

# INDRANEEL GHOSH

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## EDUCATION

B. S. in Chemistry, May 1992, Hobart College, Geneva, NY  
Research Advisor: Professor David Craig

Ph. D. in Chemistry, May 1998, Purdue University, West Lafayette, IN  
Dissertation Title: "*Dimerization and Dissociation Studies of the Basic-Helix-Loop-Helix Transcription Factors, E47 and Tal*" Thesis Advisor: Professor Jean A. Chmielewski

## EMPLOYMENT

2011-                    Professor, Department of Chemistry & Biochemistry  
*University of Arizona, Tucson, AZ*

2008-                    Emily & Homer Weed Endowed Chair, Dept. of Chemistry & Biochemistry  
*University of Arizona, Tucson, AZ*

2008                    Co-Founder and Chief Scientific Officer, Luceome Biotechnologies, Tucson, AZ

2007-2011            Associate Professor, Department of Chemistry (& Biochemistry, 2008)  
*University of Arizona, Tucson, AZ*

2001-2007            Assistant Professor, Department of Chemistry,  
*University of Arizona, Tucson, AZ*

1998-2001            Postdoctoral Fellow, *Yale University*, New Haven, CT  
Professor Andrew D. Hamilton and Professor Lynne Regan

## HONORS/AWARDS/SERVICE

2011                    Outstanding Faculty Award for Excellence in Teaching, Honors College, University of Arizona

2011-present        Honors Professor, Honors College, University of Arizona

2011                    Member, NIH Directors Pioneer Award Panel

2010-2014            Member, National Institutes of Health, Synthetic and Biological Chemistry B Panel

2006-2011            NSF CAREER Award

2002                    Research Innovation Award, Research Corporation

2002                    Petroleum Research Foundation: Type G New Faculty Award

2002                    Invited Junior Investigator Presentation, Peptide GRC

1999-2002            Leukemia and Lymphoma Society Fellow

1994                    Purdue Research Foundation Fellowship

1990                    Sigma Xi, Hobart College

1992                    Ralph H. Bullard prize in Chemistry, Hobart College

1988-1992            Hobart Scholarship (Full tuition)

**PUBLICATIONS INCLUDING REVIEWS (Chronological order)**

\*Indicates publications substantially based on work prior to initial faculty appointment, i.e. as a graduate student or postdoctoral fellow

- 1.\* Bishop, P.; Ghosh, I.; Jones, C.; Chmielewski, J. "The Basic-Helix-Loop-Helix region of Tal: Evaluation of structure and DNA affinity"  
*J. Am. Chem. Soc.* **1995**, 117, 8283-8284
- 2.\* Bishop, P.; Jones, C.; Ghosh, I.; Chmielewski, J. "The Basic-Helix-Loop-Helix Region of IEB E47: Evaluation of structure and DNA affinity"  
*Int. J. Peptide and Protein Res.* **1995**, 46, 149-151
- 3.\* Yao, S.; Ghosh, I.; Zutshi, R.; Chmielewski, J. "A pH-modulated, self-replicating peptide"  
*J. Am. Chem. Soc.* **1997**, 119, 10559-10560
- 4.\* Ghosh, I.; Yao, S.; Chmielewski, J., "DNA binding peptides"  
*Comprehensive Natural Products Chemistry*, Vol. 7, **1998**, 477-490
- 5.\* Yao, S.; Ghosh, I.; Zutshi, R.; Chmielewski, J. "Self-replicating peptide under ionic control"  
*Angew. Chem. Int. Ed. Eng.*, **1998**, 37, 478-481
- 6.\* Yao, S.; Ghosh, I.; Chmielewski, J.; "Natural selection in self-replicating peptides"  
*Peptides: Chemistry, Structure and Biology*, **1998**, 15, 366-368
- 7.\* Yao, S.; Ghosh, I.; Zutshi, R.; Chmielewski, J. "Selective amplification via Auto- and Cross-catalysis in a replicating peptide system"  
*Nature*, **1998**, 396, 447-450
- 8.\* Ghosh, I.; Chmielewski, J. "A beta-Sheet Inhibitor of IEB E47-dimerization and DNA binding"  
*Chem. Biol.*, **1998**, 5, 439-445
- 9.\* Ghosh, I.; Issac, R.; Chmielewski, J. "Structure-function relationship in a beta-sheet peptide inhibitor of E47 dimerization and DNA binding"  
*Bioorg. Med. Chem.*, **1999**, 7, 61-66
- 10.\* Ma, Y. S.; Cunningham, M. E.; Ghosh, I.; Regan, L.; Longley, B. J. "Inhibition of spontaneous receptor phosphorylation by residues in a putative alpha-helix in the KIT intracellular juxtamembrane region"  
*J. Biol. Chem.*, **1999**, 274, 13399-13402
- 11.\* Ghosh, I.; Hamilton, A. D.; Regan, L. "Leucine Zipper Assisted Protein Reassembly: Application to the Green Fluorescent Protein,"  
*J. Am. Chem. Soc.*, **2000**, 122, 5658-5659
- 12.\* Ghosh, I.; Bishop, P.; Chmielewski, J. "DNA binding properties of basic-helix-loop-helix fusion proteins of Tal and E47"  
*J. Pept. Res.*, **2001**, 57, 354-360

**University of Arizona**

Corresponding Author(s) **bold** & <sup>±</sup>High-school and undergraduate student co-authors on publications

13. Zhou, M; **Ghosh, I.** "Helical supramolecules and fibers utilizing leucine-zipper displaying dendrimers"  
*J. Am. Chem. Soc.*, **2004**, 126, 734-735  
Research Highlighted in *Chem. & Eng. News*, 2004, 82, 41.

