

Mary Teruel, Ph.D.

Assistant Professor, Dept. of Chemical and Systems Biology
Stanford University School of Medicine
269 Campus Drive, CCSR 3155B
Stanford, CA 94305-5174

Email: mteruel@stanford.edu

Lab Webpage: <https://teruel.stanford.edu/>

Education

- 1998-2000 Postdoctoral Fellow, Dept. of Cell Biology. Duke University, Durham, NC.
- 1996 Ph.D. in Aeronautical Engineering, Stanford University, Stanford, CA.
- 1989 M.S. in Aeronautical Engineering, Stanford University, Stanford, CA.
- 1985 B.S. in Mechanical Engineering, University of Pennsylvania, Philadelphia, PA. Admitted 1 year early from high school. Recipient of Henry Jayne LeBarre Prize for best English Composition by a member of the Freshman Class (class of 2000 freshman).

Current Professional Experience

- 2017- Member of the Stanford Diabetes Research Center
- 2016- Assistant Professor (by courtesy), Dept. of Bioengineering, Stanford University, Stanford, CA.
- 2015- Faculty Fellow, Stanford Institute for Chemistry, Engineering, and Medicine for Human Health (CHEM-H)
- 2014- Member of the Stanford Cancer Institute
- 2013- Co-Investigator and Co-Director of the Technology Core, Stanford NIH Center for Systems Biology (P50)
- 2012- Member of the Stanford Cardiovascular Institute
- 2012- Assistant Professor, Dept. of Chemical and Systems Biology, Stanford University, Stanford, CA.

Previous Professional Experience

- 2007-2011 Senior Research Scientist, Dept. of Chemical and Systems Biology, Stanford University, Stanford, CA. Developed high-throughput proteomics and genomic strategy combining mass spectrometry, bioinformatics, mass spectrometry, RNAi and DNA construct libraries, single-cell fluorescence imaging in 96-well format, and image analysis to identify the molecular players and mechanisms controlling adipocyte cell function.
- 2007-2009 Visiting Scientist with Professor Ruedi Aebersold, Institute for Molecular Systems Biology, ETH Zürich, Zürich, Switzerland. Developed selective-reaction monitoring (SRM) mass spectrometry techniques for monitoring networks of low-abundant signaling proteins involved in calcium and insulin/PIP3 signaling.

- 2000 -2006 Senior Research Scientist, Dept. of Molecular Pharmacology, Stanford University, Stanford, CA. Developed the first low resolution total-internal reflection microscopy imaging system (ESCAT) where plasma-membrane translocation can be measured simultaneously in thousands of individual cells. Used this system to carry out single-cell kinetic studies of Ca²⁺ and lipid second messenger signaling.
- 2000 -2005 Microscopy, Imaging, and Analysis Consultant for the Alliance for Cellular Signaling.
- 1998-2000 Postdoctoral Fellow, Dept. of Cell Biology, Duke University. Durham, NC.
- 1995-1998 Microscopy Engineer, Dept. of Cell Biology, Duke University, Durham, NC. Designed, built and implemented microporation device, dual-color confocal microscope, video-rate image capturing system, and other biomedical instrumentation. Carried out first published CFP/YFP FRET confocal imaging study. Responsible for design and initial setup of two-photon microscopy facility for 5-laboratory group.
- 1989-1995 Research Assistant, NASA Ames Research Center and the Dept. of Mechanical Engineering, Thermosciences Division, Stanford University.
- 1988-1989 Research Assistant, Dept. of Aeronautics and Astronautics, Stanford University. Developed computational fluid dynamics computer programs to model hypersonic duct flow.
- 1988 Research Assistant, Dept. of Electrical Engineering, Stanford University. Space Shuttle Electrodynamic Tether System Mission.
- 1986-1987 Test Engineer, Kronos Incorporated, Waltham, MA.
- 1985-1986 Helicopter Structural Test Engineer, Kaman Aerospace Corporation, Bloomfield, CT.

Honors

- 2018 Recipient of the Stanford McCormick/Gabilan Award given to a faculty member at Stanford for their work in supporting the mentoring, training and encouragement of women pursuing the study of medicine, in teaching medicine, and engaging in medical research.
- 2018 Recipient of the inaugural Diabetes Knowledge Award (DKA) awarded by the Stanford Diabetes Research Center for the most impactful, original diabetes-related publication from Stanford in 2017-2018.
- 2013–present Stanford Gabilan Fellow
- 2007 Biochemical Journal Young Investigator Award
- 2000-2006 National Institutes of Health (NIH) Quantitative Mentored Career Development Award
- 1998-2001 National Institutes of Health Postdoctoral Fellowship
- 1989–1993 National Air and Space Administration (NASA) Graduate Student Fellowship

Grants

Current and Recent Funding

- NIH RO1 1-R01-DK101743-01** Teruel (PI) 2/1/15-1/31/20
"Controlling the rate of terminal cell differentiation: experiments and theory"
- NIH RO1 1-R01-DK106241-01** Teruel (PI) 8/1/15-7/31/20
"Controlling tissue size by noise and feedback"
- NIH RO1- DK114217** Feldman (PI) 7/1/17-6/30/22
"Integrated Systemic and Adipose Depot-Specific Regulation of Adipogenesis"
Role: Co-Investigator
- NIH 1 P50 GM107615-01** Ferrell (PI) 7/1/13 – 6/30/18
"Systems Biology of Collective Cell Decisions"
The overarching aim of this Center is to understand the systems-level basis for cellular decision-making in the interrelated processes of proliferation, migration, and differentiation.
Role: Co-Investigator and Co-Director of Technology Core
- BioX Seed Grant** Teruel (PI) 10/1/14-9/30/18
"Hormonal control of fat cell differentiation"
- McCormick/Gabilan Faculty Award** Teruel (PI) 9/1/18-8/31/20
"Preventing osteoporosis in long-term glucocorticoid treatment and aging by controlling the mesenchymal stem cell (MSC) to bone-or-fat cell switch"

Refereed Publications

Original Peer-reviewed Research Publications (starting with most recent)

