

**Amy E. Palmer**  
**Curriculum Vitae**

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Department of Biochemistry  
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## EMPLOYMENT

**Professor** 2018 - present  
**Associate Professor** 2012 - 2018  
**Assistant Professor** 2005 - 2012

Department of Chemistry and Biochemistry  
University of Colorado, Boulder  
Member, BioFrontiers Institute  
Member, Program in Neuroscience  
Member, Medical Scientist Training Program

**Visiting scientist, Unité des Interaction Bactéries Cellules, Pasteur Institute Jan 2013 – July 2013**

## EDUCATION

**Ph.D., Chemistry** December 2001  
Stanford University  
*Advisor:* Edward I. Solomon  
*Thesis title:* Spectroscopic Studies of Multicopper Oxidases: Probing the Nature and Reactivity of the Different Copper Sites

**M.A., Education** June 2000  
Stanford University  
Emphasis: Curriculum Development and Teacher Education in Science

**B.A., Biophysical Chemistry, cum laude** June 1994  
Dartmouth College  
*Advisor:* Karen E. Wetterhahn  
*Thesis title:* The Effect of Ascorbate and Glutathione on the Interaction of Chromium(VI) with DNA

## RESEARCH EXPERIENCE

**Postdoctoral Research Fellow** March 2005 – June 2005  
University of California San Diego  
*Advisor:* Roger Y. Tsien

**NIH Postdoctoral Fellow** March 2003 – March 2005  
University of California San Diego  
*Advisor:* Roger Y. Tsien

**Postdoctoral Research Associate** November 2001 – March 2003  
University of California San Diego  
*Advisor:* Roger Y. Tsien

**Graduate Research Assistant** September 1995 – September 2001  
Stanford University  
Department of Chemistry  
*Advisor:* Edward I. Solomon

**Professional Research Assistant** June 1994 – July 1995  
Dartmouth College  
Department of Chemistry

Advisor: Karen E. Wetterhahn

**Undergraduate Research Assistant**

Dartmouth College

Department of Chemistry

Advisor: Karen E. Wetterhahn

**March 2003 – June 2004**

**HONORS AND AWARDS**

- 2021 Beckman Center for Light Sheet Microscopy and Data Science Award
- 2019 Janelia Research Campus, Advanced Imaging Center, Visiting Scientist – 2 weeks
- 2019 College Scholar Award, CU Boulder College of Arts and Sciences
- 2017 Marinus Smith Award, CU Boulder
- 2016 Chancellor's Award for Excellence in STEM Education, CU Boulder
- 2016 ASSETT Faculty Development Award, CU Boulder
- 2015 Chair Elect: Cell Biology of Metals Gordon Research Conference
- 2014 NIH Director's Pioneer Award
- 2013 Program Project Grant Awardee – Human Frontiers Science Project
- 2013 Vice Chair Elect: Cell Biology of Metals Gordon Research Conference
- 2011 Featured in the National Institute of General Medical Sciences magazine "Findings" (Jan 2011 issue)
- 2010 NSF CAREER award
- 2010 Ed Stiefel Young Investigator Award in Biological Inorganic Chemistry
- 2010 Alfred P. Sloan Research Fellow
- 2007 Whitehall Foundation Award
- 2004 Pfizer Postdoctoral Poster Award, Gordon Research Conference in Bioorganic Chemistry
- 2004 Best poster invitational lecture, FASEB Conference on Calcium and Cell Function
- 2003 Ruth L. Kirschstein National Research Service Award, NIH Postdoctoral Fellowship
- 2000 Franklin Veatch Memorial Fellowship, Department of Chemistry, Stanford University
- 1998 Centennial Teaching Award, Department of Chemistry, Stanford University

**LEADERSHIP**

- 2023 – present Director, Arts and Sciences Honors Program, CU Boulder
- 2021 – 2023 Chair, Cellular and Molecular Technologies Study Section, NIH
- 2018 – 2023 Associate Chair of Undergraduate Affairs, Department of Biochemistry, CU Boulder

**PUBLICATIONS (The final author is the corresponding author)**

***Publications***

- 105. Holtzen, S.E., Navid, E., Kainov, J., **Palmer, A.E.** Transient Zn<sup>2+</sup> deficiency induces replication stress and compromises daughter cell proliferation, bioRxiv 2023; doi: <https://doi.org/10.1101/2023.12.08.570860>; Submitted
- 104. Damon, L.J., Ocampo, D., Sanford, L., Jones, T., Allen, M.A., Dowell, R.D., **Palmer, A.E.** Cellular zinc status alters chromatin accessibility and binding of transcription factor TP53 to genomic sites, bioRxiv 2023.11.20.567954; doi: <https://doi.org/10.1101/2023.11.20.567954>; Submitted
- 103. Rakshit, A., Holtzen S.E., Lo, M.N., Conway, K.A., **Palmer, A.E.**, Human cells experience a Zn<sup>2+</sup> pulse in early G1, *Cell Reports*, 2023, 42(6): 112656, doi: 10.1016/j.celrep.2023.112656
- 102. **Palmer, A.E.** and Lavis, L. "Chapter 17: Cellular Imaging" in Hang, Pratt, Prescher (Eds.): *Advanced Chemical Biology. Chemical Dissection and Reprogramming of Biological Systems/ISBN: 978-3-527-34733-9* (book chapter)
- 101. Lennon, S., Wierzba, A., Swik, S. Gryko, D., **Palmer, A.E.\***, Batey, R.\*, Targeting riboswitches with beta-axial substituted cobalamins, *ACS Chem Bio*, 2023, 18(5): 1136-1147, doi: 10.1021/acscchembio.2c00939. (\* co-corresponding)
- 100. Torres Ocampo, A.P. and **Palmer, A.E.**, Genetically encoded fluorescent sensors for metals in biology, *Curr. Opin. Chem. Bio.*, 2023, 74:102284