14. Rajagopal, S; Meza-Romero, R; **Ghosh, I.** "Dual surface selection methodology for the identification of thrombin binding epitopes from hotspot biased phage-display libraries"  
*Bioorg. Med. Chem. Lett.*, **2004**, 16, 1389-1393  
*Featured 2004 Journal Cover*
15. Zhou, M.; **Ghosh, I.**, "Non-covalent Multivalent Assembly of Jun Peptides on a Leucine Zipper Dendrimer Displaying Fos Peptides"  
*Org. Lett.*, **2004**, 6, 3561-3564
16. **Ghosh, I.; Chmielewski, J.** "Peptide self-assembly as a model of proteins in the pre-genomic world"  
*Curr. Opin. Chem. Biol.* **2004**, 8, 640-644
17. **Ghosh, I.** "Celebrating Victor Hruby's 65th birthday: An Odyssey in Chemistry and Biology"  
*Med Res Rev*, **2005**, 25:487-489  
*Forward for Special Issue (Not Peer Reviewed)*
18. Meyer, S.C.; <sup>±</sup> Huerta, C.; **Ghosh, I.**, "Single-Site Mutations in a Hyperthermophilic Variant of the B1 Domain of Protein G Result in Self-Assembled Oligomers"  
*Biochemistry*, **2005**, 44, 2360-2368
- 19.\* Magliery, T.; Wilson C. M, Pan, W.; Mishler, D. I.; Ghosh, I.; Hamilton, A.D.; **Regan, L.** "The scope and mechanism of the GFP fragment-reassembly protein-protein interaction trap"  
*J. Am. Chem. Soc.* **2005**, 127, 146-157
20. Stains, C.A.; Porter, J.R.; Ooi, A. T.; **Segal, D. J.; Ghosh, I.** "DNA Sequence-Enabled Reassembly of the Green Fluorescent Protein"  
*J. Am. Chem. Soc.* **2005**, 127, 10782-10783  
*Featured write-up in Nature Methods "DNA Makes GFP Shine" 2005, 2, 644*
21. Ooi, A. T.; Stains, C.A.; Porter, J. R.; **Ghosh, I.; Segal, D. J.** " Sequence-Enabled Reassembly (SEER) of Peptides for the Detection of DNA Sequences "  
*Proc. Am. Pep. Soc.*, 9, **2005**, 214-215
22. Ooi, A. T.; Stains, C.A.; **Ghosh, I.; Segal, D. J.** "SEquence-Enabled Reassembly of beta-Lactamase (SEER-LAC): a Sensitive Method for the Detection of Double-Stranded DNA"  
*Biochemistry* **2006**, 46, 3620-3625
23. Meyer, S. C.; <sup>±</sup> Gaj, T.; **Ghosh, I.** "Highly Selective Cyclic Peptide Ligands for NeutrAvidin and Avidin Identified by Phage Display"  
*Chem. Biol. & Drug Des.* **2006**, 68, 3-10  
*Featured Journal Cover*
24. Stains, C.A.; Furman, J.; Segal, D. J.; **Ghosh, I.** "Site Specific Detection of DNA Methylation utilizing mCpG-SEER"  
*J. Am. Chem. Soc.* **2006**, 128, 9761-9765
25. Rajagopal, S; Meyer, S. C.; <sup>±</sup> Goldman, A.; Zhou, M.; **Ghosh, I.** "A Minimalist Approach for Protein Recognition by Epitope Transfer from Functionally Evolved Beta-Sheet Surfaces"  
*J. Am. Chem. Soc.*, **2006**, 128, 14356-14363
26. **Ghosh, I.** Stains, C. A. Ooi, A. T. **Segal, D. J.** "Direct Detection of Double-Stranded DNA: Molecular Methods and Applications for DNA Diagnostics"  
*Mol. BioSys.*, **2006**, 2, 551-560

27. <sup>‡</sup> Smith, T. J.; Stains, C.A.; Meyer, S.C.; **Ghosh, I.** "Inhibition of  $\beta$ -Amyloid Fibrillization by Directed Evolution of a  $\beta$ -Sheet Presenting Miniature Protein"  
*J. Am. Chem. Soc.*, **2006**, 128, 14456-14457
28. Tokimoto, T.; Bethea, T.R.C.; Zhou, M.; Ghosh, I.; **Wirth, M.J.** "Probing orientations of single fluorescent labels on a peptide reversibly binding to the human delta-opioid receptor"  
*Applied Spectroscopy*, **2007**, 61, 130-137
29. Stains, C. I.; **Ghosh, I.** "When Conjugated Polymers meet Amyloid Fibrils"  
*ACS Chem. Biol.*, **2007**, 2, 525-528 (Invited, Review)
30. Zhou, M.; **Ghosh, I.** "Quantum Dots and Peptides: A Bright Future Together,"  
*Biopolymers*, **2007**, 88, 325-339
31. Zhou, M.; <sup>‡</sup>Nakatani, E.; <sup>‡</sup>Gronenberg, L.S.; Tokimoto, T.; Wirth, M.J.; Hrubby, V.J.; Roberts, A.; Lynch, R.M.; **Ghosh, I.** "Peptide-Labeled Quantum Dots for Imaging GPCRs in Whole Cells and as Single Molecules,"  
*Bioconjugate Chem.*, **2007**, 18, 323 -332
32. **Ghosh, I.**; Wirth M.J. "Parsing the Motion of Single Molecules: A Novel Algorithm for Deconvoluting the Dynamics of Individual Receptors at the Cell Surface,"  
*Science's STKE*, **2007**, [DOI: 10.1126/stke.3882007pe28] (Invited, Review)
33. <sup>‡</sup> Gaj, T.; Meyer, S.C.; **Ghosh, I.** "The AviD-tag, a NeutrAvidin/avidin Specific Peptide Affinity Tag for the Immobilization and Purification of Recombinant Proteins"  
*Protein Expression & Purification*, **2007**, 56, 54-61
34. Porter, J.R.; Stains, C.I.; Segal, D.J.; **Ghosh, I.** "Split beta-Lactamase Sensor for the Sequence-Specific Detection of DNA Methylation"  
*Analytical Chemistry*, **2007**, 79, 6702-6708
35. Stains, C.I.; Mondal, K.; **Ghosh, I.** "Molecules that Target beta-Amyloid"  
*ChemMedChem*, **2007**, 2, 1674-1692
36. Meyer, S.C.; Shomin, C.D.; <sup>‡</sup>Gaj, T.; **Ghosh, I.** "Tethering Small Molecules to a Phage Display Library: Discovery of a Selective Bivalent Inhibitor of Protein Kinase A"  
*J. Am. Chem. Soc.*, **2007**, 129, 13812-13813  
*Featured write-up in Molecular BioSystems and in ACS Chemical Biology*
37. Porter, J.R.; Stains, C. I.; Jester, B.; **Ghosh, I.** "A General and Rapid Cell-Free Approach for the Interrogation of Protein-Protein, Protein-DNA and Protein-RNA Interactions and their Antagonists Utilizing Split-Protein Reporters"  
*J. Am. Chem. Soc.*, **2008**, 130, 6488-6497
38. Deng, Z.; Lie, L.F.; Shen, S.; Ghosh, I.; Mansuripur, M; **Muscat, A.J.** "Water-Based Route to Ligand-Selective Synthesis of ZnSe and Cd-Doped ZnSe Quantum Dots with Tunable Ultraviolet A to Blue Photoluminescence"  
*Langmuir*, **2009**, 25, 434-442
39. Furman, J.L.; <sup>‡</sup>Badran, A.H.; Shen, S.; Stains, C.I.; <sup>‡</sup>Hannallah, J.; Segal D.J.; **Ghosh, I.** "Systematic Evaluation of Split-fluorescent Proteins for the Direct Detection of Native and Methylated DNA"  
*Bioorg. Med. Chem. Lett.*, **2009**, 19, 3748-3751