1. Zhao ML, Rabiee AR, Kovary KM, Bahrami-Nejad Z, Taylor B, **Teruel MN**. (2019). Stochastic regulation of the duration of a dedicated extended G1 period controls terminal cell differentiation and cell cycle exit. *BioRxiv* DOI 10.1101/604231.
2. Bielczyk-Maczynska E, Taylor B, Miller C, Zhao ML, Shah A, Bahrami-Nejad Z, Dunn AR, **Teruel MN**. (2019). Loss of adipocyte identity through synergistic repression of PPARG by TGF- β and mechanical stress. *BioRxiv* DOI 10.1101/604231.
3. Kovary KM, Taylor B, Zhao ML, **Teruel MN**. (2018). Expression variation and covariation impair analog and enable binary signaling control. *Mol Syst Biol*. May 14;14(5):e7997. DOI: 10.1525/msb.20177997. PubMed PMID: 29759982; PubMed Central PMCID: PMC5951153.
4. Bahrami-Nejad Z*, Zhao ML*, Hunderdosse D, Tkach KE, van Schie S, Chung M, and **Teruel MN**. (2018). A transcriptional circuit filters oscillating circadian hormonal inputs to regulate fat cell differentiation. *Cell Metabolism* Apr 3, 27(4):854-868.e8. doi: 10.1016/j.cmet.2018.03.012. PubMed PMID: 29617644. *equal contribution.
 - Highlighted in *Nature*, *NIH Research Matters*, *ScienceNews*, *F1000-the Faculty of 1000*, *the Times (London)*, *ABC News*, *CBS News*, *the Los Angeles Times*, *Reuters*.
 - Awarded the inaugural *Diabetes Knowledge Advancement (DKA) Award* by the *Stanford Diabetes Research Center*, given to the most impactful, original diabetes-related research publication from Stanford (2017-2018).

5. Shi Z, Fujii K, Kovary KM, Genuth NR, Röst HL, **Teruel MN**, Barna M. (2017). Heterogeneous Ribosomes Preferentially Translate Distinct Subpools of mRNAs Genome-wide. *Molecular Cell* Jul 6;67(1):71-83.e7. Epub 2017 Jun 15. PubMed PMID: 28625553.
6. Ahrends R, Niewiadomski P, **Teruel MN**, Rohatgi R. (2015). Measuring Gli2 phosphorylation by selected reaction monitoring mass spectrometry. *Methods Mol Biol.* 1322:105-23. PMID: 26179043.
7. Ota A, Kovary KM, Wu OH, Ahrends R, Costa MJ, Shen W, Feldman BJ, Kraemer FB, **Teruel MN**. (2015). Using SRM mass spectrometry to profile nuclear protein abundance differences between adipose tissue depots of insulin resistant mice. *Journal of Lipid Research* 56(5):1068-78. PMID: 25840986.
8. Khor VK, Ahrends R, Shen W, Cortez Y, **Teruel MN**, Salman A, and Kraemer FB. (2014). The proteome of cholesteryl-ester-enriched versus triacylglycerol-enriched lipid droplets. *Plos One.* Aug 11; 9(8):e105047. PMID: 25111084.
9. Ahrends R, Ota A, Kovary KM, Kudo T, Park BO, **Teruel MN**. (2014). Controlling low rates of cell differentiation through noise and ultra-high feedback. *Science* Jun 20; 344:1384-9. PMID: 24948735. Awarded an Editors' Choice rating by the Science magazine signaling editors.
10. Niewiadomski P, Kong J, Ahrends R, Ma Y, Humke EW, Khan S, **Teruel MN**, Novitch BG, Rohatgi R. (2014). Gli protein activity is controlled by multi-site phosphorylation in vertebrate Hedgehog signaling. *Cell Reports* Jan 16; 6(1):168-81. Epub 2013 Dec 27. PMID: 24373970.
11. Chu BW, Kovary KM, Guillaume J, Chen LC, **Teruel MN**, Wandless TJ. (2013). The E3 Ubiquitin Ligase UBE3C Enhances Proteasome Processivity by Ubiquitinating Partially Proteolyzed Substrates. *J. Biol. Chem.* Nov 29; 288(48): 34575-87. Epub 2013 Oct 24. PMID: 24158444.
12. Park BO, Ahrends R, **Teruel MN**. (2012). Consecutive positive feedback loops create a bistable switch that controls preadipocyte to adipocyte conversion. *Cell Reports* Oct 25; 2(4): 976-90. Epub 2012 Oct. 11. PMID: 23063366
13. Abell E*, Ahrends R*, Bandara S, Park BO, **Teruel MN**. (2011). Parallel adaptive feedback enhances reliability of the Ca²⁺ signaling system. *Proc Natl Acad Sci U S A.* Aug 30; 108(35): 14485-90. Epub 2011 Aug 15. *equal contribution. Awarded a "Must Read" and "Exceptional" rating by the Faculty of 1000.
14. Hillman RT, Feng BY, Ni J, Woo WM, Milenkovic L, Hayden Gephart MG, **Teruel MN**, Oro AE, Chen JK, Scott MP. (2011). Neuropilins are positive regulators of Hedgehog signal transduction. *Genes Dev.* Nov 15; 25(22): 2333-46. Epub 2011 Nov 3. PMID: 22051878.
15. Park WS, Heo WD, Whalen JH, O'Rourke NA, Bryan HM, Meyer T, **Teruel MN**. (2008). Identification of PIP3-regulated Proteomes from C.elegans to human by Model Prediction and Live Imaging. *Molecular Cell* May 9; 30(3): 381-92. PMID: 18471983.
16. Galvez T, **Teruel MN**, Heo WD, Jones JT, Kim ML, Liou J, Myers JW, Meyer T. (2007). An siRNA screen of the signaling proteome identifies the PI3K-mTOR signaling pathway as a regulator of transferrin uptake. *Genome Biol.* 8(7): R142. PMID: 17640392.
17. Sano H, Eiguez L, **Teruel MN**, Fukuda M, Chuang TD, Chavez JA, Lienhard GE, McGraw TE. (2007). Rab10, a target of the AS160 Rab GAP, is required for insulin-stimulated translocation of GLUT4 to the adipocyte plasma membrane. *Cell Metabolism* 2007 Apr;5(4):293-303. PMID:17403373.