99. Damon, L.J., Aaron, J. **Palmer, A.E.**, Single molecule microscopy to profile the effect of zinc status of transcription factor dynamics, *Sci Rep.*, 2022, 12(1):17789 (bioRxiv: <https://doi.org/10.1101/2022.05.10.491421>)
98. Mukherjee, S., Manna, P., Hung, S-T., Vietmeyer, F., Friis, P., **Palmer, A.E.**, Jimenez, R., Directed evolution of a bright variant of mCherry: Suppression of non-radiative decay by fluorescence lifetime selections, *J. Phys Chem B.* 2022, 126(25):4659-4668
97. Prasad, R.R., Raina, K., Mishra, N., Tomar, M., Kumar, R.E., **Palmer, A.E.**, Agarwal, R., Stage-specific differential expression of zinc transporter SLC30A and SLC39A family proteins during prostate tumorigenesis, *Molecular carcinogenesis*, 2022, 61(5):454-471
96. Janiszewski, L.N., Minson, M., Allen, M.A., Dowell, R.D., **Palmer, A.E.**, Characterization of global gene expression, regulation of metal ions, and infection outcomes in immune competent 129S6 mouse macrophages, *Infect. Immun.*, 2021, Aug 2:IAI0027321. doi: 10.1128/IAI.00273-21. (bioRxiv <https://doi.org/10.1101/2021.03.18.436026>)
95. Anson, K.J., Corbett, G.A., **Palmer, A.E.**, Zn<sup>2+</sup> influx activates ERK and Akt signaling pathways through a common mechanism, *Proc. Nat. Acad. Sci.*, 2021, 118(11):e2015786118 (bioRxiv 2020.07.27.223396)
94. Pratt, E.P., Anson, K.J.\*, Tapper, J.K.\*, Simpson, D.M., **Palmer, A.E.**, Systematic comparison of vesicular targeting signals leads to the development of a genetically-encoded vesicular fluorescent Zn<sup>2+</sup> and pH sensor, *ACS Sensors*, Dec 24;5(12):3879-3891. doi: 10.1021/acssensors.0c01231, \*equal contributions
93. Pratt, E.P., Damon, L.J., Anson, K.J., **Palmer, A.E.**, Tools and Technologies for Illuminating the Cell Biology of Zinc, *Biochem. Biophys. Acta*, 2021 Jan;1868(1):118865 (invited review)
92. Mukherjee, S., Hung, S.-T., Douglas, N., Manna, P., Thomas, C., Ekrem, A., **Palmer, A.E.**, Jimenez, R., Structure-guided point mutations on FusionRed produce a brighter red fluorescent protein, *Biochemistry*, 2020, Oct 6;59(39):3669-3682. doi: 10.1021/acs.biochem.0c00484, PMID: 32914619
91. Braselmann, E. and **Palmer, A.E.**, A multicolor riboswitch-based platform for imaging of RNA in live mammalian cells, *Methods in Enzymology*, 2020, 641:343-372. doi: 10.1016/bs.mie.2020.03.004 (invited methods protocol)
90. Braselmann, E., Rathbun, C., Richards, E.M., **Palmer, A.E.**, Illuminating RNA Biology: Tools for Imaging RNA in Live Mammalian Cells, *Cell Chem Biol.* 2020 Jul 6:S2451-9456(20)30233-6. doi: 10.1016/j.chembiol.2020.06.010.
89. Sanford, L., **Palmer, A.E.**, Dissociated hippocampal neurons exhibit distinct Zn<sup>2+</sup> dynamics in a stimulation method-dependent manner, *ACS Chem. Neurosci.*, 2020 Feb 19;11(4):508-514. doi: 10.1021/acchemneuro.0c00006. Epub 2020 Feb 6., PMID: 32013397 (bioRxiv 2020.01.03.894501)
88. Han, Y., Sanford, L., Simpson, D.M., Dowell, R., **Palmer, A.E.**, Remodeling of Zn<sup>2+</sup> Homeostasis Upon Differentiation of Mammary Epithelial Cells, *Metallomics*, 2020, Mar 25;12(3):346-362. doi: 10.1039/c9mt00301k., PMID:31950952
87. Lo, M.N., Damon, L.J., Wei Tay, J., Jia, S., **Palmer A.E.**, Single Cell Analysis Reveals Multiple Requirements for Zinc in the Mammalian Cell Cycle, *eLife*, Feb 4;9. pii: e51107. doi: 10.7554/eLife.51107, (bioRxiv 73514)
86. Braselmann, E., Stasevich, T.J., Lyon, K., Batey, R.B., **Palmer, A.E.**, Detection and quantification of single mRNA dynamics with the Riboglow fluorescent RNA tag, 2019, bioRxiv 701649 preprint
85. Sanford, L., Carpenter, M.C., **Palmer, A.E.**, Intracellular Zn<sup>2+</sup> transients modulate global gene expression in dissociated rat hippocampal neurons, *Sci. Rep.*, 2019, 9(1): 9411, PMID: 31253848
84. Slocum, J., **Palmer, A.E.**, Jimenez, R., Intramolecular Fluorescent Protein Association in a Class of Zinc FRET Sensors Leads to Increased Dynamic Range, *J. Phys. Chem. B*, 2019, 123(14):3079-3085, PMID: 30942588
83. Nolan, E., Gans, S., Llamas, L., Bandyopadhyay, S., Brittain, S.M., Bernasconi-Elias, P., Carter, K.P., Loureiro, J.L., Thomas, J.R., Schirle, M., Yang, Y., Guo, N., Roma, G., Schuierer, S., Beibel, M., Lindeman, A., Sigoillot, F., Chen, A., Xie, X., Ho, S., Reece-Hoyes, J., Weihofen, W., Tyskiewicz, K., Hoepfner, D., McDonald, R.I., Guthrie, N., Dogra, A., Guo, H., Shao, J., Ding, J., Canham, S., Boynton, G., George, E.L.,

