

MAJID GHASSEMIAN (Ph.D.)

Director, Biomolecular Mass Spectrometry Facility at UCSD
Department of Chemistry and Biochemistry
Natural Sciences Building (NSB) Rm 4312
University of California, San Diego
9500 Gilman Drive
La Jolla, CA 92093-0378
Ph.858-822-0032
mghassemiian@ucsd.edu
<http://massspec.ucsd.edu/bioms/>

Education & Employment history

Currently (2008-present) Director of the Biomolecular and Proteomics mass spectrometry facility at UCSD and Non senate Faculty Lecturer.

Scientist (2003-2008). Verenum corporation (Diversa Corp): Proteomics facility scientist.

Post-Doctoral (2001-2003) Post-doctoral fellow at Torrey Mesa Research Institute (Syngenta Corp).

Genomics: Large scale metabolite and transcriptional studies of Arabidopsis light response.

Post-Doctoral (1999-2001) Post-Doctoral fellow of National Sciences and Engineering Research Council Of Canada (NSERC), Tenure at University of California-San Diego under the supervision of Dr. Julian I. Schroeder. Genomics: Large scale transcriptional studies of ABA response in Arabidopsis.

Ph.D. (1995-1999) University Of Toronto, Toronto, Canada (Arabidopsis genetics, molecular biology and Developmental biology).

M. Sc. (1993-1995) University Of Toronto, Toronto, Canada (Cyanobacteria Molecular biology and physiology).

B. Sc. (Hon.) (1989-1993) University Of Toronto, Toronto, Canada (Molecular & medical genetics, Microbiology and Plant molecular Biology).

Qualifications and Training:

My professional experience has been centered around research in genomic sciences and more specifically the use of mass spectrometry in biomarker discovery and protein characterization. I currently manage the proteomics core facility at UCSD. The facility is responsible to initiate and conduct proteomic research with researchers on campus and the general scientific community, national and international.

Certified Training:

- ABSCIEX TripleTOF 5600 operations (ABSCIEX).
- Thermo Finnigan TSQ QUANTUM operations (Thermo).
- Thermo LTQ operations (Thermo).
- ABI Qstar Elite operations (ABI).
- ABI 4800 MALDITOFTOF operations (ABI)
- Waters Q-TOF2 operations.
- PERL Certificate (UCSD).
- Introduction to Perl Programming (UCSD).
- Intermediate Perl Programming (UCSD).

- Perl for the WEB.
- SQL Programming (UCSD).
- Introduction to UNIX/Linux (UCSD).
- Advanced Unix shell programming (UCSD).
- Microsoft ACCESS Certificate (New Horizons).
- Basics of protein formulation development (IBC USA).
- HPLC operations (Chromatography institute of America)

Recent Publications

1: Engineer CB, Ghassemian M, Anderson JC, Peck SC, Hu H, Schroeder JI. Corrigendum: Carbonic anhydrases, EPF2 and a novel protease mediate CO₂ control of stomatal development. *Nature*. 2015 Oct 15;526(7573):458. doi: 10.1038/nature14961. Epub 2015 Aug 19. PubMed PMID: 26287465.

2: Gaffney PM, Imai DM, Clifford DL, Ghassemian M, Sasik R, Chang AN, O'Brien TD, Coppinger J, Trejo M, Masliah E, Munson L, Sigurdson C. Proteomic analysis of highly prevalent amyloid A amyloidosis endemic to endangered island foxes. *PLoS One*. 2014 Nov 26;9(11):e113765. doi: 10.1371/journal.pone.0113765. eCollection 2014. PubMed PMID: 25429466; PubMed Central PMCID: PMC4245998.

3: Gaffney PM, Barr B, Rowe JD, Bett C, Drygiannakis I, Giannitti F, Trejo M, Ghassemian M, Martin P, Masliah E, Sigurdson CJ. Protein profiling of isolated uterine AA amyloidosis causing fetal death in goats. *FASEB J*. 2015 Mar;29(3):911-9. doi: 10.1096/fj.14-256081. Epub 2014 Nov 24. PubMed PMID: 25422367.