18. Tengholm A, **Teruel MN**, Meyer T. (2003). Single cell imaging of PI3-kinase activity and glucose transporter insertion into the plasma membrane by dual color evanescent wave microscopy. **Science Signaling**. Feb 11;2003(169):PL4. PMID:12582202.
19. **Teruel MN**, Meyer T. (2002). Parallel Single Cell Monitoring of Receptor-Triggered Membrane Translocation of a Calcium Sensing Protein Module. **Science**. Mar 8;295(5561):1910-2. PMID:11884760. *Awarded an "Editors' Choice" rating by the Science Magazine signaling editors.*
20. Codazzi F, **Teruel MN**, Meyer T. (2001). Control of Astrocyte Ca²⁺ Oscillations and Waves by Oscillating Translocation and Activation of Protein Kinase C. **Current Biology** Jul 24;11(14):1089-97. PMID:11509231
21. Shen K, **Teruel MN**, Connor JH, Shenolikar S, Meyer T. (2000). Molecular memory by reversible translocation of calcium/calmodulin-dependent protein kinase II. **Nature Neuroscience** Sep;3(9):881-6. PMID:10966618
22. Haugh JM, Codazzi F, **Teruel MN**, Meyer T. (2000). Spatial Sensing in Fibroblasts Mediated by 3' Phosphoinositides. **J Cell Biol**. Dec 11;151(6):1269-80. PMID: 11121441
23. Botelho RJ, **Teruel MN**, Dierckman R, Anderson R, Wells A, York JD, Meyer T, Grinstein S. (2000). Localized Biphasic Changes in Phosphatidylinositol-4,5-Bisphosphate at Sites of Phagocytosis. **J Cell Biol**. Dec 25;151(7):1353-68. PMID: 11134066.
24. **Teruel MN**, Chen W, Persechini A, Meyer T. (2000). Differential codes for free Ca²⁺-calmodulin signals in nucleus and cytosol. **Current Biology** Jan 27;10(2):86-94. PMID:10662666.
25. Shen K, **Teruel MN**, Subramanian K, Meyer T. (1998). CaMKIIbeta functions as an F-actin targeting module that localizes CaMKIIalpha/beta heterooligomers to dendritic spines. **Neuron** Sep;21(3):593-606. PMID:9768845.
26. **Teruel MN**, Blanpied TA, Shen K, Augustine GJ, Meyer T. (1999). A versatile microporation technique for the transfection of CNS neurons. **J. Neuroscience Methods** 93: 37-48. PMID:10598863.
27. Oancea E, **Teruel MN**, Quest AF, Meyer T. (1998). GFP-tagged cysteine-rich domains from Protein Kinase C as fluorescent indicators for diacylglycerol signaling in living cells. **J Cell Biol**. Feb 9;140(3):485-98. PMID: 9456311.
28. **Teruel MN**, Meyer T. (1997). Electroporation-induced Formation of Individual Calcium Entry Sites in the Cell Body and Filopodia of Adherent Cells. **Biophys J**. Oct;73(4):1785-96. PMID: 9336174.

Peer-reviewed Reviews

1. **Teruel MN**, Gu B, Zhao ML. (2015). A dynamic picture of protein behavior in cells. **Nature Biotechnology** Apr 7; 33(4):356-357. PMID 25850058.
2. **Teruel MN**, Meyer T. (2003). Fluorescence imaging of signaling networks. **Trends in Cell Biology** 13(2): 101-6. PMID: 12559761.
3. **Teruel MN**, Meyer T. (2000). Translocation and reversible localization of signaling proteins: a dynamic future for signal transduction. **Cell** 103: 181-4. PMID: 11057890.

Other Publications

Teruel MN. (1996). An experimental and computational study of the flow in the endwall region of a turbine cascade passage. Ph.D. Thesis, Dept. of Aeronautics and Astronautics, Stanford University and Thermosciences Division Report No. MD-74, Dept. of Mechanical Engineering, Stanford University.

Invited Lectures

- November 2019 ICSB 2019 - 20th International Conference on Systems Biology, Chair and speaker in session on "Developmental Systems Biology", Okinawa, Japan.
- October 2019 University of Cincinnati and Cincinnati Children's Hospital Research Foundation, Cincinnati, OH.
- June 2019 Gordon Research Conference on Developmental Biology, Mount Holyoke, MA.
- April 2019 University of Chicago, Committee on Molecular Metabolism and Nutrition Program (Students' Choice, invited by the graduate students in the program), Chicago, IL.
- March 2019 "Control of cell differentiation by the timing of physiological oscillators", CHSL Meeting on Systems Biology: Networks, Cold Spring Harbor, NY.
- February 2019 "Control of cell differentiation by the timing of physiological oscillators", 2019 Winter Qbio Meeting, Oahu, Hawaii.
- January 2019 "Control of cell differentiation by the timing of physiological oscillators", Keystone Symposia on Signal Dynamics and Signal Integration in Development and Disease, Keystone, CO.
- January 2019 "Control of cell differentiation by feedback, noise, and oscillation timing," Boston University, Dept. of Biomedical Engineering, Boston, MA
- January 2019 "Control of cell differentiation by feedback, noise, and oscillation timing," Boston University, Dept. of Biochemistry, Boston, MA
- December 2018 "Control of cell differentiation by feedback, noise, and oscillation timing," Weill-Cornell School of Medicine, Dept. of Biochemistry, New York City, NY.
- December 2018 "Control of cell differentiation by feedback, noise, and oscillation timing," American Society of Cell Biology (ASCB) Annual Meeting, Session on Systems and Synthetic Biology of Decoding Complex Cellular Rhythms, San Diego, CA.
- December 2018 "Control of cell differentiation by feedback, noise, and oscillation timing," University of Michigan, Dept. of Biomedical Engineering, Ann Arbor, MI.
- December 2018 "Control of cell differentiation by feedback, noise, and oscillation timing," UC Santa Cruz; Dept. of Molecular, Cell, and Developmental Biology; Santa Cruz, CA.
- October 2018 "Control of mammalian cell differentiation by feedback and noise," UC Berkeley, Dept. of Bioengineering, Berkeley, CA.
- July 2018 "Control of mammalian cell differentiation by feedback and noise," Green Center of Systems Biology and Dept. of Cell Biology, UT Southwestern, Dallas, TX.
- July 2018 "Control of mammalian cell differentiation by feedback and noise," Cold Spring Harbor Course on Single Cell Analysis, Cold Spring Harbor, NY.