40. Shomin, C.D.; Meyer, S.C.; **Ghosh, I.** “Staurosporine Tethered Peptide Ligands that Target cAMP-Dependent Protein Kinase (PKA): Optimization and Selectivity Profiling” *Bioorg. Med. Chem.*, **2009**, 17, 6196-6202
41. Shekhawat, S.S.; Porter, J.R.; <sup>‡</sup>Sriprasad, A.; **Ghosh, I.** “An Autoinhibited Coiled-Coil Design Strategy for Split-Protein Protease Sensors” *J. Am. Chem. Soc.*, **2009**, 131, 5284-5290
42. Meyer, S.C.; **Ghosh, I.** “Phage Display Technology in Biosensor Development” In *Recognition Receptors in Biosensors*; Zourob, M., Ed. Springer: New York; **2010**, 723-751 (*Invited, Chapter*)
43. Porter J.R.; Lockwood S.H.; **Segal, D.J.**; **Ghosh, I.** “*Seeing Genetic and Epigenetic Information without DNA Denaturation Using Sequence Enabled Reassembly (SEER)*” In *Engineered Zinc Finger Proteins: Protocols and Methods*; Segal, D. J. and Mackay, J., Ed. *Methods in Molecular Biology* 649, Springer: New York; **2010**
44. Yu, Y.; **Blair, S.**; Gillespie, D.; Jensen, R.; Myszka, D.; <sup>‡</sup>Badran, A.H.; Ghosh, I.; Chagovetz, A. “Direct DNA Methylation Profiling Using Methyl Binding Domain Proteins” *Analytical Chemistry*, **2010**, 82, 5012–5019
45. Jester, B.W.; <sup>‡</sup>Cox, K.J.; <sup>‡</sup>Gaj, A.; Shomin, C.D.; Porter, J.R.; **Ghosh, I.** “A Coiled Coil Enabled Split-Luciferase Three-Hybrid System: Applied Toward Profiling Inhibitors of Protein Kinases” *J. Am. Chem. Soc.*, **2010**, 132, 11727-11735
46. Furman, J.L.; <sup>‡</sup>Badran, A.H.; <sup>‡</sup>Oluyomi, A.; Porter, J.R.; Stains, C.I.; Segal, D.J.; **Ghosh, I.** “A General Approach toward RNA-Templated Hierarchical Assembly of Split-Proteins” *J. Am. Chem. Soc.*, **2010**, 132, 11692-11701
47. Stains, C.I.; Furman, J.L.; Porter, J.R.; Rajagopal, S.; Yuxing, L.; Wyatt, R.T.; **Ghosh, I.** “Toward a General Approach for the Direct Detection of Native Proteins utilizing Split-Luciferase Reassembly: Applied to VEGF, gp120, and Her2” *ACS Chem. Biol.*, **2010**, 5, 943-952
48. Henchey, L.K.; Porter, J.R.; **Ghosh, I.**; **Arora, P.S.** “High Specificity in Protein Recognition by Hydrogen Bond Surrogate  $\alpha$ -Helices: Selective Inhibition of the p53/MDM2 Complex” *ChemBioChem*, **2010**, 11, 2104-2107
49. Porter, J. R; <sup>‡</sup>Helmers, M.H.; Wang, P.; Furman, J.L.; Arora, P.S.; **Ghosh, I.** "Profiling Small Molecule Inhibitors against Helix-Receptor Interactions: The Bcl-2 Family Inhibitor BH3I-1 Potently Inhibits p53/hDM2" *Chem. Commun.*, **2010**, 46, 8020-8022
50. Furman, J.L.; Mok, P.W.; Shen, S.; Stains, C.I.; **Ghosh, I.** “A Turn-on Split-luciferase Sensor for the Direct Detection of Poly(ADP-ribose) as a Marker for DNA Repair and Cell Death” *Chem. Commun.*, **2011**, 47, 397-399
51. <sup>‡</sup>Kox, K.J.; Shomin, C.D.; **Ghosh, I.** "Tinkering outside the kinase ATP box: allosteric (type IV) and bivalent (type V) inhibitors of protein kinases" *Future Med. Chem.*, **2011**, 3, 29-43
52. Shekhawat, S.S.; Campbell, S. .; **Ghosh, I.** “Analysis of a Comprehensive Panel of Genetically Encoded Turn-on Split-Luciferase Sensors for Caspase-1 through Caspase-10” *ChemBioChem*, **2011**, 12, 2353-2364

53. Furman, J. L.; Mok, P. W.; <sup>‡</sup>Badran, A.H.; Porter, J.R.; **Ghosh, I.** “Turn-on DNA Damage Sensors for the Direct Detection of 8-Oxoguanine and Photoproducts in Native DNA”  
*J. Am. Chem. Soc.*, **2011**, 133, 12518-12527  
*Featured Journal Cover*
54. <sup>‡</sup>Badran, A.H.; Furman, J.L.; <sup>‡</sup>Ma, A.; Porter, J.R.; <sup>‡</sup>Comi, T.J.; **Ghosh, I.** “Evaluating the Global CpG Methylation Status of Native DNA Utilizing a Bipartite Split-Luciferase Sensor”  
*Analytical Chemistry*, **2011**, 83, 7151-7157
55. Shomin, C.D.; <sup>‡</sup>Cox, K.J.; Restituyo, E.R.; **Ghosh, I.** “Selection of Cyclic-Peptides against Aurora Kinase A: Problems and Solutions”  
*Bioorg. Med. Chem.*, **2011**, 19, 6743-6749
56. Shekhawat, S. S.; **Ghosh, I.** “Split-Protein Systems: Beyond Binary Protein-Protein Interactions”  
*Current Opinion in Chemical Biology*, **2011**, 15, 789-797
57. Jester, B.W.; <sup>‡</sup>Gaj, A.; Shomin, C.D.; <sup>‡</sup>Cox, K.J.; **Ghosh, I.** “Testing the Promiscuity of Commercial Kinase Inhibitors against the AGC Kinase Group Using a Split-luciferase Screen”  
*J. Med Chem.*, **2012**, 55, 1526-1537
58. Lamba, V.; **Ghosh, I.** “New Directions in Targeting Protein Kinases: Focusing Upon True Allosteric and Bivalent Inhibitors”  
*Curr. Pharm. Design*, **2012**, 18, 2936-2945
59. Ogunleye, L.; Jester, B. W.; Riemen, A.J.; Badran, A. H.; Wang, P. **Ghosh, I.** “When tight is too tight: Dasatinib and its lower affinity analogue for profiling kinase inhibitors in a three-hybrid split-luciferase system”  
*Med. Chem. Comm.*, **2014**, 5, 328-332
60. Camacho-Soto K.; Castillo-Montaya, J.; Tye, B. W.; **Ghosh, I.** “Ligand-Gated Split-Kinases”  
*J. Am. Chem. Soc.*, **2014**, 136, 3995-4002
61. Camacho-Soto K.; Castillo-Montaya, J.; Tye, B. W.; **Ghosh, I.** “Small Molecule Gated Split-Tyrosine Phosphatases and Orthogonal Split-Tyrosine Kinases”  
*J. Am. Chem. Soc.*, **2014**, 136, 17078-17086
62. Restituyo, E.; Camacho-Soto, K.; Ghosh, I. “A Fragment Based Selection Approach for the Discovery of Peptide Macrocycles Targeting Protein Kinases”  
*Methods in Molecular Biology* **2015** Springer: New York; Vol, 1248, 95-104 (R. Derda; Editor)
63. Campbell, S.; Carlson, K.; Helmers, M.; Buchholz, C.; **Ghosh, I.** “Mapping the BH3 Binding Interface of Bcl-xL, Bcl-2, and Mcl-1 using Split-Luciferase Reassembly” *Biochemistry*, **2015**, 54, 2632-2643

