
Advisor: Dr. Terrence Oas

Research focus: proteomics and protein folding
Thesis: "Analysis of Protein Stability by Hydrogen Exchange"

University of California, San Francisco (2001-2006)
Postdoctoral Fellow, Department of Cellular & Molecular Pharmacology
Advisor: Dr. Jonathan Weissman

Research focus: proteomics and functional genomics in yeast

University of California, San Francisco (2006-2012)
Adjunct Professor, Institute for Neurodegenerative Diseases
Advisor: Dr. Stanley Prusiner

Research focus: proteomics and prion biology

University of Rochester (2012-present)
Assistant Professor, Department of Biology

Research focus: protein degradation, proteomics, prion biology

Other U of R affiliations: Center for Neural Development and Disease, Biophysics, Structural Biology and Computational Biology Graduate Program, Biochemistry and Molecular Biology Graduate Program, Biological Chemistry Cluster, Director of the University of Rochester Mass Spectrometry Resource Laboratory

Honors and Awards

1991	Ontario Scholarship, Canada
1991-1995	Dean's Honor List, McMaster University, Hamilton, Canada
1995-1996	NSERC (Canada) Undergraduate Industrial Fellowship
1996-1999	NIH Predoctoral Trainee
2001-2002	Howard Hughes Postdoctoral Trainee
2002-2005	NIH Ruth L. Kirschstein Postdoctoral Fellowship
2003-2005	UCSF Postdoctoral Teaching Fellowship
2007-2009	The John Douglas French Alzheimer's Foundation Distinguished Research Scholar Award

2014-2019	NSF Faculty Early Career Development (CAREER) Award
2016	Thermo Scientific / American Society of Mass Spectrometry TMT Innovation Award
2017	Goergen Award for Excellence in Undergraduate Teaching

Professional Organizations and Outside Service

2010-present	American Society for Mass Spectrometry
1996-present	American Association for the Advancement of Science
1996-present	The Protein Society
1996-present	Reviewer for Biochemistry, Analytical Chemistry, Molecular and Cellular Proteomics, Cell Systems, Autophagy, PLOS One and Prion journals
2001-2002, 2005	Howard Hughes Medical Institute
2013-present	Human Proteome Organization
2013-present	Ad-hoc reviewer for the National Science Foundation

Scientific Presentations

2000	Protein Society Symposium, San Diego, CA, (selected speaker)
2001	International Symposium on Mass Spectrometry in the Health and Life Sciences, San Francisco, CA, (poster)
2002	Vanderbilt Genomic Conference, Nashville, TN (poster)
2002	Yeast Genetics and Molecular Biology Meeting, Madison, WI (selected speaker)
2002	American Association of Pharmaceutical Scientists (AAPS) Annual Conference, Toronto, Canada, (invited speaker)
2004	Beyond Genome: Proteomics, San Francisco, CA, (invited speaker)
2004	Duke Symposium on Computational Protein Biology, Durham, NC (invited speaker)
2004	Genentech Research in Progress Series, San Francisco, CA (invited speaker)
2006	Prion Conference, Torino, Italy (poster)
2006-2010	Annual Fairchild Foundation Symposium, San Francisco, CA (invited speaker)
2008	Prion Conference, Madrid, Spain (poster)
2010	Prion Conference, Salzburg, Austria (selected speaker)
2010	Mainz University, Germany, Department of Chemistry (invited speaker)
2011	Prion Conference, Montreal, Canada (selected speaker)
2012	Keystone Symposium, Proteomics and Interactomes, Stockholm, Sweden (selected speaker)
2012	University of Rochester Biophysics Retreat (invited speaker)
2012	University of Rochester Department of Microbiology and Immunology (invited seminar speaker)
2013	Prion Conference, Banff, Canada (selected speaker)
2013	University of Rochester Aging Day (invited speaker)
2013	University of Rochester Department of Biochemistry Retreat (invited speaker)
2013	University of Rochester Chemistry-Biology Cluster Retreat (invited speaker)
2013	The Buck Institute for Research on Aging (invited seminar speaker)
2013	University of Rochester Summer Scholars Program Seminar (invited speaker)
2013	University of Toronto, Tanz Center for Research in Neurodegenerative Disease (invited speaker)
2014	Wilkes University, Department of Chemistry (invited speaker)
2014	University of Rochester Center for Neural Development and Disease Seminar
2014	Human Proteome Organization (invited speaker)
2014	SUNY Geneseo, Department of Chemistry (invited speaker)