- July 2018 "Control of mammalian cell differentiation by feedback and noise," The Francis Crick Institute, London, England.
- May 2018 "Control of mammalian cell differentiation by feedback and noise," Solvay Workshop on "Dynamics of biological systems: Modelling genetic, signaling and microbial networks", The International Solvay Institutes, Universite Libre de Bruxelles, Brussels, Belgium.
- May 2018 "Control of mammalian cell differentiation by feedback and noise," Quantitative Biology Seminar Series, UC San Diego, San Diego, CA. "Students' choice". Invited by the graduate students in the UCSD Quantitative Biology PhD program.
- March 2018 "Control of mammalian cell differentiation by feedback and noise," Dept. of Cell Biology and Institute of Cell Dynamics, Johns Hopkins University, Baltimore, MD.
- March 2018 "Control of mammalian cell differentiation by feedback and noise," SysBio 2018: 8th Advanced Lecture Course on Systems Biology, Innsbruck, Austria.
- January 2018 "Control of mammalian cell differentiation by feedback and noise," Institute of Genomics and Systems Biology, University of Chicago, Chicago, IL.
- January 2018 "Control of mammalian cell differentiation by feedback and noise," Dept. of Systems Biology, Harvard University, Cambridge, MA.
- November 2017 "A core component of mature adipocytes enforces cell identity by mediating adipocyte differentiation", Stanford Diabetes Research Center Symposium, Stanford, CA.
- November 2017 "Feedback control and noise in mammalian cell differentiation", Institute of Systems Biology and Dept. of Biomedical Engineering, Yale University, New Haven, CT.
- May 2017 "Feedback control of mammalian cell differentiation", First Latin American Workshop and Conference on Systems Biology, Mexico City, Mexico.
- April 2017 "Molecular mechanisms controlling adipocyte differentiation", Stanford Diabetes Symposium, Stanford, CA.
- February 2017 "A circadian signaling code restricts the rate of cell differentiation", Fifth Annual Quantitative Biology (q-Bio) Conference, Kauai, Hawaii.
- January 2017 "A circadian signaling code restricts the rate of cell differentiation", Keystone Symposia on Obesity and Adipocyte Biology, Keystone, CO.
- January 2017 "A circadian signaling code restricts the rate of cell differentiation", UCSF/Gladstone Institutes Convergence Seminar Series, UC San Francisco, San Francisco, CA.
- January 2017 "A circadian signaling code restricts the rate of cell differentiation", Stanford Bioengineering Dept. Seminar, Stanford, CA.
- November 2016 "A circadian signaling code restricts fat cell differentiation", NIH/NIDDK Workshop on the Adipose Tissue Niche, Bethesda, MD.
- October 2016 "Molecular mechanisms controlling mammalian cell differentiation", University of Mississippi Medical Center, Jackson, Mississippi.
- October 2016 "Feedback control of mammalian cell differentiation", Biozentrum and University of Basel, Basel, Switzerland.
- July 2016 "Transcription factor dynamics define a circadian code for fat cell differentiation", q-bio 2016: Quantitative and Systems Biology Conference, Nashville, TN.

- June 2016 "Transcription factor dynamics define a circadian code for fat cell differentiation", Japanese Society of Cell Biology Annual Meeting, Kyoto, Japan.
- February 2016 "A circadian code for fat cell differentiation", Stanford Bio-X IIP Symposium, Stanford, CA.
- February 2016 "Feedback control of mammalian cell differentiation", Biophysical Society Annual Meeting, Symposium on Synthetic Biology and Systems Biology, Los Angeles, CA.
- January 2016 "A circadian code for fat cell differentiation", Stanford Cardiovascular Institute, Stanford, CA.
- December 2015 "A circadian code for fat cell differentiation", Minisymposium on Signaling and Differentiation, American Society of Cell Biology (ASCB) Annual Meeting, San Diego, CA.
- November 2015 "Feedback control of mammalian cell differentiation", Dept. of Biomedical Engineering, Georgia Institute of Technology and Emory University, Atlanta, Georgia.
- October 2015 "Controlling tissue size with noise and ultra-high feedback", Keystone Symposium on Diabetes: New Insights into Molecular Mechanisms and Therapeutic Strategies, Kyoto, Japan.
- September 2015 "Controlling tissue size with noise and ultra-high feedback", 14th Human Proteome Organization World Congress – HUPO 2015, Session on Protein Networks and Systems Biology, Vancouver, Canada.
- August 2015 "Feedback control of mammalian cell differentiation", EMBO workshop on Cell and Developmental Systems, Arolla, Switzerland.
- July 2015 "Feedback control of mammalian cell differentiation", International Conference on the Systems Biology of Disease, German Cancer Institute, Heidelberg, Germany.
- May 2015 "Feedback control of mammalian cell differentiation", Program in Vascular Biology, UCLA, Los Angeles, CA.
- April 2015 "Feedback control of mammalian cell differentiation", Friedrich Miescher Institute (FMI) for Biomedical Research, Basel, Switzerland.
- April 2015 "Feedback control of mammalian cell differentiation", EMBO|EMBL Symposium: Cellular Heterogeneity: Role of Variability and Noise in Biological Decision-Making, Heidelberg, Germany.
- March 2015 "Feedback control of mammalian cell differentiation", Society for Developmental Biology, West Coast Meeting, Yosemite, CA.
- February 2015 "Feedback control of mammalian cell differentiation", Third Annual Winter Quantitative Biology (q-bio) Conference, Maui, Hawaii.
- December 2014 "Controlling the size of tissue with stochastic noise," Minisymposia on Cell Signaling and Decision Making, American Society of Cell Biology (ASCB) Annual Meeting, Philadelphia, PA.
- October 2014 "Controlling the size of tissue with stochastic noise", Stanford Regenerative Medicine Seminar, Stanford, CA.
- October 2014 "Controlling low rates of adipogenesis with noise and ultra-high feedback," Cell Press Symposia: Systems Approach to Metabolic Diseases, Chicago, IL.