4: Engineer CB, Ghassemian M, Anderson JC, Peck SC, Hu H, Schroeder JI. Carbonic anhydrases, EPF2 and a novel protease mediate CO₂ control of stomatal development. *Nature*. 2014 Sep 11;513(7517):246-50. doi: 10.1038/nature13452. Epub 2014 Jul 6. Erratum in: *Nature*. 2015 Oct 15;526(7573):458. PubMed PMID: 25043023; PubMed Central PMCID: PMC4274335.

5: Jean C, Chen XL, Nam JO, Tancioni I, Uryu S, Lawson C, Ward KK, Walsh CT, Miller NL, Ghassemian M, Turowski P, Dejana E, Weis S, Cheresch DA, Schlaepfer DD. Inhibition of endothelial FAK activity prevents tumor metastasis by enhancing barrier function. *J Cell Biol*. 2014 Jan 20;204(2):247-63. doi: 10.1083/jcb.201307067. PubMed PMID: 24446483; PubMed Central PMCID: PMC3897185.

6: Meyer JG, Kim S, Maltby DA, Ghassemian M, Bandeira N, Komives EA. Expanding proteome coverage with orthogonal-specificity α -lytic proteases. *Mol Cell Proteomics*. 2014 Mar;13(3):823-35. doi: 10.1074/mcp.M113.034710. Epub 2014 Jan 14. PubMed PMID: 24425750; PubMed Central PMCID: PMC3945911.

7: Stalder D, Mizuno-Yamasaki E, Ghassemian M, Novick PJ. Phosphorylation of the Rab exchange factor Sec2p directs a switch in regulatory binding partners. *Proc Natl Acad Sci U S A*. 2013 Dec 10;110(50):19995-20002. doi: 10.1073/pnas.1320029110. Epub 2013 Nov 18. PubMed PMID: 24248333; PubMed Central PMCID: PMC3864272.

8: Zhang W, Tan W, Wu X, Poustovoitov M, Strasner A, Li W, Borcherding N, Ghassemian M, Karin M. A NIK-IKK α module expands ErbB2-induced tumor-initiating cells by stimulating nuclear export of p27/Kip1. *Cancer Cell*. 2013 May 13;23(5):647-59. doi:

10.1016/j.ccr.2013.03.012. Epub 2013 Apr 18. PubMed PMID: 23602409; PubMed Central PMCID: PMC3981467.

9: Tomar A, Lawson C, Ghassemian M, Schlaepfer DD. Cortactin as a target for FAK in the regulation of focal adhesion dynamics. *PLoS One*. 2012;7(8):e44041. doi: 10.1371/journal.pone.0044041. Epub 2012 Aug 29. PubMed PMID: 22952866; PubMed Central PMCID: PMC3430618.

10: Gamez A, Mukerjea R, Alayyoubi M, Ghassemian M, Ghosh P. Structure and interactions of the cytoplasmic domain of the *Yersinia* type III secretion protein YscD. *J Bacteriol*. 2012 Nov;194(21):5949-58. doi: 10.1128/JB.00513-12. Epub 2012 Aug 31. PubMed PMID: 22942247; PubMed Central PMCID: PMC3486071.

11: Brandt B, Brodsky DE, Xue S, Negi J, Iba K, Kangasjärvi J, Ghassemian M, Stephan AB, Hu H, Schroeder JI. Reconstitution of abscisic acid activation of SLAC1 anion channel by CPK6 and OST1 kinases and branched ABI1 PP2C phosphatase action. *Proc Natl Acad Sci U S A*. 2012 Jun 26;109(26):10593-8. doi: 10.1073/pnas.1116590109. Epub 2012 Jun 11. PubMed PMID: 22689970; PubMed Central PMCID: PMC3387046.

12: Guo L, Ghassemian M, Komives EA, Russell P. Cadmium-induced proteome remodeling regulated by Spc1/Sty1 and Zip1 in fission yeast. *Toxicol Sci*. 2012 Sep;129(1):200-12. doi: 10.1093/toxsci/kfs179. Epub 2012 May 18. PubMed PMID: 22610605; PubMed Central PMCID: PMC3713068.