- Kang, Z., Antczak, C., Porter, J.A., Wallace, O., Tallarico, J.A., **Palmer, A.E.**, Jenkins, J.L., Jain, R.K., Bushell, S.M., Fryer, C.J., Discovery of a Zip7 Inhibitor from a Notch Pathway Screen, *Nature Chem. Bio.*, 2019, 15(2):179-188, PMID: 30643281
82. Han, Y., Goldberg, J., Lippard, S.J., Palmer, A.E., Superiority of SpiroZin2 Versus FluoZin-3 for monitoring vesicular Zn<sup>2+</sup> allows identification of lysosomal Zn<sup>2+</sup> accumulation in lactating mammary cells, *Sci. Rep.*, 2018, 8(1):15034, PMID: 30094420
81. Manna, P., Hung, S-T; Friis, P., Mukherjee, S., Simpson, D.M., Lo, M., **Palmer, A.E.**, Jimenez, R., Directed Evolution of Excited State Lifetime and Brightness in Red Fluorescent Proteins using a Microfluidic Sorter, *Integrative Biology*, 2018, 10(9):516-526, PMID 30094420
80. Braselmann, E., Wierzba, A.\*, Polaski, J.T.\*, Chromiński, M., Holmes, Z.E., Hung, S.-T., Batan, D., Wheeler, J. R., Parker, R., Jimenez, R., Gryko, D., Batey, R.T., **Palmer, A.E.**, A multi color riboswitch-based platform for live cell imaging of RNA in mammalian cells (\* these authors contributed equally to this work); *Nature Chem. Bio.*, 2018, 14(10):964-971 (bioRxiv 199240), PMID: 30061719
79. Batan, D.\*, Braselmann, E.\*, Nguyen, D.M.T., Minson, M., Cossart, P., **Palmer A.E.**, A multi-color split-fluorescent protein approach to visualize Listeria protein secretion dynamics in infection, *Biophys. J.*, 2018, 115(2): 251-262 (\*these authors contributed equally to this work), PMID: 29653838
78. Choi, S., Hu, Y.A., Corkins, M.E., **Palmer, A.E.**, and Bird, A.J., Zinc transporters belonging to the Cation Diffusion Facilitator (CDF) family have complementary roles in transporting zinc out of the cytosol, *PLoS Genetics*, 2018, 14(3):e1007262. doi: 10.1371, PMID:29529046
77. Sanford, L., **Palmer, A.**, Recent advances in Development of Genetically Encoded Fluorescent Sensors, *Methods Enzymol.*, 2017; 589: 1-49, PMID 28336060
76. Young, A.M. and **Palmer, A.E.**, Methods to Illuminate the Role of Salmonella Effector Proteins during Infection: A Review, *Frontiers in Cellular and Infection Microbiology*, 2017, Aug 10, 7:363, doi: 10.3389/fcimb.2017.00363, PMID: 28848721
75. Carter, K.P.\*, Carpenter, M.C.\*, Fiedler, B.L., Jimenez, R., **Palmer, A.E.**, Critical comparison of FRET-sensor functionality in the Cytosol and Endoplasmic Reticulum and Implications for Quantification of Ions, *Anal. Chem.*, 2017, 89(17):9601-9608, PMID: 28758723 (\*these authors contributed equally to this work)
74. Young, A.M., Minson, M., McQuate, S.E., **Palmer, A.E.**, Optimized Fluorescence Complementation Platform for Visualizing *Salmonella* Effector Proteins Reveals Distinctly Different Intracellular Niches in Different Cell Types, *ACS Infectious Disease*, 2017, 3(8):575-584, PMID: 28551989
73. Lauinger, L; Li, J; Shostak, A; Cemel, IA; Ha, N; Zhang, Y; Merkl, P; Obermeyer, S; Stankovic-Valentin, N; Schafmeier, T; Wever, WJ; Bowers, AA; Carter, KP; **Palmer, A.E.**; Tschochner, H; Melchior, F; Deshaies, RJ; Brunner, M; Diernfellner, A. Thiolutin is a zinc chelator that inhibits the RPN11 and other JAMM metalloproteases. *Nature Chem. Biol.*, 2017, 13(7):709-714, PMID:28459440
72. Carpenter, M.C. and **Palmer, A.E.**, Native and Engineered Sensors for Ca<sup>2+</sup> and Zn<sup>2+</sup>, *Essays in Biochemistry*, 2017, 61(2):237-243, PMID: 28487400 (refereed review)
71. Li, J., Yakushi, T., Parlati, F., Mackinnon, A.L., Perez, C., Ma, Y., Carter, K.P., Colayco, S., Magnuson, G., Brown, B., Nguyen, K., Vasile, S., Suyama, E., Smith, L.H., Sergienko, E., Pinkerton, A.B., Chung, T.D.Y., **Palmer, A.E.**, Pass, I., Hess, S., Cohen, S.M., Deshaies, R.D., Capzimin is a potent and specific inhibitor of proteasome isopeptidase Rpn11, *Nature Chem. Bio.*, 2017, 13(5):486-493, PMID:28244987
70. Mo GC, Ross B, Hertel F, Manna P, Yang X, Greenwald E, Booth C, Plummer AM, Tenner B, Chen Z, Wang Y, Kennedy EJ, Cole PA, Fleming KG, **Palmer A**, Jimenez R, Xiao J, Dedecker P, Zhang J., Genetically-Encoded Biosensors for Visualizing Live-cell Biochemical Activity at Super-resolution, *Nature Methods*, 2017, Apr;14(4):427-434.
69. Fiedler B.L., Van Buskirk S., Carter K.P., Qin Y., Carpenter M.C., **Palmer A.E.**\*, Jimenez R.\*, Droplet Microfluidic Flow Cytometer For Sorting On Transient Cellular Responses of Genetically-Encoded Sensors, *Anal. Chem.*, 2017, Jan 3;89(1):711-719, PMID: 27959493 (\*co-corresponding)

68. Qin, Y., Sammond, D.W., Braselmann, E., Carpenter, M.C., **Palmer, A.E.**, Development of an Optical Zn<sup>2+</sup> Probe Based on a Single Fluorescent Protein, *ACS Chem. Biol.*, 2016, 11(10): 2744-2751, PMID: 27467056
67. Specht, E.A., Braselmann, E., **Palmer, A.E.**, A Critical and Comparative Review of Fluorescent Tools for Live Cell Imaging, *Annu. Rev. Physiology*, 2017, 79:93-117, PMID: 27860833 (refereed review)
66. Carpenter, M.C., Lo, M.L., **Palmer, A.E.**, Techniques for Measuring Cellular Zinc, *Arch. Biochem. Biophys.*, 2016, 611:20-29, PMID: 27580940 (refereed review)
65. Rodriguez, E.A., Campbell, R.E., Lin, J.Y., Lin, M.Z., Miyawaki, A., **Palmer, A.E.**, Shu, X., Zhang, J., Tsien, R.Y., The growing and glowing toolbox of fluorescent and photoactive proteins, *Trends in Biochem. Sci.*, 2017, 42(2):111-129, PMID: 27814948 (refereed review)
64. McQuate, S.E., Young, A.M., Silva-Herzog, E., Bunker, E., Hernandez, M., de Chaumont, F., Liu, X., Detweiler, C.S., **Palmer, A.E.**, Long-Term Live Cell Imaging Reveals New Roles for Salmonella Effector Proteins SseG and SteA, *Cell Microbiology*, 2017, 19(1), PMID: 27376507
64. Carpenter, M.C. and **Palmer, A.E.** Unraveling the mystery of the ring: Tracking heme dynamics in living cells, *Proc. Natl. Acad. Sci.*, 2016, 113(27):7296-7. (commentary piece)
63. Dean, K.M., Davis, L.M., Lubbeck, J.L., Manna, P., Friis, P., **Palmer, A.E.\***, Jimenez, R.\*, High-speed multiparameter photophysical analyses of fluorophore libraries, *Anal. Chem.*, 2015, 87(10):5026-30, (\*co-corresponding)
62. Kim, T.J., Joo, C., Seong, J., Vafabakhsh, R., Botvinick, E.L., Berns, M.W., **Palmer, A.E.**, Wang, N., Ha, T., Jakobsson, E., Sun, J., Wang, Y., Distinct mechanisms regulating mechanical force-induced Ca<sup>2+</sup> signals at the plasma membrane and the ER in human MSCs, *Elife*, 2015, 4:e04876. doi: 10.7554/eLife.04876, PMID: 25667984
61. Carter, K.P., **Palmer AE.**, Metallobiology: Zinc differently, *Nature Chem.* 2015, 7(2):96-7. doi: 10.1038/nchem.2165, PMID: 25615659 (commentary piece)
60. Park, J.G., **Palmer, A.E.**, Properties and use of genetically encoded FRET sensors for cytosolic and organelle Ca<sup>2+</sup> measurements., *Cold Spring Harb Protoc.* 2015 Jan 5;2015(1), PMID: 25561625 (refereed review)
59. Park, J.G., **Palmer, A.E.**, Measuring the in situ K<sub>d</sub> of a genetically encoded Ca<sup>2+</sup> sensor, *Cold Spring Harb Protoc.* 2015 Jan 5;2015(1):pdb.prot076554. doi: 10.1101/pdb.prot076554., PMID: 25561615 (refereed review)
58. Park, J.G., **Palmer, A.E.**, Verifying the function and localization of genetically encoded Ca<sup>2+</sup> sensors and converting FRET ratios to Ca<sup>2+</sup> concentrations, *Cold Spring Harb Protoc.* 2015 Jan 5;2015(1):pdb.prot076547. doi: 10.1101/pdb.prot076547, PMID: 25561614 (refereed review)
57. Dean, K.M., Lubbeck, J.L., Davis, L.M., Regmi, C.K., Chapagain, P.P., Gerstman, B.S., Jimenez, R.\*, **Palmer, A.E.\***, Microfluidics-Based Selection of Red-Fluorescent Proteins with Decreased Rates of Photobleaching, *Integrative Biology*, 2015, 7(2):263-73, PMID: 25477249 (\* co-corresponding)
56. Farnsworth, N.L., Mead, B.E., Antunez, L.R., **Palmer, A.E.**, Bryant, S.J., Ionic osmolytes and intracellular calcium regulate tissue production in chondrocytes cultured in a 3D charged hydrogel, *Matrix Biology*, 2014, pii: S0945-053X(14)00128-0, PMID: 25128592
55. Dean, K.M., **Palmer A.E.**, Advances in fluorescence labeling strategies for dynamic cellular imaging, *Nature Chemical Biology*, 2014, 10(7): 512-23, PMID: 24937069 (refereed review)
54. Carter, K.P., Young, A.M., **Palmer, A.E.**, Fluorescent Sensors for Measuring Metal Ions in Living Systems. *Chem. Rev.*, 2014, 114(8):4564-601, PMID: 24588137 (refereed review)
53. Park J.G., **Palmer A.E.**, Quantitative measurement of Ca<sup>2+</sup> and Zn<sup>2+</sup> in Mammalian Cells using Genetically Encoded Fluorescent Biosensors, *Methods Mol Biol.* 2014;1071:29-47. doi: 10.1007/978-1-62703-622-1\_3.
52. Stavru F., **Palmer A.E.**, Wang C, Youle RJ, Cossart P., Atypical mitochondrial fission upon bacterial infection., *Proc Natl Acad Sci U S A.* 2013, 110(40):16003-8, PMID: 24052378