- July 2014 "Controlling low rates of terminal cell differentiation with noise and ultra-high feedback," NIH National Centers for Systems Biology Annual Meeting, San Diego, CA.
- June 2014 "Feedback control of cell differentiation", Sanofi/Aventis, Frankfurt, Germany.
- February 2014 "Controlling low rates of terminal cell differentiation with noise and ultra-high feedback," Second Annual Winter q-bio Conference, Kona, Hawaii.
- October 2013 "Feedback control of cell differentiation," Stanford Biology Thinks Big Symposium, Stanford, CA.
- October 2013 "Feedback control of cell differentiation," University of Chicago, Institute of Genomics and Systems Biology, Chicago, IL.
- August 2013 "Feedback control of cell differentiation," q-bio 2013 Conference on Cellular Information Processing, St. Johns College, Santa Fe, NM.
- June 2013 "Controlling the rate of terminal cell differentiation," The International Conference on the Systems Biology of Disease, German Cancer Institute, Heidelberg, Germany.
- November 2012 "Fat or no fat: breaking the code of a key cellular decision process," EMBL Symposium: From Functional Genomics to Systems Biology, Heidelberg, Germany
- November 2012 "Fat or no fat: breaking the code of a key cellular decision process," Uppsala University, Department of Medical Cell Biology, Uppsala, Sweden.
- July 2012 "Fat or no fat: breaking the code of a key cellular decision process," Kern Lipid Conference on Systems Biology, Lipidomics and Cardiometabolic Diseases, Aspen, CO.
- March 2012 "Using single-cell imaging and Selective Reaction Monitoring (SRM) mass spectrometry to unmask the feedback loops controlling adipogenesis", U.S. Human Proteome Organization (HUPO) Annual Meeting, San Francisco, CA.
- February 2012 "Fat or no fat: breaking the code of a key cellular decision process," Stanford Regenerative Medicine Seminar, Stanford, CA.
- Sept. 2011 "Using selective reaction monitoring (SRM) mass spectrometry to quantify protein copy number and robustness in the calcium signaling network", Stanford University Mass Spectrometry Users Annual Meeting, Stanford, CA.
- Sept. 2011 "Fat or no fat: breaking the code of a key cellular decision process," Obesity Summit, Stanford University, Stanford, CA.
- August 2011 "Fat or no fat: breaking the code of a key cellular decision process," U.C. Berkeley, Dept. of Nutritional Science and Toxicology, Berkeley. CA.
- March 2011 "Using single-cell imaging and Selective Reaction Monitoring (SRM) mass spectrometry to unmask the feedback loops controlling adipogenesis", U.S. Human Proteome Organization (HUPO) Annual Meeting, Raleigh, NC.
- February 2011 "Using single-cell imaging and Selective Reaction Monitoring (SRM) mass spectrometry to unmask the feedback loops controlling adipogenesis", Stanford University Dept. of Endocrinology, Stanford, CA.
- June 2010 "Using selective reaction monitoring (SRM) mass spectrometry to quantify protein copy number and robustness in the calcium signaling network", FASEB Summer Research Conference on Calcium and Cell Function, Steamboat Springs, CO.

- May 2010 "Using selective reaction monitoring (SRM) mass spectrometry to quantify protein copy number and robustness in the calcium signaling network", American Society of Mass Spectrometry Annual Meeting, Salt Lake City, Utah.
- April 2010 "A functional proteomics approach to understand the fat cell signaling network," American Society of Biochemistry and Molecular Biology (ASBMB) Annual Meeting, Anaheim, CA.
- April 2010 "A functional proteomics approach to understand the fat cell signaling network," Stanford University Cardiovascular Institute Symposium, Stanford, CA.
- June 2008 "Control of plasma membrane translocation: dynamics insights into the logic of cell signaling," Frontiers in Membrane Biology Symposium, Kobe, Japan.
- April 2008 "Control of plasma membrane translocation: dynamics insights into the logic of cell signaling," Duke University, Dept. of Pharmacology, Durham, NC.
- April 2008 "Control of plasma membrane translocation: dynamics insights into the logic of cell signaling," Max Planck Institute for Biochemistry, Martinsreid, Germany
- March 2008 "Control of plasma membrane translocation," University of Pennsylvania, Dept. of Bioengineering, Philadelphia, PA.
- February 2008 "Control of plasma membrane translocation," UCLA Dept. of Physiological Sciences, Los Angeles, CA.
- November 2007 "Understanding lipid second messenger signaling networks," Janelia Farm Research Conference on Phosphoinositides, Howard Hughes Medical Institute, Ashburn, VA.
- September 2007 "Understanding lipid second messenger signaling networks," ETH Zürich, Institute of Molecular Systems Biology, Zurich, Switzerland.
- August 2007 "Identification of PIP3-regulated Proteomes from C.elegans to human by Model Prediction and Live Imaging," FASEB Conference on Glucose Transporters, Snowmass, CO.
- July 2002 "Parallel Single Cell Monitoring of Receptor-Triggered Membrane Translocation of a Calcium Sensing Protein Module," Innovative Molecular Analysis Technologies (IMAT) Meeting, NIH/NCI, Chantilly, VA.
- June 2002 "Parallel Single Cell Monitoring of Receptor-Triggered Membrane Translocation of a Calcium Sensing Protein Module," FASEB Conference on Calcium Signaling and Cell Function, Salt Lake City, Utah.
- April 2002 "Parallel Single Cell Monitoring of Receptor-Triggered Membrane Translocation of a Calcium Sensing Protein Module," Merck Pharmaceuticals, North Wales, PA.
- September 2000 "Fluorescence imaging of signaling networks," Max Planck Institute, Goettingen, Germany.
- August 1999 "Fluorescence imaging of signaling networks," Microscopy Society of America Annual Meeting, Portland, OR. Session on Novel Approaches to Microscopy of Living Cells
- July 1998 "Electroporation-induced Formation of Individual Calcium Entry Sites in the Cell Body and Filipodia of Adherent Cells," Gordon Research Conference on Bioelectric Fields, Henniker, NH.