13: Lin C, Ear J, Pavlova Y, Mittal Y, Kufareva I, Ghassemian M, Abagyan R, Garcia-Marcos M, Ghosh P. Tyrosine phosphorylation of the Gα-interacting protein GIV promotes activation of phosphoinositide 3-kinase during cell migration. *Sci Signal*. 2011 Sep 27;4(192):ra64. doi: 10.1126/scisignal.2002049. PubMed PMID: 21954290; PubMed Central PMCID: PMC4226136.

14: Lord C, Bhandari D, Menon S, Ghassemian M, Nycz D, Hay J, Ghosh P, Ferro-Novick S. Sequential interactions with Sec23 control the direction of vesicle traffic. *Nature*. 2011 May 12;473(7346):181-6. doi: 10.1038/nature09969. Epub 2011 May 1. PubMed PMID: 21532587; PubMed Central PMCID: PMC3093450.

15: Brunn ND, Dibrov SM, Kao MB, Ghassemian M, Hermann T. Analysis of mRNA recognition by human thymidylate synthase. *Biosci Rep*. 2014 Dec 23;34(6):e00168. doi: 10.1042/BSR20140137. PubMed PMID: 25423174; PubMed Central PMCID: PMC4274661.

16: Sheikh F, Ouyang K, Campbell SG, Lyon RC, Chuang J, Fitzsimons D, Tangney J, Hidalgo CG, Chung CS, Cheng H, Dalton ND, Gu Y, Kasahara H, Ghassemian M, Omens JH, Peterson KL, Granzier HL, Moss RL, McCulloch AD, Chen J. Mouse and computational models link Mlc2v dephosphorylation to altered myosin kinetics in early cardiac disease. *J Clin Invest*. 2012 Apr;122(4):1209-21. doi: 10.1172/JCI61134. Epub 2012 Mar 19. PubMed PMID: 22426213; PubMed Central PMCID: PMC3314469.

17: Lin C, Ear J, Pavlova Y, Mittal Y, Kufareva I, Ghassemian M, Abagyan R, Garcia-Marcos M, Ghosh P. Tyrosine phosphorylation of the Gα-interacting protein GIV promotes activation of phosphoinositide 3-kinase during cell migration. *Sci Signal*. 2011 Sep 27;4(192):ra64. doi: 10.1126/scisignal.2002049. PubMed PMID: 21954290.

18: Lord C, Bhandari D, Menon S, Ghassemian M, Nycz D, Hay J, Ghosh P, Ferro-Novick S. Sequential interactions with Sec23 control the direction of vesicle traffic. *Nature*. 2011 May 12;473(7346):181-6. doi: 10.1038/nature09969. Epub 2011 May 1. PubMed PMID: 21532587; PubMed Central PMCID: PMC3093450.

19: Bruand J, Sistla S, Mériaux C, Dorrestein PC, Gaasterland T, Ghassemian M, Wisztorski M, Fournier I, Salzet M, Macagno E, Bafna V. Automated querying and identification of novel peptides using MALDI mass spectrometric imaging. *J Proteome Res*. 2011 Apr 1;10(4):1915-28. doi: 10.1021/pr101159e. Epub 2011 Mar 15. PubMed PMID: 21332220.

20: Aung A, Gupta G, Majid G, Varghese S. Osteoarthritic chondrocyte-secreted morphogens induce chondrogenic differentiation of human mesenchymal stem cells. *Arthritis Rheum*. 2011 Jan;63(1):148-58. doi: 10.1002/art.30086. PubMed PMID: 20954186.

21: Guttman M, Betts GN, Barnes H, Ghassemian M, van der Geer P, Komives EA. Interactions of the NPXY microdomains of the low density lipoprotein receptor-related protein 1. *Proteomics*. 2009 Nov;9(22):5016-28. doi: 10.1002/pmic.200900457. PubMed PMID: 19771558; PubMed Central PMCID: PMC2862490.

22: Ng J, Bandeira N, Liu WT, Ghassemian M, Simmons TL, Gerwick WH, Lington R, Dorrestein PC, Pevzner PA. Dereplication and de novo sequencing of nonribosomal peptides. *Nat Methods*. 2009 Aug;6(8):596-9. doi: 10.1038/nmeth.1350. Epub 2009 Jul 13. PubMed PMID: 19597502; PubMed Central PMCID: PMC2754211.