#### Book Reviews

64. **Ghosh, I.** Creative Chemical Sensor Systems *J. Am. Chem. Soc.* **2008**, 130, 4570-4571
65. **Ghosh, I.** Quantum Dots: Applications in Biology *ChemBioChem*, **2008**, 9, 157-158

#### Work to be submitted

66. Campbell, S.; **Ghosh, I.** “Split-Protein Methods – A Users Guide”

67. Castillo-Montaya, J.; **Ghosh, I.** "Kinase Polypharmacology"
68. Mondal, K.; Shen, S.; Porter, J.R.; Shekhawat, S.S.; **Ghosh, I.** "Parsing Intermediates in Amyloid Aggregation utilizing Promiscuous Anti-Amyloid Binding Proteins"
69. Wang, P.; Zhou, M.; Nakatani, E.; Wellensiek, B.; Ahmed, N.; **Ghosh, I.** "Trivalent picomolar Inhibitors Targeting the HIV-1 gp120 capsid protein"
70. Lamba, V.; Cox, K.J.; **Ghosh, I.** "Probing the Generality of the Selection of Bivalent Inhibitors Targeting Protein Kinases"
71. Camacho-Soto, K.; **Ghosh, I.** "Transformation of a Kinase Activator to a Bivalent Inhibitor"
72. Mok, P.W.; Ma, A.; Riemen, A.; **Ghosh, I.** "A Systematic Alanine Scan of MBD1 using a Split-Luciferase Screen"
73. Rieman, A.; Mok, P.W.; **Ghosh, I.** "Redesigning mCpG binding Proteins – the importance of residues outside the mCpG recognition site"
74. Castillo-Montoya, J.; Jester, B. W.; **Ghosh, I.** "Probing Inhibitor binding pockets of Tyrosine Kinase using a Split-Luciferase Screen"

#### Patents

1. Ghosh, I. with Hamilton, A.D.; Regan, L. "Methods of detecting interactions between proteins, peptides or libraries thereof using fusion proteins" 2004 *US Patent* 6,780,599
2. Ghosh, I. with Segal, D.J.; Stains, C.; Porter, J. R.; Ooi, A. T. Barbas, C.F. "Sequence Enabled Reassembly (SEER)- A Novel Method for Visualizing Specific DNA Sequences" *US Patent Application* 2006 PCT/US2006/017425
3. Ghosh, I. with Meyer, S.C.; Gaj, T. "Peptide Motifs for Binding Avidin and Neutravidin" *US Provisional Patent Application* 2007 11/808532
4. Ghosh, I. with Stains, C.I.; Porter, J.R.; Jester, B.W.; Furman, J.L. "Cell Free Methods for Detecting Protein-Ligand Interactions" *US and International Patent Application* 2009 PCT/US2008/012375

#### SCHOLARLY PRESENTATIONS (2005–PRESENT)

1. Department of Pharmacy, University of Michigan, Ann Arbor, MI, **2016**
2. American Chemical Society National Meeting, , Philadelphia, PA **2016**
3. Department of Chemistry, Virginia Tech, Blacksburg, VA, **2015**
4. Molecular Engineering and Science Institute, University of Washington, Seattle, WA, **2015**
5. Eindhoven University of Technology, Eindhoven, Netherlands, **2015**
6. Dept. of Chemistry, University of Nebraska, Lincoln, NE, **2013**
7. Dept. of Epply Institute, University of Nebraska Medical Center, Omaha, NE, **2013**
8. Dept. of Chemistry and Biochemistry, University of Arizona, AZ, **2013** (*Homer & Emily Weed Symposium*)
9. Dept. of Pharmacology & Toxicology, University of Arizona, AZ, **2012**
10. Chemical Biology Program, University of Minnesota, Minneapolis, MN, **2011**
11. Dept. of Chemistry, Univ. of California, Irvine, CA, **2011**
12. Frontiers of Nanoscience, Snowbird, UT, **2011**
13. BECUR Conference, Tucson, AZ, **2011** (*Student Invited Keynote Speaker*)
14. Dept. of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA, **2011**

15. Dept. of Chemistry & Biochemistry, University of Arizona, AZ, **2011** (*Homer & Emily Weed Seminar*)
16. Dept. of Chemistry and Biochemistry, Brigham Young University, Provo, UT, **2010**
17. Dept. of Chemistry and Biochemistry, University of Arizona, Tucson, AZ, **2010**
18. 5<sup>th</sup> Annual Protein Kinases in Drug Discovery-GTC BIO, Boston, MA **2010**
19. ArQule, Boston, MA **2010**
20. Dept. of Chemistry, University of Kansas, Lawrence, KA, **2010**
21. Sanofi-Aventis, Tucson, AZ **2009**
22. Dept. of Chemistry, Trinity University, San Antonio, TX, **2009**
23. Dept. of Chemistry, University of Illinois, Urbana-Champaign, IL, **2008**
24. Protein Engineering Summit, Boston, MA, **2008**
25. Gordon Research Conference, Bioorganic Chemistry, Andover, NH, **2007**
26. Dept. of Biochemistry, University of Arizona, Tucson, AZ, **2007**
27. Dept. of Chemistry and Biochemistry, Emory, Atlanta, GA, **2007** (*Student Invited seminar*)
28. Dept. of Chemistry, University of Wisconsin, Madison, WI, **2006**
29. Dept. of Chemistry, Michigan State University, East Lansing, MI, **2006**
30. Dept. of Chemistry & Biochemistry, Wayne State University, Detroit, MI, **2006**
31. Sanken International Symposium on Nanoscience and Nanotechnology, Osaka, Japan, **2006**
32. ISIR, Osaka University, Osaka, Japan, **2006**
33. Dept. of Chemistry, Ohio State University, Columbus, OH, **2006**
34. Dept. of Chemistry, Penn. State University, University Park, PA, **2006**
35. Dept. of Chemistry, Purdue University, West Lafayette, IN, **2006**
36. Dept. of Chemistry, Yale University, New Haven, CT, **2006**
37. Gordon Research Conference, Peptides, Chemistry & Biology, Ventura, CA, **2006**
38. Dept. of Chemistry & Biochemistry, University of North Carolina, Chapel Hill, NC, **2006**
39. Dept. of Chemistry, Duke University, Durham, NC, **2006**
40. Dept. of Chemistry & Biochemistry, University of Delaware, Newark, DE, **2005**
41. ACS National Meeting, Division of Organic Chemistry, Molecular Recognition and Self-Assembly, Washington D.C., **2005** (*Contributed talk*)
42. ACS National Meeting, Division of Organic Chemistry, Proteins, Peptides, Amino Acids, and Enzyme Inhibitors, Washington D.C. **2005** (*Contributed talk*)