51. Qin, Y., Miranda, J.G., Stoddard, C.I., Park, J.G., Dean, K.M., **Palmer, A.E.**, Direct Comparison of a Genetically Encoded Sensor and Small Molecule Indicator: Implications for Quantification of Cytosolic Zn<sup>2+</sup>, *ACS Chem. Bio.*, 2013, 8(11): 2366-71, PMID: 23992616
50. Park, J.G. and **Palmer, A.E.**, Properties and use of genetically-encoded FRET sensors for cytosolic/organelle Ca<sup>2+</sup> measurements, *Calcium Techniques Protocols*, Cold Springs Harbor Press, Editors: Jan B. Parys, Martin Bootman, David I. Yule, Gert Bultynck (refereed protocol)
49. **Palmer, A.E.**, Miranda, J.G., Carter, K.P., Fluorescent zinc sensors, *Metals in Cells* Volume of Encyclopedia of Inorganic and Bioinorganic Chemistry, Wiley, Editor: Valeria Culotta and Robert Scott, ISBN: 978-1-119-95323-4 (refereed review)
48. Davis L.M., Lubbeck J.L., Dean K.M., **Palmer A.E.**, Jimenez R., Microfluidic cell sorter for use in developing red fluorescent proteins with improved photostability, *Lab Chip*, 2013, 13(12):2320-7, PMID: 23636097
47. Jeong, J., Walker, J.M., Wang, F., Park, J.G., **Palmer, A.E.**, Giunta, C., Rohrbach, M., Steinmann, B., Eide, D.J., Promotion of vesicular zinc efflux by ZIP13 and its implications for spondylocheiro dysplastic Ehlers-Danlos Syndrome, *Proc. Natl. Acad. Sci.*, 2012, 109(51):E3530-8, PMID: 23213233
46. Geng, X., Huang, C., Qin, Y., McCombs, J.E., Yuan, Q., Harry, B.L., **Palmer, A.E.**, Xia, N.-S., Xue, D., Hepatitis B virus protein targets Bcl-2 proteins to increase intracellular calcium, required for virus replication and cell death induction, *Proc. Natl. Acad. Sci.*, 2012, 109(45):18471-6, PMID: 23213233
45. Miranda, J.G., Weaver, A.L., Qin, Y., Park, J.G., Stoddard, C.I., Lin, M.Z., **Palmer, A.E.**, New alternately colored FRET sensors for simultaneous monitoring of Zn<sup>2+</sup> in multiple cellular locations, *PLoS One*, 2012, 7(11):e49371, PMID: 23173058
44. Park, J.G., Qin, Y., Galati, D.F., **Palmer, A.E.**, New sensors for quantitative measurement of mitochondrial Zn<sup>2+</sup>, *ACS Chem. Bio.*, 2012, 7(10):1636-40, PMID: 22850482
43. Dean, K.M., Qin, Y., **Palmer, A.E.**, Visualizing metal ions in cells: an overview of analytical techniques, approaches, and probes, *Biochim. Biophys. Acta*, 2012, 1823(9):1406-15, PMID: 22521452 (refereed review)
42. West, D.C., Qin, Y., Peterson, Q.P., Thomas, D.L., Palchadhuri, R., Morrison, K.C., Lucas, P.L., **Palmer, A.E.**, Fan, T.M., Hergenrother, P.J., Differential Effects of Pro-caspase-3 Activating Compounds in Cancer Cell Death, *Molecular Pharmaceutics*, 2012, 9(5):1425-34, PMID: 22486564
41. Lubbeck, J.L., Dean, K.M., Ma, H., **Palmer, A.E.\***, Jimenez, R.\*, Microfluidic flow cytometer for quantifying reversible and irreversible photobleaching of fluorescent proteins in cells, *Anal. Chem.*, 2012, 84(9):3929-37, PMID: 22424298, (\*co-corresponding)
40. Ma, H., Gibson, E.A., Dittmer, P.J., Jimenez, R.\*, **Palmer, A.E.\***, High-throughput Examination of Fluorescence Resonance Energy-Detected Metal-ion Responses in Mammalian Cells, *J. Am. Chem. Soc.*, 2012, 134(5):2488-91, PMID: 22260720, (\*co-corresponding)

\*\*recommended as being of special significance by Faculty of 1000\*\*

**Publications prior to submission of tenure package Fall 2011**

39. Dean, K.M., Lubbeck, J.L., Binder, J. Schwall, L.R., Jimenez, R.\*, **Palmer A.E.\***, Analysis of Red-Fluorescent Proteins Provides Insight into Dark-State Conversion and Photodegradation, *Biophysical Journal*, 2011, 101: 961-969, PMID: 21843488 (\*co-corresponding)
38. Qin, Y., Dittmer, P.D., Park, J.G., Jansen, K.B., **Palmer A.E.**, Steady state and dynamic measurements of endoplasmic reticulum and Golgi Zn<sup>2+</sup> using genetically encoded sensors, *Proc. Natl. Acad. Sci. U S A*, 2011, 108(18):7351-6. PMID: 21502528
37. **Palmer, A.E.\***, Qin, Y., Park, J.G., McCombs, J.E., Design and application of genetically encoded biosensors, *Trends in Biotechnology*, 2011, 29(3):144-52. PMID: 21251723 (\* denotes corresponding author, refereed review)
36. Perocchi, F., Gohil, V.M., Girgis, H.S., Bao, X.R., McCombs, J.E., **Palmer, A.E.**, Mootha, V.K., *MICU1* encodes a mitochondrial EF hand protein required for Ca<sup>2+</sup> uptake, *Nature*, 2010, 467(7313):291-6., PMID: 20693986