Teaching Experience

July 2018	Lecturer, CSHL Course on Single Cell Analysis, Cold Spring Harbor, NY.
Spring 2018	Directed and taught the 3-unit Stanford University Graduate Student Course: <i>Biological Light Microscopy (CSB222)</i> .
March 2018	Lecturer, SysBio 2018: 8th Advanced Lecture Course on Systems Biology, Innsbruck, Austria.
Fall 2017	Directed and taught the Stanford University Graduate Student Course: <i>Current Research in Chemical and Systems Biology (CSB 270)</i>
May 2017	Lecturer, First Latin American Workshop and Conference on Systems Biology, Mexico City, Mexico.
Winter 2017	Instructor in the Stanford University Graduate Student Course: <i>Cell Signaling (CSB 210)</i>
Spring 2017	Designed, directed, and taught the 3-unit Stanford University Graduate Student Course: <i>Biological Light Microscopy (CSB222)</i> . This intensive laboratory and discussion course provides participants with the theoretical and practical knowledge to utilize emerging imaging technologies based on light microscopy. Topics include microscope optics, limits of resolution, Köhler illumination, physics of fluorescence, principles of confocal, two-photon, TIRF, FRET, photobleaching, super-resolution (SIM, STED, STORM/PALM), tissue clearing/CLARITY/light-sheet microscopy, and live-cell imaging. Lab portion involves extensive in-class use of microscopes in the CSIF and NMS core microscopy facilities.
Spring 2017	Directed and taught the Stanford University Graduate Student Course: <i>Current Research in Chemical and Systems Biology (CSB 270)</i>
Winter 2017	Directed and taught the Stanford University Graduate Student Course: <i>Current Research in Chemical and Systems Biology (CSB 270)</i>
Winter 2016	Instructor in the Stanford University Graduate Student Course: <i>Cell Signaling (CSB 210)</i>
Fall 2016	Director of the Stanford University Graduate Student Course: <i>Current Research in Chemical and Systems Biology (CSB 270)</i>
Winter 2015	Instructor in the Stanford University Graduate Student Course: <i>Cell Signaling (CSB 210)</i>
Fall 2014	Directed and taught the Chemical and Systems Biology Incoming Student Bootcamp
Winter 2014	Instructor in the Stanford University Graduate Student Course: <i>Cell Signaling (CSB 210)</i>
Winter 2013	Lecturer in the Stanford University Graduate Student Course: <i>Cell Signaling (CSB 210)</i>
Fall 2013	Co-Director of the Chemical and Systems Biology Incoming Student Bootcamp
Fall 2012	Developed, directed, taught the 10-week Stanford University Graduate Student Course: <i>Current Topics in Proteomics (CSB 230)</i>
Winter 2012	Lecturer in the Stanford University Graduate Student Course: <i>Cell Signaling (CSB 210)</i>

Winter 2011	Lecturer in the Stanford University Graduate Student Course: <i>Systems Biology (CSB 278)</i>
Winter 2010	Lecturer in Stanford University Graduate Student Course: <i>Cell Signaling (CSB 210)</i>
Winter 2009	Lecturer in the Stanford University Graduate Student Course: <i>Cell Signaling (CSB 210)</i>
Fall 2010	Director of the Stanford University Graduate Student Course: <i>Current Research in Chemical and Systems Biology (CSB 270)</i>
Spring 2004, 2005	Lecturer in the 10-week Stanford University Graduate Student Course: <i>Imaging and Biological Light Microscopy</i>
Spring 2003	Directed and taught the 10-week Stanford University Graduate Student Course: <i>Imaging and Biological Light Microscopy</i>
Spring 2001	Lecturer in the 10-week Stanford University Graduate Student Course: <i>Imaging and Biological Light Microscopy</i>
Sept 2000	Faculty member for the 10-day EMBO Course on <i>GFP and Advanced Microscopy in Cell Biology</i> , Max Planck Institute, Goettingen, Germany

Postdoctoral and Student Research Supervised

Postdoctoral researchers:

Zhibo Zhen, Sept. 2018-present

Education: Ph.D. in Systems and Synthetic Biology, Peking University, China.

Ting-Huan Chen, March 2018-present

Education: Ph.D. in Biotechnology, National Tsing Hua University (NTHU), Taiwan.

Atefeh Rabiee, Feb 2017-present

Education: Ph.D. in Metabolism/Cell Biology, University of Copenhagen, Denmark

Brooks Taylor, March 2016-present

Education: B.S. in Bioengineering, University of Virginia, Charlottesville. VA
Ph.D. in Bioengineering, U.C. San Diego, San Diego, CA.

Ewa Bielczyk-Maczynska, Jan. 2016-present

Education: Ph.D. in Genetics, University of Cambridge, Cambridge, England.

Stefan Tholen, Oct. 2015-present

Education: Ph.D. University of Freiburg, Freiburg, Germany.

Devon Hunerdosse, 2015-2017

Main project: "Understanding the role of C/EBPB in mediating insulin resistance in adipose tissue"

Education: B.S. in Biology, Wartburg College, Waverly, Iowa.

Ph.D. in Endocrinology and Metabolism, UC Berkeley, Berkeley, CA.

Current position: Senior Research Biologist, 3M Corporation, Minnesota, MN.

Karen Tkach, 2014-2015

Main project: “Computational modeling and experiments to understand the link between hormonal oscillations and adipogenesis”

Education: B.S. in Molecular and Cell Biology, Immunology Emphasis.

q-Bio Summer School on Cellular Information Processing.

Ph.D. in Immunology, Weill Cornell Medical School, NY, NY.

Current position: Senior Scientific Writer, BioCentury Publications, Redwood City, CA.

Asuka Ota, 2011-2014

Main project: “Using targeted proteomics to identify novel regulators of insulin sensitivity.”

Education: B.S. in Microbiology, Immunology, and Molecular Genetics, UCLA.

Ph.D. in Molecular, Cellular, and Integrative Physiology, UCLA.

Current position: Senior Scientist, Emerald Therapeutics, South San Francisco, CA.

Robert Ahrends, 2010-2013

Main project: “Targeted proteomics to understand how to control low rates of cell differentiation”

Education: Diploma in Biology, U. of Giessen, Germany.

Ph.D. in Chemistry, Humboldt University, Berlin, Germany.

Current position: Independent Group Leader in Systems Biology, Leibniz Institute for Analytical Sciences, Dortmund, Germany.

Byung Ouk Park, 2009-2012

Main project: “Single-cell imaging approach to identify and dissect the bistable switch controlling preadipocyte to adipocyte conversion”.

Education: B.S. in Biochemistry, Gyeongsang National University, Korea.