## SERVICE ACTIVITIES (2005–PRESENT)

### OUTREACH

- |              |  |
|--------------|--|
| 2006         | Guest Lecturer: Undergraduate Professional Development for UBRP Research Program   |
| 2008         | Guest Lecturer, Undergraduate Chemistry Club, SAACS  |
| 2009         | Guest Lecturer: Undergraduate Honors College Paladin Program   |
| 2009         | Seminar Organizer for NSF ADVANCE Program; Invitee Dr. Jennifer Kohler, UTSW   |
| 2009         | Undergraduate Beckman Symposium, Irvine, CA  |
| 2004-Present | Flinn Scholar Finalists: Laboratory Tours  |
| 2006-2011    | High-school student weekend for Biochemistry (now Chemistry & Biochemistry)  |
| 2005-Present | K11-12 High School Student Internships, Student Trainees:<br>Carmen Huerta (2005-2006)<br>Ahmed Badran (2006-2007)<br>Stephen Fan (2007-2008)<br>Veronica Ochea (2010)                             |
| 2005-Present | NSF-REU Participant, Student Trainees:<br>Lyly Tran (2005 summer)<br>Philippe Gonzalez (2006 summer)<br>Vinita Gidwani (2007 summer)<br>Sarah Getter (2010 summer)<br>William Miller (2011 summer) |

## CITIZENSHIP

**a. Intramural (Departmental, College, & University: 2005-Present)**

- 2005 - 2006
- i) Graduate Program Committee
  - ii) Graduate Recruiting Committee, *ad hoc* Foreign Students sub-committee
  - iii) Graduate Recruiting Committee, Biological Chemistry Program
  - iv) Program Committee, Regional ACS Meeting, Tucson, Arizona.
  - v) Biological Chemistry Program Liaison
  - vi) Faculty Advisor to Alpha Chi Sigma (AXE) Student Organization
  - vii) College of Science Student Awards/Scholarship Committee
- 2006 - 2007
- i) Head, Organic Chemistry Division
  - ii) Graduate Recruiting Committee, *ad hoc* Foreign Students sub-committee
  - iii) Graduate Recruiting Committee, Biological Chemistry Program
  - iv) Biological Chemistry Program Liaison
  - v) Faculty Advisor to Alpha Chi Sigma (AXE) Student Organization
  - vi) College of Science Student Awards/Scholarship Committee
- 2007 - 2008
- i) Head, Organic Chemistry Division
  - ii) Co-chair Recruiting/Admission w/Dom McGrath
  - iii) Graduate Program Committee
  - iv) Graduate Recruiting Committee, *ad hoc* Foreign Students sub-committee
  - v) College of Science Student Awards/Scholarship Committee
- 2008 – 2009
- i) Head, Organic Chemistry Division
  - ii) Co-chair Recruiting/Admission w/Dom McGrath
  - iii) Department Head Review Committee, elected by the Faculty/appointed by the Dean
  - iv) Graduate Program Committee
  - v) Graduate Admissions Committee, *ad hoc* Foreign Student files
  - vi) Steering Committee, Biological Chemistry Program
  - vii) College of Science Student Awards/Scholarship Committee
  - viii) College of Science Representative, Honors College Curriculum Committee
  - ix) College of Science, Departmental Peer Review Audit Committee, appointed by the Dean
- 2009 – 2010
- i) Chair, Graduate Program Committee for Chemistry and Biochemistry (>200 students)
  - ii) Steering Committee, Biological Chemistry Program
  - iii) Promotion & Tenure Committee for Dr. Bogdan Olenyuk and Dr. Jeff Pyun and
  - iv) College of Science Student Awards/Scholarship Committee
  - v) College of Science, Honors College Curriculum Committee
  - vi) College of Science, Departmental Peer Review Audit Committee, appointed by the Dean
  - vii) Academic Program Review Committee for Physiology-GIDP, appointed by the Provost
- 2010 – 2011
- i) Chair, Graduate Program Committee for Chemistry and Biochemistry (>200 students)
  - ii) Academic Program Review- Self Study Committee
  - iii) Steering Committee, Biological Chemistry Program
  - iv) Faculty Search Committee – Hired Dr. John Jewett
  - v) University Undergraduate Council, College of Science Representative, appointed by the Dean
  - vi) Academic Program Review Committee for Neuroscience-GIDP, appointed by the Provost
- 2011 – 2012
- i) Graduate Program Committee for Chemistry and Biochemistry
  - ii) Executive Committee, Department of Chemistry & Biochemistry
  - iii) Steering Committee, Biological Chemistry Program

- iv) Undergraduate Program Committee for Chemistry and Biochemistry
  - v) Chair, Faculty Advisory Committee for John Jewett
  - vi) College of Science Student Awards/Scholarship Committee
  - vii) University Undergraduate Council, College of Science Representative, appointed by the Dean
  - viii) Academic Program Review Committee for Pharmacology & Toxicology, appointed by the Provost
- 2012 – 2013
- i) Executive Committee, Department of Chemistry & Biochemistry
  - ii) Steering Committee, Biological Chemistry Program
  - iii) Undergraduate Program Committee for Chemistry and Biochemistry
  - iv) Chair, Faculty Advisory Committee for John Jewett
  - v) Member, Faculty Advisory Committee for Pascal Charest
  - vi) Chair, 3rs Year Review Committee for Elisa Tomat
  - vii) College of Science Student Awards/Scholarship Committee
  - viii) University Undergraduate Council, College of Science Representative, appointed by the Dean
- 2013 – 2014
- i) Executive Committee, Department of Chemistry & Biochemistry
  - ii) Steering Committee, Biological Chemistry Program
  - iii) Undergraduate Program Committee for Chemistry and Biochemistry
  - iv) Chair, Faculty Advisory Committee for John Jewett
  - v) Member, Faculty Advisory Committee for Pascal Charest
  - vi) Chair, P&T Committee for Minying Cai
  - vii) College of Science Student Awards/Scholarship Committee
  - viii) Member, P&T Committee for Jeff Pyun
  - ix) University P&T Committee, College of Science Representative, appointed by the Provost
  - x) University Senate, Member,
- 2014– present
- i) Graduate Program Committee for Chemistry and Biochemistry
  - ii) Steering Committee, Biological Chemistry Program
  - iii) Undergraduate Program Committee for Chemistry and Biochemistry
  - iv) Chair, Faculty Advisory Committee for John Jewett
  - v) Member, Faculty Advisory Committee for Pascal Charest
  - vi) Chair, P&T Committee for Megan McEvoy
  - vii) College of Science Student Awards/Scholarship Committee
  - viii) Member, Faculty Advisory Committee for Jacob Schwartz
  - ix) Member, Faculty Advisory Committee for Elisa Tomat
  - x) University Corporate Relations Committee
  - xi) University Senate, Member