35. Ravier M.A., Cheng-Xue R., **Palmer A.E.**, Henquin J.C., Gilon P., Subplasmalemmal Ca(2+) measurements in mouse pancreatic beta cells support the existence of an amplifying effect of glucose on insulin secretion, *Diabetologia*, 2010, 53(9):1947-57. PMID: 20461354
34. McCombs, J.E., Gibson, E.A., **Palmer, A.E.**, Using a genetically targeted sensor to investigate the role of presenilin-1 in ER Ca<sup>2+</sup> levels and dynamics, *Molecular Biosystems*, 2010, 6(9):1640-9. PMID: 20379593
33. Ong, D.S., Mu, T.W., **Palmer, A.E.**, Kelly, J.W., Endoplasmic Reticulum Ca<sup>2+</sup> Increases Enhance Glucocerebrosidase Folding, Trafficking and Function, *Nature Chemical Biology*, 2010, 6(6):424-32., PMID: 20453863
32. VanEngelenburg, S.B., and **Palmer, A.E.**, General method for live-cell imaging of Type-III Secretion reveals effector dynamics and spatial segregation of three *Salmonella* effectors, *Nature Methods*, 2010, 7(4): 325-30, PMID: 20228815  
 \* This work was highlighted in *Nature Structural and Molecular Biology*, 17, 397 (2010)
31. VanEngelenburg, S.B., Nahreini, T, and **Palmer, A.E.**, FACS-based selection of tandem tetracysteine peptides with improved ReAsH brightness in live-cells, *ChemBioChem*, 2010, 11(4): 489-493, PMID: 20099291
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29. **Palmer A.E.**, Franz, K.J. Introduction to "Cellular metal homeostasis and trafficking", *Chem. Rev.* 2009, 109 (10): 4533-4535, PMID: 19778037 (commentary piece)
28. **Palmer, A.E.**, Expanding the repertoire of fluorescent calcium indicators, *ACS Chemical Biology*, 2009, 4(3): 157-159, PMID: 19298092 (commentary piece)
27. Dittmer, P.J., Miranda, J.G., Gorski, J.A., **Palmer, A.E.**, Genetically encoded sensors elucidate spatial distribution of zinc, *J. Biol. Chem.*, 2009, 284(24): 16289-97, PMID: 19363034
26. Schafer, D., Gibson, E.A., Salim, E.A., **Palmer, A.E.**, Jimenez, R., and Squier, J., Optically integrated microfluidic cell counter fabricated by femtosecond laser ablation and anodic bonding, *Optics Express*, 2009, 17(8): 6068, PMID: 19365429
25. Astori, S., Wallace, D.J., Borgloh, S.M.z.A., Yang, Y., Bausen, M., Kugler, S., **Palmer, A.E.**, Tsien, R.Y., Sprengel, R., Kerr, J.N.D., Denk, W., and Hasan, M.T. Detection of Single Action Potentials in vitro and in vivo with a Genetically-encoded Activity Sensor, D3cpv., *Nature Methods*, 2008, 5(9): 797-804, PMID: 19160514
24. VanEngelenburg, S.B. and **Palmer, A.E.**, Quantification of Real-Time *Salmonella* effector Type-Three Secretion Kinetics Using the Small Molecule Fluorophore FIAsH, *Chem. Biol.*, 2008, 15(6): 619-628, PMID: 18559272
23. McCombs, J.E. and **Palmer, A.E.**, Measuring calcium dynamics in living cells with Genetically Encodable Calcium Indicators, *Methods*, 2008, 46(3): 152-159, PMID:18848629 (refereed review)
22. VanEngelenburg, S.B. and **Palmer, A.E.**, Fluorescent sensors of protein function, *Current Opinion Chemical Biol.*, 2008,12(1): 60-65, PMID: 18282482 (refereed review)
21. **Palmer, A.E.**, Dittmer, P., McCombs, J.E., Genetically encoded sensors for calcium and zinc, in Small Animal Whole-Body Optical Imaging Based on Genetically Engineered Probes, edited by A. P. Savitsky, R. E. Campbell, R. M. Hoffman, Proceedings of SPIE Vol 6868 (SPIE, Bellingham, WA, 2008), 6868-07 (non-refereed review)
20. **Palmer, A.E.**\* and Tsien, R.Y. Measuring Calcium Signaling Using Genetically Targetable Fluorescent Indicators, *Nature Protocols*, 2006, 1(2): 1-9, PMID: 17406387 (\*denotes corresponding author, refereed protocol)

**Publications from graduate and postdoctoral work**

19. Xu, C., Xu, W., **Palmer, A.E.**, and Reed, J.C., BI-1 regulates Endoplasmic reticulum Ca<sup>2+</sup> downstream of Bcl-2-family proteins, *J. Biol. Chem.*, 2008, 283(17): 11477-11484