2014	Niagara University, Department of Chemistry (invited speaker)
2014	Allegheny College, Department of Biology (invited speaker)
2015	Keystone Symposium, Autophagy, Breckenridge Colorado (poster presentation)
2015	University of Rochester, Department of Biology Donut Talks
2015	University of Rochester Biophysics Retreat (invited speaker)
2015	University of Massachusetts Department of Biochemistry and Molecular Biology (invited speaker)
2016	University of Toronto, Department of Biochemistry (invited speaker)
2016	Broad Institute of Harvard and MIT, Chemical Biology (invited speaker)
2016	University of Rochester Medical Center, The Informatics and Genomics Research Center (TIGR) (invited speaker)
2017	Brigham Young University, Department of Chemistry (invited speaker)

Teaching and mentorship

2012-2017	Advisor to four Ph.D. students and one MS student, degrees obtained by one Ph.D. and one M.S. student
2012-2017	Mentored 21 undergraduates and 2 high school students in various research projects. Two undergraduates were co-authors on published review papers. Two students completed senior theses.
2012-2017	BIO395: Independent Study (supervised ten students to date)
2012-2017	BIO581: Topics in Cellular, Developmental and Molecular Biology (one lecture each year)
2014	BIO516: Cell/Dev/Mol Biology Seminar
2014-2017	IND408: Advanced Biochemistry (two lectures each year)
2014-2017	BIO250H/252: Introduction to Biochemistry-Honors (developed the course)
2016-2017	IND419: Introduction to Quantitative Biology (three lectures each year)

University Service

2012	Departmental Committees: seminar series, faculty search
2013	Departmental Committees: seminar series, departmental retreat
2013-2014	Initiated a program for seminars given by student-invited speakers in the Department of Biology
2013-2014	Proteomics core facility advisory committee
2013-2014	Participated in minority recruitment efforts of the Biochemistry and Molecular Biology programs by at a number of local colleges
2013-2017	Part of thesis and qualification committees of ten Ph.D. students
2013-2016	Biophysics, Structural Biology and Computational Biology Graduate Program selection committee
2014	Internal grant review panels for the Center for AIDS research (CFAR)
2014	Participated in minority graduate student recruitment efforts of the Biochemistry department by giving presentations at a number of local colleges
2014	Participated in Big Data Initiative faculty search as a Biology Department representative
2014	Departmental Committees: seminar series, retreat, faculty search
2014	Center for Excellence in Teaching and Learning (CETL) hiring committee and Student Course Development Projects (SCDP) program participant
2014-2017	Participated in the organization of the Upward Bound program
2015	Participated in McNair Scholarship program

2015	Departmental Committees: seminar series, retreat
2015-2017	Director of the University of Rochester Mass Spectrometry Resource Laboratory, organized a biannual regional mass spectrometry symposium
2017	Departmental faculty search committee

Research Support

Current support

National Science Foundation
MCB-1350165 CAREER (PI: Ghaemmaghami) 1/01/2014 – 12/31/2018
000497-NSF $123,778 Annual Direct
"Career: Global analysis of in vivo protein folding efficiencies by mass spectrometry"

National Institutes of Health
1S100D021486-01 (PI: Ghaemmaghami) 03/15/2016 – 03/14/2017
NIH S10 Shared Instrumentation Award $308,767
"QExactive+ for University of Rochester Proteomics Research"