## **b. Extramural (2005-Present)**

### ***i. Professional Activities***

#### **National Service**

- 2005
  - i) Editorial Board, *Chemical Biology & Drug Design (2005-Present)*
  - ii) NIH study section BCMB-L panel
  - iii) Session Chair, ACS National Meeting, Washington, DC
- 2006
  - i) Program Committee, Regional ACS Meeting, Tucson, Arizona
- 2007
  - i) NIH study section BCMB-L panel
  - ii) NIH study section SBCB panel

- 2008
- i) NIH study section BCMB-L panel
  - ii) NIH study section SBCA panel
  - iii) NIH Director's New Innovator Award Study Section
  - iv) NSF Career Panel
  - v) *Ad hoc* Reviewer for NSF
- 2009-2010
- i) External letter writer (P&T)
  - ii) *Ad hoc* Reviewer for NSF
  - iii) *Ad hoc* NIH SBCB panel
  - iv) NIH GO Grant Reviews
  - v) NIH/NCI SBIR Contract Review Panel
  - vi) NIH ZRG1 BST-D (50) Reviews
  - vii) NIH TCNP Project Reviews
  - viii) NIH NDT Reviews
- 2010-2011
- i) External letter writer (P&T)
  - ii) *Ad hoc* Reviewer for NSF
  - iii) NIH SBCB Panel Member 3 meetings/year
  - iv) NIH Review Panel Member for NIH Directors Pioneer Award
  - v) NIH Review Panel Member for COBRE Awards
- 2011-2012
- i) External letter writer (P&T)
  - ii) *Ad hoc* Reviewer for NSF
  - iii) NIH SBCB Panel Member
  - iv) NIH Panel Member for NIH Directors Pioneer Award
  - v) NIH Review Panel Member for BCMB-U
- 2012-2013
- i) External letter writer (P&T)
  - ii) *Ad hoc* Reviewer for NSF
  - iii) NIH SBCB Panel Member
  - iv) NIH Directors Pioneer Award
  - v) Beckman Science Foundation Advisory Panel Member
- 2014-Present
- i) External letter writer (P&T)
  - ii) External Thesis Reader/Committee Member / Scripps
  - iii) External Thesis Reader/Committee Member / Yale
  - iv) *Ad hoc* Reviewer for NSF
  - v) NIH SBCB Panel Member
  - vi) NSF Biomolecular Interactions Panel
  - vii) NIH Transformative Research Award program

### **International Service**

- 2006-2014
- i) Member External Review/Advisory Board for the Institute of Scientific and Industrial Research, Osaka University, Japan 2006-2008
  - ii) External Thesis Reader, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore 2009
  - iii) External Thesis Reader, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore 2010
  - iv) External Thesis Reader, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore 2011

- v) External Thesis Reader, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore 2012
- vi) External Thesis Reader, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore 2014
- vii) External letter writer (P&T for Univ. of Taiwan)
- viii) Reviewer for Israeli National Science Foundation
- ix) Reviewer for Human Frontier Science Program
- x) Reviewer for Marsden Fund, Royal Society of New Zealand
- xi) External Thesis Reader, Eindhoven Technical Univ., Eindhoven, Netherlands

**ii. Ad Hoc Manuscript Reviewer (~ 40 /year)** Chemical Reviews, Journal of the American Chemical Society, Nature Chemical Biology, Nature Methods, Nature Protocols, ACS Chemical Biology, Chemistry & Biology, Chemical Communications, Journal of Organic Chemistry, Organic Letters, Biochemistry, Protein Science, Journal of Medicinal Chemistry, Analytical Chemistry, Bioorganic Medicinal Chemistry Letters, Journal of Peptide Research, Chemical Biology & Drug Design, Tetrahedron Letters, Biomacromolecules, Bioconjugate Chemistry, Small etc.

## GRANTS AND CONTRACTS

### Federal Grants Current

- National Institute of Health R01GM115595 2015-2019  
*"Orthogonally Gated Kinases and Phosphatases"*  
 Total cost \$1,206,674 (PI Ghosh)
  
- National Science Foundation 1506091 2015-2018  
*"A Toolbox for Gating Enzyme Activity using Chemistry and Protein Design,"*  
 Total cost \$480,000 (PI Ghosh)
  
- Through Luceome Biotechnologies (a UA Spinoff) as Chief Scientific Officer*
- National Institute of Health R44GM109740 2016-2018  
*"KINOME-WIDE CELL-BASED ASSAYS"*  
 Total cost \$1,500,000 K (PI Zutshi, co-PI Ghosh)
  
- National Institute of Health R43GM096538 2014-2016  
*"Rapid Histone Methyltransferase Profiling with Luminescent Reporters"*  
 Total cost \$274,561K (PI Zutshi, co-PI Ghosh)
  
- National Institute of Health R43GM110911 2014- 2016  
*"Enabling Malarial Kinome Directed Drug Discovery"*  
 Total cost \$224,251K (PI Zutshi, co-PI Ghosh)
  
- National Institute of Health R43GM109740 2014- 2016  
*"Kinome wide Cell based Assays"*  
 Total cost \$239,923 (PI Zutshi, co-PI Ghosh)

**Complete**

- National Institute of Health R44GM087807-02 2011-2014  
*"Rapid Kinase Profiling with Luminescent Reporters"*  
 Total cost \$1,705,661 (PI Zutshi, co-PI Ghosh)
- National Institute of Health R43GM096538 2010-2013  
*"A Poly(ADP-Ribose) Detection Assay Enabling Drug Discovery and Development"*  
 Total cost \$287,417 (PI Zutshi, co-PI Ghosh)
- National Institute of Health R43GM087807-02 2009-2011  
*"Rapid Kinase Profiling with Luminescent Reporters"*  
 Total cost \$180,886 (PI Zutshi, co-PI Ghosh)
- National Institute of Health R21CA141974 2009-2013  
*"Kinase Selective Small Molecule Conjugates as Antibody Surrogates"*  
 Total cost \$357,129 (PI Ghosh)
- National Institute of Health R21CA143661 2010-2013  
*"Promoter Specific Hypermethylation Sensors for Early Cancer Detection"*  
 Total cost \$337,117 (PI Ghosh)
- National Institute of Health R01GM077403 2006-2011  
*"SEER- A Novel Method for the Detection of Genetic Sequences"*  
 Total cost \$1,374,230 (Co-PI Ghosh: 50% of Total Cost (\$687,115), PI Segal)
- National Institute of Health R01AI068414 2006-2011  
*"Structured Protein Scaffolds for Phage-Display"*  
 Total cost \$1,180,696 (sole PI 100%, Collaborator: N. Ahmed)
- National Science Foundation CAREER Award 2006-2011  
*"CAREER: Self-Assembling Dendrimers: Functional Architectures that Bridge Chemistry and Biology"*  
 Total cost \$550,000 (sole PI 100%)
- National Institute of Health R21 Ranked 1<sup>st</sup> 2006-2009  
*"Direct Detection of Hypermethylation in Cancer"*  
 Total cost \$419,648 (PI Ghosh 54 % (\$225,073), Co-PI Segal)
- National Institute of Health R21AG025954 2005 - 2009  
*"Targeting Amyloid Intermediates by Design and Selection"*  
 Total cost \$325,406 (sole PI 100%)