18. **Palmer, A.E.**, Giacomello, M., Kortemme, T., Hires, S. A., Lev-Ram, V., Baker, D., Tsien R. Y., Ca<sup>2+</sup> indicators based on computationally-redesigned calmodulin-peptide pairs, *Chemistry and Biology*, 2006, 13: 521-530
  17. Duman, J.G., Chen, L., **Palmer A.E.**, Hille, B., Contributions of intracellular compartments to calcium dynamics: Implicating an acidic store, *Traffic*, 2006, 7: 859-872
  16. Qunitanar, L. Yoon, J., Aznar, C.P., **Palmer, A.E.**, Andersson, K.K., Britt, R.D., Solomon, E.I. Spectroscopic and electronic structure studies of the trinuclear Cu cluster active site of the multicopper oxidase laccase: nature of its coordination unsaturation, *J. Am. Chem. Soc.*, 2005, 127(40):13832-13845
  15. **Palmer, A.E.**, Jin, C, Reed, J.C., Tsien, R.Y., Bcl-2 mediated alterations in endoplasmic reticulum Ca<sup>2+</sup> analyzed with an improved genetically encoded fluorescent sensor, *Proc. Natl. Acad. Sci.*, 2004, 101:50, 17404-17409
- This work was highlighted in the following journals:  
*BioTechniques*, 2005, 38:1, p1; *Nature Reviews Molecular Cell Biology*, 2005, 6, p92
14. Shaner, N.C., Campbell, R.E., Steinbach, P.A., Giepmans, B.N.G., **Palmer, A.E.**, Tsien, R.Y. Improved monomeric red, orange, and yellow fluorescent proteins derived from *Discosoma* red fluorescent protein, *Nature Biotechnology*, 2004, 22, 1567-1572
  13. Andersson, K.K., Schmidt, P.P., Katterle, B., Strand, K., **Palmer, A.E.**, Lee, S.-K., Solomon, E.I., Graslund, A., Barra, A.-L. Examples of high frequency EPR studies in bioinorganic chemistry, *J. Biol. Inorg. Chem.*, 2003, 8, 235-247
  12. **Palmer, A.E.**, Szilagyi, R.K., Cherry, J.R., Jones, A., Xu, F., Solomon, E.I. Spectroscopic characterization of the Leu<sub>513</sub>His variant of fungal laccase: effect of increased axial ligand interaction on the geometric and electronic structure of the Type 1 Cu site *Inorg. Chem.*, 2003, 42, 4006-4017
  11. Campbell, R.E., Tour, O., **Palmer, A.E.**, Steinbach, P.A., Baird, G. S., Zacharias, D.A., Tsien, R.Y. A Monomeric Red Fluorescent Protein *Proc. Natl. Acad. Sci.*, 2002, 99, 7877-7882
  10. **Palmer, A.E.**, Quintanar, L., Severance, S., Wang, T.-P., Kosman, D. J., and Solomon, E.I. Spectroscopic characterization and O<sub>2</sub> reactivity of the trinuclear Cu cluster of mutants of the multicopper oxidase Fet3p, *Biochemistry*, 2002, 41, 6438-6448
  9. **Palmer, A.E.**, Lee, S.K., Solomon E. I. Decay of the Peroxide Intermediate in Laccase: Reductive Cleavage of the O-O Bond. *J. Am. Chem. Soc.* 2001, 123, 6591-6599
  8. Solomon, E.I., Chen, P., Lee, S.K., Metz, M., **Palmer, A.E.**, Oxygen binding, activation, and reduction to water by Cu proteins, *Angew. Chemie Int. Ed.*, 2001, 40:24, 4570-4590 (refereed review)
  7. Machonkin, T.E., Quintanar, L., **Palmer, A.E.**, Hassett, R.F., Severance, S., Kosman, D.J., Solomon, E.I. Spectroscopic Characterization of FET3p, a new member of the multicopper oxidase family. *J. Am. Chem. Soc.*, 2001, 123, 5507-5517
  6. **Palmer, A.E.**, Randall, D.W., Xu, F., Solomon, E.I. Spectroscopic studies and electronic structure description of the high potential type 1 copper site in fungal laccase: Insight into the effect of the axial ligand. *J. Am. Chem. Soc.* 1999, 121, 7138-7149
  5. Xu, F., **Palmer, A.E.**, Yaver, D.S., Berka, R.M., Gambetta, G.A., Brown, S.H., Solomon, E.I. Targeted Mutations in a *Trametes villosa* laccase: axial perturbations of the T1 copper. *J. Biol.Chem.* 1999, 274, 12372-12375
  4. Wilcox, D.E., Bennett, L.L., Cox, E.H., Haleblan, G., Hill, B.T., Kowack, E.P., Liu, X., Merkel, J.S., **Palmer, A.E.**, Posewitz, M.C., Roy, J.F., Wetterhahn, K.E. Interaction of Metallothionein with Carcinogenic Metals Ni(II), Cr(VI), and As(III). In: *Metallothionein IV*. Ed: Klassen, C.D. 1999, Birkhauser: Basel, p 585-594
  3. Solomon, E.I., **Palmer, A.E.**, Sundaram, U.M., Machonkin, T.E. Spectroscopic Studies of O<sub>2</sub> Intermediates in Copper Proteins: Electronic Structure Contributions to Function in Bioinorganic Chemistry. In: *Spectroscopic Methods in Bioinorganic Chemistry*. Eds: Solomon, E.I. and Hodgson, K.O. 1998, ACS: Washington, D.C., p 423-452 (refereed review)



2. Xu, F., Berka, R.M., Wahleithner, J.A., Nelson, B.A., Shuster, J.R., Brown, S.H., **Palmer, A.E.**, Solomon, E.I. Site directed mutations in fungal laccase: effect on redox potential, activity, and pH profile. *Biochemical J.* 1998, **334**, 63-70
1. Bobilya, D. J., D'Amour, K., **Palmer, A.**, Skeffington, C., Therrien, N., Tibaduiza, E. C. Isolation and cultivation of porcine brain capillary endothelial cells as an in vitro model of the blood-brain barrier. *Methods in Cell Science* 1995, **17**, 25-32

## PATENTS

- 1) U.S. Application No. 13/360,706, Title: *Optically Integrated Microfluidic Cytometer For High Throughput Screening Of Photophysical Properties of Cells or Particles*, Filed: 01/28/2012, CU TTO File No. CU2607B-US1, Inventors: Amy E. Palmer, Ralph Jimenez, Kevin M. Dean, Jennifer L. Lubbeck, Lloyd Davis. (awarded)
- 2) U.S. Application No 16/526,385, Title: Compositions and Methods for Tagging Ribonucleic Acids, Filed: July 31, 2019, VP CU File No. CU4722B-US1, Inventors: Amy E Palmer, Robert T. Batey, Esther Braselmann, Dorota Gryko (pending)

## INVITED TALKS

- 2024 Plenary speaker: Symposium on Advanced Bioinorganic Chemistry (SABIC) 2024, Kolkata, India; Invited seminar: Tata Institute for Fundamental Research Student invited seminar, Mumbai, India; Indian Institute of Technology Department of Chemistry, Mumbai, India.
- 2023 Keynote speaker: GRC Cell Biology of Metals; Conference presentations (invited talk): GRC RNA nanotechnology, Janelia Research Conference on Fluorescent Proteins and Sensors; Course Instructor: Principles and Applications of Fluorescence Microscopy (Institut Pasteur, Paris France), Advanced Quantitative Light Microscopy course (Marine Biological Laboratory, Woods Hole, MA); Seminar Speaker: UPenn (Physiology)
- 2022 Seminar speaker: University of Buffalo (Chemistry), Memorial Sloan Kettering (Chemical Biology), Speaker: Dartmouth College Wetterhahn Memorial Symposium, Course Instructor: Ecole de Physique de Les Houches "Fluorescence Markers for Advanced Microscopy: from Photophysics to Biology", Invited instructor: Marine Biological Labs, Keynote speaker: FASEB Trace Elements in Biology,
- 2021 Seminar speaker: Stanford (Student invited speaker, Chemistry), City College NY
- 2020 Seminar speaker: UC Berkeley (MCB), Caltech (Chemical Biology); Conference presentations (invited talks): Metals in Biology GRC
- 2019 Seminar speaker: UT Austin (Chemistry), UT Dallas (Chemistry), Notre Dame (Chemistry and Biochemistry, IMPACT lecture), Johns Hopkins University (Biophysics), UPenn (CBI Program). Conference presentations (invited talks): Janelia Research Campus, Gordon Research Conference on Cell Biology of Metals, International Society of Zinc Biology, Methods and Applications in Fluorescence (UCSD), NIH High Risk High Reward Symposium, Chemical Biology and Physiology Conference (OHSU)
- 2018 Conference presentation (invited talks): ASBMB Symposium on Metals in Biology (San Diego CA); Janelia Farm Research Conference on Fluorescent Proteins and Sensors; Helmholtz Pioneer Campus Conference (Venice, Italy); Current Trends in Biomedicine Workshop: Contribution of Bacterial Injection Systems to Human Disease (Baeza, Spain). Plenary Speaker. 53<sup>rd</sup> Congreso Mexicano de Quimica. Instructor. Ecole de Physique Des Houches winter school: Fluorescence Markers for Advanced Microscopy. Seminar. Cinvestav Research Institute, Mexico. Poster. NIH High Risk High Reward Research Symposium
- 2017 Seminar speaker. University of Illinois Urbana-Champaign (Chemistry-Biology Interface Program student-invited speaker); University of Arizona (Chemistry). Conference Presentation (invited talk). Biophysical Society National Meeting (New Orleans); Pittcon National Meeting (Chicago, Illinois);