23: Ghassemian M, Lutes J, Chang HS, Lange I, Chen W, Zhu T, Wang X, Lange BM. Abscisic acid-induced modulation of metabolic and redox control pathways in *Arabidopsis thaliana*. *Phytochemistry*. 2008 Dec;69(17):2899-911. doi: 10.1016/j.phytochem.2008.09.020. Epub 2008 Nov 12. PubMed PMID: 19007950.

24: Warnecke F, Luginbühl P, Ivanova N, Ghassemian M, Richardson TH, Stege JT, Cayouette M, McHardy AC, Djordjevic G, Aboushadi N, Sorek R, Tringe SG, Podar M, Martin HG, Kunin V, Dalevi D, Madejska J, Kirton E, Platt D, Szeto E, Salamov A, Barry K, Mikhailova N, Kyrpides NC, Matson EG, Ottesen EA, Zhang X, Hernández M, Murillo C, Acosta LG, Rigoutsos I, Tamayo G, Green BD, Chang C, Rubin EM, Mathur EJ, Robertson DE, Hugenholtz P, Leadbetter JR. Metagenomic and functional analysis of hindgut microbiota of a wood-feeding higher termite. *Nature*. 2007 Nov 22;450(7169):560-5. PubMed PMID: 18033299.

25: Ghassemian M, Lutes J, Tepperman JM, Chang HS, Zhu T, Wang X, Quail PH, Lange BM. Integrative analysis of transcript and metabolite profiling data sets to evaluate the regulation of biochemical pathways during photomorphogenesis. *Arch Biochem Biophys*. 2006 Apr 15;448(1-2):45-59. Epub 2006 Jan 20. PubMed PMID: 16460663.

26: Lange BM, Ghassemian M. Comprehensive post-genomic data analysis approaches integrating biochemical pathway maps. *Phytochemistry*. 2005 Feb;66(4):413-51. Review. PubMed PMID: 15694451.

27: Lange BM, Ghassemian M. Genome organization in *Arabidopsis thaliana*: a survey for genes involved in isoprenoid and chlorophyll metabolism. *Plant Mol Biol*. 2003 Apr;51(6):925-48. PubMed PMID: 12777052.

28: Ghassemian M, Waner D, Tchiew J, Gribskov M, Schroeder JI. An integrated *Arabidopsis* annotation database for Affymetrix Genechip data analysis, and tools for regulatory motif searches. *Trends Plant Sci*. 2001 Oct;6(10):448-9. PubMed PMID: 11590042.

29: Ghassemian M, Nambara E, Cutler S, Kawaide H, Kamiya Y, McCourt P. Regulation of abscisic acid signaling by the ethylene response pathway in *Arabidopsis*. *Plant Cell*. 2000 Jul;12(7):1117-26. PubMed PMID: 10899978; PubMed Central PMCID: PMC149053.

30: Pei ZM, Ghassemian M, Kwak CM, McCourt P, Schroeder JI. Role of farnesyltransferase in ABA regulation of guard cell anion channels and plant water loss. *Science*. 1998 Oct 9;282(5387):287-90. PubMed PMID: 9765153.

31: Cutler S, Ghassemian M, Bonetta D, Cooney S, McCourt P. A protein farnesyl transferase involved in abscisic acid signal transduction in *Arabidopsis*. *Science*. 1996 Aug 30;273(5279):1239-41. PubMed PMID: 8703061.

32: Ghassemian M, Wong B, Ferreira F, Markley JL, Straus NA. Cloning, sequencing and transcriptional studies of the genes for cytochrome c-553 and plastocyanin from *Anabaena* sp. PCC 7120. *Microbiology*. 1994 May;140 (Pt 5):1151-9. PubMed PMID: 8025680.

33: Ghassemian M, Straus NA. Fur regulates the expression of iron-stress genes in the cyanobacterium *Synechococcus* sp. strain PCC 7942. *Microbiology*. 1996 Jun;142 (Pt 6):1469-76. PubMed PMID: 8704986.