**State**

- Arizona Biomedical Research Commission 08/2003-07/2006  
 Total cost \$148,500 (sole PI 100%)
- Bio5 SEED Grant 2004-2005  
 Total cost \$50,000 (PI Ghosh 94% Co-PI Lynch, Hruby)
- University of Arizona Faculty Small Grants Program 2003-2004  
 Total cost \$10,000 (sole PI 100%)
- American Cancer Society (IRG), Univ. of Arizona 2002-2003  
 Total cost \$15,000 (sole PI 100%)

**Private Foundations**

- Elsa U. Pardee Foundation 2004-2005  
Total cost \$100,000 (*sole PI 100%*)
- Research Corporation: Research Innovation Award 2002-2005  
Total cost \$35,000 (*sole PI 100%*)
- Petroleum Research Fund (G New Investigator Award) 2002-2005  
Total cost \$35,000 (*sole PI 100%*)
- Leukemia and Lymphoma Society of America 2001-2002  
Total cost \$31,000 (*sole PI 100%*)

**Fellowships & Awards to Students**

- Galileo Fellowship to Graduate Student Mahsa Ghaffari and Javier Castillo-Montaya, 2015
- Galileo Scholarship to Undergraduate Students, Carl Buccholz and Dylan Huttchison
- BCP Fellowship (Training Grant) to Graduate Student Javier Castillo-Montaya 2014-2016
- College of Science, Outstanding Research Award to Undergraduate Carl Buchholz, 2015
- Beckman Scholarship to Undergraduate Carl Buchholz, 2014
- NSF Fellowship to Undergraduate Student Blake Tye, 2013, to attend Harvard
- NSF Fellowship to Undergraduate Student Kurt Cox, 2013, now attending MIT
- Outstanding Junior to Undergraduate Kevin Carlson, 2013
- Galileo Scholarship to Undergraduate Kevin Carlson, 2013
- Beckman Scholarship to Undergraduate Kevin Carlson, 2013-2014
- Outstanding Junior to Undergraduate Andrew Ma, 2012
- BECUR Conference Poster Award to Undergraduate Andrew Ma, 2012
- Beckman Scholarship to Undergraduate Blake Tye, 2012-2013
- UBRP Fellowship to Undergraduate Kevin Carlson, 2012- present
- 1<sup>st</sup> Place Prize, Cusanovich Symposium Poster Fair, Karla Camacho-Soto, 2012
- Pillars of Excellence Award to Undergraduate Andrew Ma, 2012
- Beckman Scholarship to Undergraduate Andrew Ma, 2011-2012
- Nugent Medal and Outstanding Senior Award to Undergraduate Sarah Edwards, 2011
- Galileo Scholarship to Undergraduate Andrew Ma, 2011
- 1<sup>st</sup> Place Prize, Undergraduate Poster Fair, Kurt Cox, 2011
- 2<sup>nd</sup> Place Prize, Undergraduate Poster Fair, Andrew Ma, 2011
- BECUR Conference Best Poster Award to Undergraduate Kurt Cox, 2011
- NSF Fellowship to Undergraduate Student Ahmed Badran 2010, now attending Harvard
- American Chemical Society SURF Fellowship to Undergraduate Kurt Cox, 2010
- Galileo Scholarship to Ben Jester, 2010
- Marvel Award Runner-up to Ben Jester 2010 (*Highest Research Award in Chemistry*)
- Galileo Scholarship to Undergraduate Kurt Cox, 2010
- 1<sup>st</sup> Place Prize, Undergraduate Poster Fair, Ahmed Badran, 2010
- UBRP Fellowship to Undergraduate Andrew Ma, 2010
- ASBMB UAN Travel Award for Outstanding Poster Presentation to Mark Helmers, 2010
- MARC Program, Michelle Redhair, 2010
- Beckman Scholarship to Undergraduate Mark Helmers, 2009-2010
- UBRP Fellowship to Undergraduate Kurt Cox, 2009-
- NASA Undergraduate Fellowship to Akshay Sriprasad, 2009

- Beckman Scholarship to Undergraduate Ahmed Badran 2008-2009
- NIH Ruth Kirschstein predoctoral Fellowship (Training Grant) to Carolyn Shomin 2009
- Imaging Fellowship (Training Grant) to Jenny Furman 2009
- Galileo Scholarship to Jenny Furman, 2009
- Galileo Scholarship to Undergraduate Ahmed Badran, 2009
- Galileo Scholarship to Undergraduate Yomi Ajulo, 2009
- NIH Ruth Kirschstein predoctoral Fellowship (Training Grant) to Ben Jester 2008
- PEO Scholarship to Jenny Furman 2008
- Marvel Award to Cliff Stains 2007 (*Highest Research Award in Chemistry*)
- COS Outstanding Undergraduate Research Award to Thom Gaj 2007
- Bio5 Innovator Award, 2007 Srivats Rajagopal
- ARCS Scholarship to Jason Porter 2007
- Galileo Scholarship to Cliff Stains, 2007
- Galileo Scholarship to Undergraduate Eri Nakatani, 2007
- NIH Ruth Kirschstein predoctoral Fellowship (Training Grant) to Jenny Furman 2007
- NIH Ruth Kirschstein predoctoral Fellowship (Training Grant) to Ben Jester 2007
- UBRP Fellowship to Undergraduate Student, Ahmad Badran, 2007-2010
- Bio<sub>5</sub> Research Fellowship to Min Zhou 2005-2006 (*3 awarded in the University*)
- Marvel Award to Min Zhou 2005 (*Highest Research Award in Chemistry*)
- Bio<sub>5</sub> Award to Jason Porter 2006
- ARCS Scholarship to Jason Porter 2006
- NIH Ruth Kirschstein predoctoral Fellowship (Training Grant) to Jenny Furman 2006
- NIH Ruth Kirschstein predoctoral Fellowship (Training Grant) to Jason Porter 2006
- Southern Arizona Science and Engineering Fair, 1<sup>st</sup> Prize, Ahmed Badran, High School Student, 2006
- Intel International Science Fair Finalist, 2006, Ahmed Badran, High School Student, 2006
- Alumni Award for Excellence in Undergraduate Research, Eri Nakatani, 2006
- UBRP Fellowship to Undergraduate Student, Thom Gaj 2006
- Honors Undergraduate Research Grant to Thom Gaj 2005
- Galileo Scholarship to Min Zhou 2004
- NIH Ruth Kirschstein predoctoral Fellowship (Training Grant) to Cliff Stains 2004-2006
- NSF Fellowship to Undergraduate Student Luisa Gronenberg 2004, PhD Harvard 2010
- College of Science Outstanding Senior Award, Luisa Gronenberg 2004