Ph.D. in Molecular Biology and Biotechnology, Gyeongsang National University, Korea.

Current position: Senior Research Scientist, Institute for Basic Science, South Korea.

Kangbeom Kwan, 2009-2010

Main Project: “An siRNA screen to uncover regulators of adipogenesis”

Current Position: Associate Professor, Dept. of Physiology, Wonkwang University, South Korea.

Ph.D. students:**Joydeb Sinha, 2017-present**

Ph.D. Program in Chemical and Systems Biology

Main Project: “Understanding the relationship between circadian rhythms and adipogenesis”

Education: B.S. and M.S. in Cell Biology, U.C. San Diego, San Diego, CA.

Kyle Kovary, 2014-present

Ph.D. Program in Chemical and Systems Biology

Main Project: “Using selected reaction monitoring mass spectrometry to quantitate natural protein variation in single cells and infer protein-protein relationships in cell cycle regulation”

Education: B.S. in Biochemistry, U.C. Santa Cruz, Santa Cruz, CA.

Michael Zhao, 2013-present

Ph.D. Program in Chemical and Systems Biology

Main project: “Computational modeling and experiments to understand the link between the cell cycle and terminal cell differentiation”

Education: B.S. in Bioengineering, U.C. San Diego, San Diego, CA.

Zahra Bahrami-Nejad, 2013-2018

Ph.D. Program in Chemical and Systems Biology

Main project: "Understanding the dynamics of PPAR γ , CEBPA, and CEBPB in regulating adipogenesis"

Education: B.S. in Biology, University of Guilan, Rasht, Iran.

M.S. in Marine Biology, University of Guilan, Rasht, Iran.

M.S. in Biotechnology and Protein Science, Department of Biochemistry, University of Oulu, Oulu, Finland

Current position: Scientist at Amgen, South San Francisco, CA.

Masters students:**Anthony Wu, 2014-2016**

Main project: "Developing an automated hormonal oscillation device for mammalian cells"

Education: B.S. in Mechanical Engineering, Taiwan University.

Sabine van Schie, 2015-2016

Main project: "Understanding the mechanisms controlling chromatin opening and closing required to transition from the precursor to terminally differentiated state in adipogenesis."

Education: B.S. and M.S. in Biotechnology, University of Leiden, Leiden, Netherlands

Bamani Balaji, 2012-2013

Main project: "Using TALENS technology to control adipogenesis"

Education: B.S. in Chemical Engineering. Caltech, Pasadena. CA.

Undergraduate researchers:**Terrance Haanen, Cal State San Marcos, Summer 2018**

"Identifying the molecular target of Wisp2 on preadipocytes"

Mia Hutchinson, Stanford University, Summers 2014 and 2016

"Design and construction of a perfusion system to test oscillatory input to differentiating cells"

Current position: Masters student at Stanford University in Mechanical Engineering, Product Design.

Oliva Wu, Stanford University, 2013-2016

"Developing a live-cell sensor for terminal cell differentiation using TALENS technology"

Current position: Medical student at Stanford University

Nicole Dahal, Stanford University, 2013-2016

"Understanding the functional role of C/EBP β in insulin-resistant adipocytes"

Current position: Medical student, Duke University Medical School, Durham, NC

Alexander Platero, UC Davis, Summers 2013 and 2014

"Using targeted proteomics to identify and quantify novel cycling proteins on the single-cell level"

Current position: PhD student, Johns Hopkins University Neuroscience Program

Casey Haaland, Stanford University, Summer 2012

"Improving the efficiency of electrospray ionization for use in mass spectrometry"

Current position: Software engineer, Microsoft, Seattle, Washington.

Christopher Brunson, Stanford University, 2009–2012

"Speciation of proteins regulating adipogenesis"

Current position: Medical student, UC San Francisco, San Francisco, CA.

Bryce Aebi, Brown University, Summer 2011

"Developing a glucocorticoid receptor fluorescent reporter construct"

Current position: Software engineer, Yahoo, San Francisco, CA.

Michael Nguyen, Stanford University, Summer 2009

“Understanding ERK versus PI3K pathway regulation of adipogenesis”

Karen Li, Stanford University, 2007-2009

“Developing assays for monitoring lipid droplet formation in adipocytes”

Awards to Students/Postdoctoral Fellows Under Supervision:

1. Tinghuan Chen, 2018-2019, Stanford Dean’s Postdoctoral Fellowship
2. Ewa Bielczyk-Maczynska, 2018-2020, American Heart Association Postdoctoral Fellowship (received a 1.75% score)
3. Michael Zhao, 2017-2019, NIH F31 Postdoctoral Fellowship (received top 1% score)
4. Brooks Taylor, 2017-2019, NIH F32 Postdoctoral Fellowship (received top 1% score)
5. Atefeh Rabiee, 2017-2021, Novo-Nordisk 4-year Visiting Scholar Fellowship
6. Ewa Bielczyk-Maczynska, 2016-2017, Stanford Dean’s Postdoctoral Fellowship
7. Brooks Taylor, 2016-2017, Stanford Jump Start Award for Excellence in Research Award
8. Brooks Taylor, 2016-2017, Stanford Endocrinology Training Grant T32 Postdoctoral Fellowship
9. Stefan Tholen, 2016-2019, German Science Foundation (DFG) Postdoctoral Fellowship
10. Devon Hunerdosse, 2016-2018, American Heart Association Postdoctoral Fellowship (received a 1.5% score, #3 out of 155 applicants)
11. Wenting Yang, 2014-2015, Stanford Dean’s Postdoctoral Fellowship
12. Mia Hutchinson, Summer 2014, Stanford University Bio-X Undergraduate Research Fellowship
13. Olivia Wu, Summer 2014, Stanford HEBREX Undergraduate Fellowship
14. Asuka Ota, July 2013, Travel Award to attend Kern Lipid Conference, Vail, CO.
15. Asuka Ota, 2013-2015, American Heart Association Postdoctoral Fellowship (received a 4.4% score, #8 out of 134 applicants)
16. Alexander Platero, November 2013, Travel award to attend and give oral presentation at ABRCMS Conference, Nashville, TN.
17. Alexander Platero, Summer 2013, Amgen Scholar
18. Nicole Dahal, Summer 2013, Stanford University Bio-X Undergraduate Research Fellowship
19. Asuka Ota, 2012-2013, Stanford Dean’s Postdoctoral Fellowship
20. Casey Haaland, Summer 2012, Stanford University Bio-X Undergraduate Research Fellowship
21. Christopher Brunson, Summer 2011, Stanford University Bio-X Undergraduate Research Fellowship
22. Robert Ahrends, 2011-2013, German Science Foundation (DFG) Postdoctoral Fellowship
23. Robert Ahrends, 2010-2011, Stanford Dean’s Postdoctoral Fellowship
24. Kangbeom Kwon, 2009-2010, International Fellowship from Wonkwang University, South Korea