National Institutes of Health
1 R35 GM119502-01 (PI: Ghaemmaghami) 08/01/2016 – 05/31/2021
000205 - DHHS/PHS/NIH $236,256 Annual Direct
"The prevalence and mechanism of selectivity in basal autophagy

National Institutes of Health
1R01AG057353-01 (PI: Jasper, Co-PI: Ghaemmaghami) 10/01/2017 – 10/01/2022
AG17-057 $326,451 (total) $77,000 (Ghaemmaghami subcontract) Annual Direct
"Proteostasis and metabolism in brain aging"

National Institutes of Health
1S10OD025242-01 (PI: Ghaemmaghami) 02/01/2018 – 02/01/2019
NIH S10 Shared Instrumentation Award $1,081,132
"Orbitrap Fusion Lumos Mass Spectrometer for UR Proteomics Research"

Completed

Collaborative Bioinformatics Pilot Award from Center for Integrative Bioinformatics and Experimental Mathematics (CIBEM)
Quantitative proteomic analysis of influenza-infected mice
[PI: Ghaemmaghami]
(5/1/2013 - 4/30/2015 - $49,282)

Schmitt Program in Integrative Neuroscience (SPIN)
Disrupted protein translation causes astrocyte dysfunction in Vanish White Matter disease
[PI: Pröschel, Ghaemmaghami]
(5/16/2016 - 5/15/2017 - $50,000)

Pending

National Science Foundation
"RCN-UBE Incubator Proteomics Research Experience for Undergraduates"
(PI: Ghaemmaghami) $74,809.00 Annual Direct

Patents:

Quantitative, high-throughput screening method for protein stability (US 7148071 B2)

Methods for detecting modification resistant nucleic acids (US 20100120625 A1)

Isotopic labeling for the measurement of global protein levels and turnover *in vivo* (EP 2582789 A4)

Publications:

1. Wang L., Davis S., Schilling B., Juhasz G., Gibson B., Ramanathan A., Ghaemmaghami S., Jasper H. (2018) A metabolic switch at the center of JNK-induced proteostasis and longevity. ***Aging Cell.*** Under Review.

2. Swovick K, Welle KA, Hryhorenko J, Seluanov A, Gorbunova V, Ghaemmaghami S. (2018) Cross-species comparison of proteome turnover kinetics. ***Molecular & cellular proteomics: MCP***.; PubMed [journal] PMID: 29321186

3. Popa-Wagner A, Sandu RE, Cristin C, Uzoni A, Welle KA, Hryhorenko JR, Ghaemmaghami S. (2018) Increased Degradation Rates in the Components of the Mitochondrial Oxidative Phosphorylation Chain in the Cerebellum of Old Mice. ***Frontiers in aging neuroscience*** 10:32. PubMed [journal] PMID: 29503614,PMCID: PMC5820363

4. Zhang T, Wolfe C, Pierle A, Welle KA, Hryhorenko JR, Ghaemmaghami S. (2017) Proteome-wide modulation of degradation dynamics in response to growth arrest. ***Proceedings of the National Academy of Sciences USA.*** 114(48):E10329-E10338. PubMed [journal] PMID: 29133406, PMCID: PMC5715755

5. Nadtochiy S.M., Wang Y.T., Zhang J., Nehrke K., Schafer X., Welle K., Ghaemmaghami S., Munger J., Brookes P.S.. (2017) Potential mechanisms linking SIRT activity and hypoxic 2-hydroxyglutarate generation: no role for direct enzyme (de)acetylation. ***Biochem J.*** 474(16):2829-39.

6. Shen S, Li J, Zand M, Wu H, Ghaemmaghami S, Qu J (2016) An Ion-Current-Based Temporal Proteomic Profiling of Influenza A Virus Infected Mouse Lungs Revealed Underlying Mechanisms of Altered Integrity of the Lung Microvascular Barrier. ***Journal of Proteome Research.*** Feb 5;15(2):540-53.