- Janelia Farm Research Conference on Frontiers in Imaging Science; Biophysical Society meeting on Single Cell Biophysics (Taipei, Taiwan); MIT Neurotechnology Symposium. Invited Workshop Participant. Chan Zuckerberg Initiative: Microscopy Workshop
- 2016 Conference Presentations (invited talk). Winter-quantitative Biology Conference (Honolulu, HI); National ACS meeting (San Diego CA); Janelia Farm Research Conference. Fluorescent Proteins and Sensors. Seminar speaker. Indiana University (Chemistry); University of Minnesota (Chemistry-Biology Interface Symposium)
- 2015 Seminar speaker. Northwestern University's Chemistry of Life Processes Institute; Georgia Tech (Chemistry); Institut Pasteur (Paris, France); Ecole Normale Supérieure; Caltech (Department of Chemistry and Chemical Engineering); Washington University St. Louis School of Medicine (Department of Developmental Biology). Conference Presentations (invited talk). Mosbacher Kolloquium: Metals in Biology – Cellular Functions and Disease; German Society for Biochemistry and Molecular Biology; Pacificchem; EMBL Conference "Seeing is Believing Imaging the Processes of Life", October 2015, Talk chosen for oral presentation. Keynote Speaker. NY Academy of Sciences Symposium on "Visualizing Second Messengers"
- 2014 Conference Presentation: Janelia Farm Research Conference on Fluorescent Proteins and Sensors; International Society of Zinc Biology, Asilomar, CA. Seminar speaker: University of Colorado Anschutz Medical Campus, Program in Structural Biology and Biochemistry; University of Denver (Biology). Public talk. University Women's Club, University of Colorado
- 2013 Seminar. MIT (Chemistry), UMass (Department of Microbiology and Physiology), Novartis (Cambridge), Max Planck Institute for Biophysical Chemistry and University of Göttingen. Conference Presentation: Cell Biology of Metals GRC
- 2012 Conference Presentation: International Society for Zinc Biology Meeting (Australia), FASEB Trace Elements in Biology and Medicine, Janelia Farm Research Conference on Fluorescent Proteins and Sensors, EMBO Conference Series: Chemical Biology 2012. Seminar: UCSF (jointly sponsored CCB/iPQB Seminar Series), Arizona State University (Chemistry and Biochemistry and Biodesign Institute), UT Southwestern (Biochemistry), UC Denver (Pharmacology), Stanford University (Chemistry), Pasteur Institute, Paris, France, Carleton College (Chemistry and Biochemistry). Plenary lecture: Institute of Metals in Biology in Grenoble (France): Metal Homeostasis Workshop
- 2011 Conference Presentation (invited): American Chemical Society National Meeting, Denver: Symposium on "Advanced Microscopy Techniques for Biophysical Questions" (Physical Division); American Chemical Society National Meeting, Denver; American Society of Microbiology National Meeting, plenary speaker in "New Ways to See"; Gordon Research Conference: Cell biology of Metals; Metals in Biology Gordon Conference (Stiefel lecture). Seminar: Cornell University (Biophysics Program); Princeton University (Lewis Sigler Institute for Genomics); Duke University (Department of Chemistry); University of Wisconsin Madison (Department of Chemistry); University of Chicago (Department of Chemistry). Keynote Speaker: Dartmouth College: 20th anniversary Women In Science Project Research Symposium
- 2010 Seminar: University of Illinois at Chicago (Dept of Chemistry). Conference Presentation: FASEB Conference: Calcium and Cell Function; American Chemical Society National Meeting, Boston; INSERM International Workshop (France)
- 2009 Conference Presentation: Bioorganic Chemistry Gordon Research Conference; Metals in Cell Biology Gordon Research Conference; Janelia Farms Research Conference: Fluorescent Proteins and Biosensors; American Society for Cell Biology National Meeting: Minisymposium on Host Pathogen Interactions
- 2008 Conference Presentation: SPIE Photonics West; American Society for Cell Biology National Meeting: Minisymposium on Imaging & Sensors

- 2007 Seminar: University of Colorado at Boulder Program in Neuroscience; Biotech Symposium, University of Colorado; Butcher Symposium, University of Colorado. Conference Presentation: Janelia Farms Research Conference: Fluorescent Proteins and Biosensors
- 2006 Seminar: University of Colorado at Denver Health Sciences Center

## GRANT SUPPORT

### ***Current support:***

NIH R35 GM139644

Illuminating the biochemistry of zinc and RNA in live cells

Role: PI

Grant duration: 1/1/2021 – 12/31/2026

Beckman Foundation

Beckman Center for Light Sheet Microscopy and Data Science

Role: PI (with Kristi Anseth and Joseph Dragavon as co-PIs)

RIO Innovative Seed Grant

CU Boulder

Nutrient sensing using RNA biosensors

Grant duration: 6/1/2023 – 5/31/2024

Co-PI (with Rob Batey)

AB Nexus Seed Grant

CU System

Mechanisms of zinc-dependent maintenance of heterochromatin domains

Grant duration: 6/1/2023 – 5/31/2024

Co-PI (with Srinivas Ramachandran, CU Anschutz)