Other Research Supervised

Kyle Kovary, 2011-2014

Life Sciences Research Assistant

Main project: “Developing SRM libraries to identify nuclear signatures of metabolic disease”

Next position: PhD student, Stanford Chemical and Systems Biology Graduate Program

Ellen Abell, 2009-2011

Life Sciences Research Assistant

Main project: "Parallel adaptive feedback enhances reliability of the Ca²⁺ signaling system"

Next position: Medical Student, Loma Linda University, Loma Linda, CA.

Service on Ph.D. Thesis Committees

Shawn Ouyang, Ph.D. in Chemical and Systems Biology, Lab of James Chen

Nicholas Ruggero, Ph.D. in Chemical Engineering, Lab of Markus Covert

Ong Qunxiang, Ph.D. in Chemistry, Lab of Bianxui Cui

Katie Solari, Ph.D. in Biology, Lab of Elizabeth Hadly

Nora Yucel, Ph.D. in Genetics, Lab of Helen Blau

Zach Brown, Ph.D. in Developmental Biology, Lab of Stuart Kim

Anjali Bisari, Ph.D. in Chemical and Systems Biology, Lab of Tobias Meyer

Leighton Daigh, Ph.D. in Chemical and Systems Biology, Lab of Tobias Meyer

Chelsea Kliebert, Ph.D. in Chemical and Systems Biology, Lab of Jennifer Cochran

Eva Yi-Hsuan Huang, Ph.D. in Chemical Engineering, Lab of Alex Dunn

Vinay Surya, Ph.D. in Chemical Engineering, Lab of Alex Dunn

Service on Postdoctoral Fellow Committees

Leslie Cruz, Ph.D., Lab of Daria Mochly-Rosen

Professional Affiliations

Member, American Society of Cell Biology

Member, Biomedical Engineering Society

Member, American Society of Mass Spectrometry

Member, US Human Proteome Organization

Service to the Department and the Institution

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|--------------|--|
| 2017-present | Instructor in the Stanford Grant Writing Academy Workshops to train postdoctoral fellows and graduate students how to write grants |
| 2016-present | Stanford Women and Sex Differences in Medicine (WSDM) Center Representative for the Departments of Chemical and Systems Biology and Bioengineering |
| 2014-present | Seminar Coordinator for the Department of Chemical and Systems Biology, responsible for organizing and hosting 10-12 Cutting Lectures each year given by internationally-recognized speakers |
| 2014-present | Member of the Stanford Neuroscience Microscopy Service Advisory Board |

- 2014-present Co-organizer (with Tobias Meyer and James Ferrell) of the Stanford Center of Systems Biology which provides \$100,000 in seed grants per year, funds 4 PhD students per year provides funding for 14 PI's at Stanford and UC Berkeley, and organizes weekly seminars and symposia on Systems Biology.
- September 2017 Served on Women in STEM Panel to advise incoming freshman women at Stanford on STEM opportunities and careers.
- June 2015 Represented the Stanford SPARK T32 Training Grant (T32 GM113854-27) at the NIGMS-sponsored Training, Workforce Development, and Diversity Program Directors' Meeting, Chantilly, VA.
- Winter 2013 Spearheaded, organized, and wrote the bulk of a successful NIH Shared Instrumentation S10 Grant for high-content confocal imaging system (PI: Tobias Meyer, awarded July 2014).
- Fall 2012 Spearheaded, organized, and wrote the bulk of a successful NIH P50 to start the Stanford Center for Systems Biology with 14 principal investigators from Stanford and UC Berkeley (awarded \$10.5 million over 5 years, PI: James Ferrell). The center started in Fall 2013 and focuses on understanding the Systems Biology of Collective Cell Decisions.
- 2011-2014 Member of the Stanford Dean's Fellowship Committee which reviews applications and awards 25 postdoctoral fellowships two times per year
- 2011-present Dept. of Chemical and Systems Biology Graduate Training Program Advisor
- 2011-2016 Stanford Undergraduate Pre-major Advisor to six science and engineering freshman each year

Service to the Profession

Editorial Service

Reviewer for *Science*, *Cell Metabolism*, *Cell Systems*, *Molecular Systems Biology*, *Nature Biotechnology*, *Nature Structural Biology*, *Stem Cell Reports*

Grant Reviews

- 2015-present Grant reviewer for the Swiss National Science Foundation
- April 2015 American Heart Association Study Section on Lipoproteins-Lipid Metabolism & Nutrition, Basic Science
- March 2012 Program Review of the UCLA Department of Molecular and Medical Pharmacology (27 primary faculty, 62 graduate students). Carried out at the request of the UCLA Academic Senate.
- March 2012 NIH Study Section on Fellowships in Chemistry, Biochemistry, Biophysics, and Bioengineering
- June 2011 NIH Study Section on Cell, Molecular, and Computational Biology
- February 2007 NIH Study Section on Microscopy and Imaging
- March 2006 NIH Study Section on Microscopy and Imaging

November 2002 NCI Study Section: Innovative Technologies for the Molecular Analysis of Cancer
National Cancer Institute

Professional Development

- April-May 2016 Participated in the 2016 Stanford Medicine Teaching and Mentoring Academy's Teaching Skills Workshop for Junior Faculty, which consisted of 4 x 2 hour sessions (8 hours total) designed to give participants with practical tools for enhancing their teaching effectiveness.
- August 2015 Participated in the 5-day 2015 Faculty Course Design Institute, an intensive 5-day workshop (40 hours total) led by the Stanford Center for Teaching and Learning. The goal of the workshop was to learn how to design a course, with the goal of optimizing student engagement and learning.