### **Educational Grants** (*not included in total award to PI*)

- Participant NSF-REU (PI Miranda and McGrath)
- Participant NIH-Chemical Biology Training Grant (PI Montfort)
- NSF “Explorations in Integrated Science: An Interdisciplinary Laboratory Course” 2008-2011 (PI Gail Burd, Co-PI Ghosh w/ three others)  
Publication in *Journal of College Science Teaching* 2014

**STUDENTS SUPERVISED****(POSITIONS IMMEDIATELY AFTER/CURRENT\*)****Graduate Students**

Min Zhou	2001-2006 (PhD)	Sr. Res. Scientist, Promega; PD w/ C. Craik, UCSF
Srivats Rajagopal	2002-2007 (PhD)	Sr. Res. Investigator, Syngene; PD w/ I. Chaiken, Drexel
Scott C. Meyer	2003-2007 (PhD)	Asst. Professor, Benedictine University, Chicago
Cliff I. Stains	2003-2008 (PhD)	Asst. Professor, Univ. Nebraska, PD B. Imperiali, MIT
Jason R. Porter	2004-2009 (PhD)	Postdoctoral Fellow w/ James Wells, UCSF
Jenny L. Furman	2005-2010 (PhD)	Scientist, Johnson & Johnson; PD w/ PG Schultz, Scripps
Sujan Shekhawat	2005-2011 (PhD)	Postdoctoral Fellow w/ Eric Strieter, Univ. Wisconsin
Carolyn D. Shomin	2006-2011 (PhD)	Assoc. Scientist, Agensys, CA
Benjamin W. Jester	2006-2011 (PhD)	Postdoctoral Fellow w/ Stanley Fields, Univ. of Washington
Vandana Lamba	2006-2012 (PhD)	Postdoctoral Fellow w/ Dan Herchlag, Stanford University
Shengyi Shen	2006-2013 (PhD)	Research Assistant, College of Medicine, Tucson, AZ
Perrin Mok	2008-2014 (PhD)	Postdoctoral Scientist, Luceome Biotechnologies, Tucson, AZ
Elizabeth Restituyo	2008-2015 (PhD)	Scientist, Protein Technologies, Tucson, AZ
Karla Camacho-Soto	2009-2015 (PhD)	Scientist, Luceome Biotechnologies, Tucson, AZ
Sean Campbell	2009-2015 (PhD)	Clinical Chemistry Fellow, University of Virginia
Luca Ogunleye	2009-2015 (PhD)	Scientist, Wolfe Laboratories, Watertown, MA
Mahsa M. Ghaffari	2011-	
Javier Castillo-Montaya	2011-	
Chandi S. De Silva	2012-	
Matthew Bienick	2014-	

**Undergraduate Research Students (w/research publications\*)**

T. J. Smith*	B.S., 2003 Honors Thesis	MD Program, Univ. of Arizona
Luisa Gronenberg*	B.S., 2004 Honors Thesis	PhD Program, Harvard University
Aaron Goldman*	B.S., 2005 Honors Thesis	PhD Program in Cancer Biol., Univ. of Arizona
Thomas Gaj*	B.S., 2007 Honors Thesis	PhD Program, Scripps Research Institute
Jack Hannallah*	B.S., 2007 Honors Thesis	MBA and MD Program, University of Arizona
Eri Nakatani*	B.S., 2008 Honors Thesis	PhD Program, Univ. of WA, Seattle
Yomi Ajulo*	B.S., 2009 Honors Thesis	MS Program in Chemical Engineering, ASU
Akshay Sriprasad*	B.S., 2010	PhD Program in Engineering, UT Austin
Ahmed Badran*	B.S., 2010 Honors Thesis	PhD Program, Harvard University
Kurt Cox*	B.S., 2011 Honors Thesis	PhD Program, MIT
Mark Helmers*	B.S., 2011	MD-PhD Program, Johns Hopkins
Sarah Edwards	B.S., 2011	PhD Program, Stanford
Alicia Gaj*	B.S., 2012	PhD Program, Oxford
Blake Tye*	B.S., 2013 Honors Thesis	PhD Program, Harvard University
Andrew Ma*	B.S., 2013 Honors Thesis	MD Program, New York University
Kevin Carlson*	B.S., 2014 Honors Thesis	MD Program, University of Virginia
Carl Buchholz*	B.S., 2015 Honors Thesis	MD Program, University of Virginia

**TEACHING**

Formal class room courses taught since 2001: CHEM 241A/B (non-majors Organic Chemistry); CHEM 242A/B (Honors Organic Chemistry); CHEM 543 (Structural Organic Chemistry); CHEM 546 (Bioorganic Chemistry & Chemical Biology)

Teaching Evaluations for Courses Taught Recently

1.0(poor) - 5.0 (excellent)

Departmental Average for lower division Chem classes: **3.9**

Instructor (Ghosh) Average for lower division Chem classes (2011-2016): **4.6**

<b>Semester</b>	<b>Course (Contact Hours)</b>	<b>Teaching Evaluation</b>	<b>Enrollment</b>
2011-SPRING	CHEM 242B (3+2)	4.8/5.0	71
2011-FALL	CHEM 242A (3+2)	4.4/5.0	91
2011-FALL	HNRS 195I(1)	4.6/5.0	20
2012-SPRING	CHEM 242B (3+2)	4.6/5.0	84
2012-FALL	CHEM 242A (3+2)	4.5/5.0	97
2012-FALL	HNRS 195I (1)	4.9/5.0	19
2013-SPRING	CHEM 242B (3+2)	4.6/5.0	78
2013-FALL	CHEM 242A (3+2)	4.3/5.0	84
2013-FALL	HNRS 195I (1)	4.4/5.0	15
2014-SPRING	CHEM 242B (3+2)	4.8/5.0	73
2014-FALL	HNRS 195I (1)	4.7/5.0	15
2015-SPRING	CHEM 241B (3+2)	4.6/5.0	223
2015-SPRING	CHEM 241B (3+2)	4.6/5.0	181
2015-FALL	HNRS 195I (1)	3.8/5.0	18
2016-SPRING	CHEM 241B (3)	4.7/5.0	252
2016-SPRING	CHEM 241B (3)	4.6/5.0	249