7. Zhang T, Shen S, Qu J, Ghaemmaghami S. (2016) Global Analysis of Cellular Protein Flux Quantifies the Selectivity of Basal Autophagy. ***Cell Rep.*** Mar 15;14(10):2426-39.

8. Zhang T, Ghaemmaghami S. (2016) Auophagic Punctum: Global Analysis of Cellular Protein Flux Quantifies the Selectivity of Basal Autophagy. ***Autophagy***. Aug 2;12(8):1411-2.

9. Ghaemmaghami S. (2016) Biology and genetics of PrP prion strains. (invited chapter in “Prion Diseases” Edited by: Stanley Prusiner, Cold Spring Harbor Laboratory Press)

10. Welle K., Zhang T., Hyrohorenko J., Shen S., Qu J., Ghaemmaghami S. (2016) Time-resolved analysis of proteome dynamics by TMT-SILAC hyperplexing ***Mol. Cel. Proteomics*** Dec;15(12):3551-3563.

11. Price JC, Ghaemmaghami S. (2014) Analysis of proteome dynamics in mice by isotopic labeling. ***Methods. Mol. Biol.*** 1156:111-31

12. Ghaemmaghami S, Russo M, Renslo AR. (2014) Successes and Challenges in Phenotype-Based Lead Discovery for Prion Diseases. ***J. Med. Chem.*** Aug 28;57(16):6919-29

13. Zhang T, Nouri E, Li J, Price JC, Hellerstein M, Qu J, Ghaemmaghami S. (2014) Kinetics of precursor labeling in SILAC experiments. ***Anal. Chem***. Nov 18;86(22):11334-41

14. Ghaemmaghami S, Colby DW, Nguyen HO, Hayashi S, Oehler A, DeArmond SJ, Prusiner SB. (2013) Convergent replication of mouse synthetic prion strains. ***Am J Pathol.*** 182(3):866-74

15. Silber BM, Gever JL, Li Z, Gallardo-Godoy A, Renslo AR, Widjaja K, Irwin JJ, Rao S, Jacobson MP, Ghaemmaghami S, Prusiner SB. (2013) Antiprion compounds that reduce PrPSc levels in dividing and stationary-phase cells. ***Bioorgan. Med. Chem.*** 15;21(24):7999-8012

16. Miller-Vedam L, Ghaemmaghami S. (2013) Strain Specificity and Drug Resistance in Anti-Prion Therapy. ***Cur. Top. Med. Chem.*** 13(19):2397-406

17. Friberg KN, Hung G, Wancewicz E, Giles K, Black C, Freier S, Bennett F, DeArmond SJ, Freyman Y, Lessard P, Ghaemmaghami S, Prusiner SB (2012) Intracerebral Infusion of Antisense Oligonucleotides Into Prion-infected Mice. ***Mol. Ther. Nucleic Acids*** 1, e9; doi:10.1038/mtna.2011.6

18. Guan S, Price JC, Ghaemmaghami S, Prusiner SB, Burlingame AL (2012) Compartment modeling for mammalian protein turnover studies by stable isotope metabolic labeling. ***Anal. Chem.*** Mar 23. May 1;84(9):4014-21

19. Ahn M, Ghaemmaghami S, Huang Y, Phuan PW, May BC, Giles K, Dearmond SJ, Prusiner SB. (2012) Pharmacokinetics of Quinacrine Efflux from Mouse Brain via the P-glycoprotein Efflux Transporter. ***PLoS One.*** 7(7):e39112

20. Price JC, Guan S, Burlingame A, Prusiner SB, Ghaemmaghami S (2011) Analysis of proteome dynamics in the mouse brain. ***Proc. Natl. Acad. Sci. USA*** Aug 10;107(32):14508-13