## STEM EDUCATION ACTIVITIES

### ***1. Classroom teaching***

- Fall 2005 Advanced General Biochemistry I (CHEM 5771); 5 credits  
Scientific Ethics (CHEM 5761); 1 credit
- Spring 2006 Advanced Topics in Signal Transduction and Cell Cycle Regulation (CHEM 5801); 3 credits;  
taught 2 lectures
- Fall 2006 Advanced General Biochemistry I (CHEM 5771); 5 credits  
Scientific Ethics (CHEM 5761); 1 credit
- Fall 2006 Advances in Molecular Biophysics (CHEM 5661); 3 credits; taught 2 lectures
- Fall 2007 Physical Chemistry with Biological Applications (CHEM 4411/5411); 3 credits
- Fall 2007 Chemical Biology (CHEM 5341); 3 credits, taught 1 lecture
- Spring 2008 Advanced Topics in Signal Transduction and Cell Cycle Regulation (CHEM 5801); 3 credits;  
taught 2 lectures
- Fall 2008 Physical Chemistry with Biological Applications (CHEM 4411/5411); 3 credits
- Fall 2008 Advances in Molecular Biophysics (CHEM 5661); 3 credits, taught 2 lectures
- Fall 2009 Physical Chemistry with Biological Applications (CHEM 4411/5411); 3 credits
- Fall 2010 Physical Chemistry with Biological Applications (CHEM 4411/5411); 3 credits
- Fall 2010 Advances in Molecular Biophysics (CHEM 5661); 3 credits, taught 2 lectures
- Fall 2011 Physical Chemistry with Biological Applications (CHEM 4411/5411); 3 credits
- Spring 2012 Advanced Topics in Signal Transduction and Cell Cycle Regulation (CHEM 5801); 3 credits;  
taught 2 lectures
- Spring 2014 General Chemistry for Majors (CHEM 1271); 5 credits
- Fall 2014 Advances in Molecular Biophysics (CHEM 5661); 3 credits, taught 2 lectures
- Spring 2015 General Chemistry for Majors (CHEM 1271); 5 credits

Spring 2016 Advanced Topics in Signaling and Cell Cycle Regulation (CHEM 5801); 3 credits  
Fall 2016 Foundations in Chemistry (CHEM 1400); 4 credits  
Fall 2017 Foundations in Chemistry (CHEM 1400); 4 credits  
Fall 2018 Foundations in Chemistry (CHEM 1400); 4 credits  
Spring 2021 Physical Chemistry with Biological Applications (BCHM 4400); 4 credits  
Fall 2021 Introduction to the Biochemistry Major (BCHM 1020); 1 credit – 2 sections  
Spring 2023 Physical Chemistry with Biological Applications (BCHM 4400); 4 credits

## 2. **New Course Development**

BCHM 3100 and 3110: Engineering RNA Aptamers Course-based Undergraduate Research Experience (CURE) and Literature-based co-seminar (2021-2022)

BCHM 1020: A Path to Success: Introduction to the Biochemistry Major (2021)

CHEM 1400: Foundations of Chemistry (2015-2016)

## **MENTORING**

Postdoctoral associates supervised: 14 (2 K99, 1 NIH F32, 1 Anna and John Sie Foundation)

Principal Dissertation/Thesis Advisor (graduate level): 22 students total (2 NSF, 3 NIH F31)

Member of Graduate Dissertation/Thesis Committee (other than principal advisor): over 70

Rotation Advisor for Graduate Students: 69

Undergraduate students: 45 students total, 14 honors students, 10 URMs, 28 wome)

High school students: 4

Member of Undergraduate Honors Thesis Committee (other than Principal Advisor): 17

## **SERVICE ACTIVITIES**

### **National**

#### Editorial Board Member

2021 – present, *Biochemistry*

2021 – present, *Cell Chemical Biology*

2020 – present, *Current Research in Chemical Biology* (Elsevier)

2017 – present, *Biophysical Journal*

2015 – present, *Journal of Biological Inorganic Chemistry*

#### Grant Review Panels

2020 NIH DP2 Panel

2019 NIH CMT study section – standing member (2019 – 2021, **Chair 2021-2023**)

2018 NIH DP2 Panel

2017 NIH DP2 Panel

2015 – 2017 NIH Special Emphasis Panels

2014 NSF CAREER Panel, Chemistry of Life Processes Program

2010-2014 NIH MSFA Study Section, standing member

2009 NIH MSFA Study Section, ad hoc reviewer, 2 cycles

2008 NIH MI Study Section, ad hoc reviewer

2008 – present: mail reviews for NSF, NSERC, Alzheimer's Association

#### Advisory Committees

2019 SERP Institute

2017 HHMI Janelia Research Campus, GENIE project

2015 American Chemical Society, National search for Editor-in-Chief of new ACS Journal

2015 HHMI Janelia Research Campus, GENIE project

#### Conference organization

- 2018 ASBMB, Organize “Metals in Biology” Session
- 2017 American Chemical Society National Meeting (August), Organize Bioinorganic Chemistry Symposium
- 2015 Chair, Gordon Research Conference Cell Biology of Metals
- 2013 Vice Chair, Gordon Research Conference Cell Biology of Metals
- 2010 American Chemical Society National Meeting (April), 3-day symposium for Physical Division on “Metals in Biology”

Other

- 2005 – present: Journal reviewer, e.g. *Nature*, *Science*, *Cell*, *Nature Methods*, *Nature Chemical Biology*, *Nature Chemistry*, *Nature Communications*, *Chemical Reviews*, *JACS*, *Angewandte Chemie*, *Chemistry and Biology*, *ACS Chemical Biology*, etc.; typically review 10-15 papers per year
- 2008 – 2009: Guest Editor *Chemical Reviews* “Cellular Metal Trafficking and Regulation” thematic issue
- 2020: Guest Editor *Current Opinion Chemical Biology* “Molecular Imaging”

**University level**

- 2023 – present: Director, Arts and Sciences Honors Program
- 2021 – 2023: Vice Chancellors Advisory Committee
- 2017 – 2018: Foundations of Excellence committee: Learning Dimension
- 2012 – present: Faculty Director, BioFrontiers Advanced Imaging Core Facility
- 2012 – present: Advisory Board, BioFrontiers Advanced Imaging Core Facility
- 2016 – 2018: Advisory Board for TRESTLE (Transforming Education, Supporting Teaching and Learning Excellence) Project at CU Boulder
- 2007 – present: NIH Biophysics Training Grant Steering Committee, alternating years
- 2013 – 2014: Executive Leadership Program
- 2007 – 2015: Colorado Clinical and Translational Sciences Institute (CCTSI) Grant Review Board
- 2008 – 2010: CU Innovative Seed Grant Reviewer for Vice Chancellor’s Office

**Department/Institute Level**

Leadership

- 2018 – 2023 Associate Chair of Undergraduate Affairs, Biochemistry
- 2016 – 2023 BioFrontiers Executive committee
- 2005 – present BioFrontiers Council
- 2013 – 2015 Department Executive Committee

Faculty Search Committees

- 2013 – 2014 Chair, Biochemistry Search Committee (Sabrina Spencer)
- 2011 – 2012 Member, Biochemistry Search Committee (Senior hire: Roy Parker)
- 2007 – 2008 Member, BioFrontiers Search Committee (Biophysics Search)
- 2006 – 2007 Member, Organic Chemistry Search Committee

Curriculum

- Shared Undergraduate Instruction Committee (2017 – 2018 Co-Chair, 2018 – 2019, Member)
- Biochemistry Curriculum committee (2016 – 2018)
- General Chemistry Curriculum committee (2014 – 2018)
- Department-wide Curriculum committee (2016 – 2017)
- Biochemistry PhD Committee (2005 – 2007)

Other

- 2009 – 2012 Graduate recruiting
- 2010 – 2012 Diversity committee