21. Poncet-Montange G, St Martin SJ, Bogatova OV, Prusiner SB, Shoichet BK, Ghaemmaghami S* (2011) A survey of antiprion compounds reveals the prevalence of non-PrP molecular targets. ***J. Biol. Chem.*** Aug 5;286(31):27718-28 (refereed research article)

22. Ghaemmaghami S, Watts J, Nguyen H, Hayashi S, Lemus A, DeArmond SJ and Prusiner SB (2011) Conformational transformation and selection of synthetic prion strains. ***J. Mol. Biol.*** Oct 28;413(3):527-42

23. Guan S, Ghaemmaghami S, Price JC, Prusiner SB, Burlingame AL (2011) A data processing pipeline for mammalian proteome dynamics studies using stable isotope metabolic labeling. ***Mol. Cel. Proteomics*** Dec;10(12):M111.010728

24. Ghaemmaghami S, May BC, Renslo AR, Prusiner SB (2010) Discovery of 2-aminothiazoles as potent antiprion compounds. ***J. Virol.*** Apr; 84(7):3408-12

25. N.T. Ingolia, S. Ghaemmaghami, J.R.S. Newman, and J.S. Weissman (2009) Genome-wide analysis in vivo of translation with nucleotide resolution using ribosome profiling. ***Science*** Apr 10 v324, 218-223

26. Ghaemmaghami S, Ahn M, Lessard P, Giles K, Legname G, DeArmond SJ, Prusiner SB. (2009) Continuous quinacrine treatment results in the formation of drug-resistant prions. ***PLoS Pathog.*** Nov;5(11):e1000673. Epub 2009 Nov 26

27. Ghaemmaghami S, Ullman J, Ahn M, St Martin S, Prusiner SB. (2009) Chemical induction of misfolded prion protein conformers in cell culture. ***J Biol. Chem.*** Apr 2;285(14):10415-23

28. S. Ghaemmaghami, P.W. Phuan, B. Perkins, J. Ullman, B.C. May, F.E. Cohen, S.B. Prusiner (2007) Cell division modulates prion accumulation in cultured cells. ***Proc. Natl. Acad. Sci. USA*** 104, 17971-17976

29. J.R.S. Newman, S. Ghaemmaghami, J. Ihmels, D.K. Breslow, M. Noble, J.L. DeRisi and J.S. Weissman (2006) Single-cell proteomic analysis of *S. cerevisiae* reveals the architecture of biological noise. ***Nature*** 441, 840-846 918

30. R. Howson, W.K. Huh, S. Ghaemmaghami, J.V. Falvo, K. Bower, A. Belle, N. Dephoure, D.D. Wykoff, J.S. Weissman and E.K. O'Shea (2005). Construction, verification, and experimental use of two epitope-tagged collections of budding yeast strains. ***Comp. Funct. Genomics*** 6, 2-16

31. S. Ghaemmaghami, W.K. Huh, K. Bower, R.W. Howson, A. Belle, N. Dephoure, E.K. O'Shea and J.S. Weissman (2003). Global analysis of protein expression in yeast. ***Nature*** 425, 737-741

32. K.D. Powell, S. Ghaemmaghami*, M.Z. Wang, M. Liyuan, T.G. Oas and M.C. Fitzgerald (2002). A general mass spectrometry-based assay for the quantitation of protein-ligand binding interactions in solution. ***J. Am. Chem. Soc.*** 124, 10256-10257

33. S. Ghaemmaghami and T.G. Oas (2001). Quantitative protein stability measurement in vivo. ***Nature Struct. Biol.*** 8, 879-882

34. S. Ghaemmaghami, J.M. Word, R.E. Burton, J.S. Richardson and T.G. Oas (2000). Folding kinetics of a fluorescent variant of monomeric λ repressor. ***Biochemistry*** 37, 9179-918

35. S. Ghaemmaghami, M.C. Fitzgerald and T.G. Oas (2000). A quantitative, high-throughput screen for protein stability. ***Proc. Natl. Acad. Sci. USA*** 97, 8296-8301