

# SCOTT BANTA, PHD

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## EDUCATION

*Rutgers, The State University of New Jersey* PhD 2002  
Department of Chemical and Biochemical Engineering MS 2000

- Advisor: Stephen Anderson, PhD (Department of Molecular Biology and Biochemistry)
- NIH pre-doctoral Biotechnology Training Program, 4.0 GPA

*University of Maryland, Baltimore County* BSE 1997  
Department of Chemical and Biochemical Engineering

- Graduation with Honors, Minors in Mathematics and Physics

## POSTDOCTORAL TRAINING

*Harvard Medical School* 2002-2004  
Center for Engineering in Medicine, Shriners and Massachusetts General Hospitals

- Advisor: Martin Yarmush, MD, PhD

## ACADEMIC APPOINTMENTS

*Columbia University*

Professor, Department of Chemical Engineering 2015-present  
Associate Professor, Department of Chemical Engineering 2009-2015  
Assistant Professor, Department of Chemical Engineering 2004-2009

## TEACHING EXPERIENCE

*Columbia University*

- CHEN 6543 Chemical Engineering Research Methodology Fall 2015
- CHEN 4002 Essentials of Chemical Engineering B (Separations Module) Fall 2013-15
- CHEN 4230 Reactor Kinetics/Reactor Design Spring 2012-16
- CHEN 9000 Chemical Engineering Colloquium Spring 2009-11, Fall 2009-10, 2012
- CHEN 4800 Protein Engineering Fall 2005-06, 2012-15, Spring 2008, 2010
- CHEN 3810 Chemical Engineering Laboratory Spring 2005-09, 2011-12
- CHEN 4140 Chemical and Biochemical Engineering Separations Fall 2004-10, 2013

*Rutgers, The State University of New Jersey*

- 155:492 Protein Engineering Spring 2001

## AWARDS AND HONORS

- Fellow, American Institute for Medical and Biological Engineering (AIMBE), 2016
- James M. Van Lanen Distinguished Service Award, Biochemical Technology (BIOT) Division of the American Chemical Society, 2016
- James D. Watson Investigator Program Award, New York State Office of Science, Technology and Academic Research (NYSTAR), 2005

- Martin L. Yarmush Award for Excellence in Biotech Research Poster Award, 2001
- Dissertation Teaching Award, Rutgers, 2000
- Graduate Student Excellence Award, Rutgers, 1999
- First Place Student Poster Award: Food, Pharmaceuticals, Bioengineering. and Fundamentals in Life Sciences, AIChE Miami FL, 1998
- Outstanding Senior in Chemical and Biochemical Engineering, UMBC, 1997

## PEER REVIEWED PUBLICATIONS (68 TOTAL)

### (COLUMBIA UNIVERSITY PUBLISHED, 56 TOTAL)

- Wheeldon, I.R., Minter, S.D., **Banta, S.**, Calabrese Barton, S., Atanassov, P., and Sigman, M. (2016) "Substrate channeling as an approach to cascade reactions" *Nature Chemistry* (In Press)
- Hjelm, R., Garcia, E., Babanova, S., Artyushkova, K., **Banta, S.** and Atanassov, P. (2016) "Functional Interfaces for Biomimetic Energy Harvesting: CNTs-DNA Matrix for Enzyme Assembly" *Biophysica et Biochimica Acta (Bioenergetics)* (Special Issue: Biodesign for Bioenergy) (In Press).
- Li, X., West, A.C., and **Banta, S.** (2016) "Enhancing isobutyric acid production from engineered *Acidithiobacillus ferrooxidans* cells via media optimization" *Biotechnology and Bioengineering* (In Press).
- Ozbakir, H.F., Sambade, D.A., Majumdar, S., Linday, L., **Banta, S.**, and West, A.C. (2016) "Detection of 2,5-hydroxyvitamin D with an enzyme modified electrode" *Journal of Biosensors and Bioelectronics* 7(1) 193.
- Kernan, T., Majumdar, S., Li, X., Guan, J., West, A.C., and **Banta, S.** (2016) "Engineering the iron-oxidizing chemolithoautotroph *Acidithiobacillus ferrooxidans* for biochemical production" *Biotechnology and Bioengineering* 113(1) 189-197 (**Featured in B&B Editor's Spotlight Section - Ironic Biochemicals**).
- Lau, C., Moehlenbrock, M.J., Arechederra, R.L., Falase, A., Garcia, K., Rincon, R., Minter, S.D., **Banta, S.**, Gupta, G., Babanova, S. and Atanassov, P. (2015) "Paper based biofuel cells: Incorporating enzymatic cascades for ethanol and methanol oxidation" *International Journal of Hydrogen Energy* 40(42) 14661-14666.
- Smith, J.R., Amaya, K.R., Bredemeier, R.T., **Banta, S.**, and Cropek, D.M. (2015) "Selective biomolecular photocatalytic decomposition using peptide-modified TiO<sub>2</sub> nanoparticles" *Applied Catalysis B: Environmental* 176 315-324.
- Patel, T.N., Park, A-H.A. and **Banta, S.** (2014) "Genetic manipulation of outer membrane permeability: Generating porous heterogeneous catalyst analogs in *Escherichia coli*" *ACS Synthetic Biology* 3(12) 848-854.
- Li, X., Mercado, R., Berlinger, S., **Banta, S.** and West, A.C. (2014) "Engineering *Acidithiobacillus ferrooxidans* growth media for enhanced electrochemical processing" *AIChE Journal* 60(12) 4008-4013.
- Dooley, K., Bulutoglu, B. and **Banta, S.** (2014) "Doubling the cross-linking interface of a rationally-designed beta roll peptide for calcium-dependent proteinaceous hydrogel formation" *Biomacromolecules* 15(10) 3617-3624.

- Li, X., Mercado, R., Kernan, T., West, A.C., and **Banta, S.** (2014) "Addition of citrate to *Acidithiobacillus ferrooxidans* cultures enables precipitate-free growth at elevated pH and reduces ferric inhibition" *Biotechnology and Bioengineering* **111**(10) 1940-1948.
- Patel, T.N., Park, A-H.A. and **Banta, S.** (2014) "Surface display of small peptides on *Escherichia coli* for enhanced calcite (CaCO<sub>3</sub>) precipitation rates" *Biopolymers (Peptide Science)* **102**(2) 191-196.
- Chandra, D., Sankalia, N., Arcibal, I., **Banta, S.**, Cropek, D., and Karande, P. (2014) "Design of affinity peptides from natural protein ligands: A study of the cardiac troponin complex" *Biopolymers (Peptide Science)* **102**(1) 97-106.
- Patel, T.N., Swanson, E.J., Park, A-H.A. and **Banta, S.** (2014) "An automated method for measuring the operational stability of biocatalysts with carbonic anhydrase activity" *Biochemical Engineering Journal* **82** 48-52.
- Banta, S.**, Dooley, K., and Shur, O. (2013) "Replacing antibodies: Engineering new binding proteins" *Annual Review of Biomedical Engineering* **15** 93-113.
- Patel, T.N., Park, A-H. A., and **Banta, S.** (2013) "Periplasmic expression of carbonic anhydrase in *Escherichia coli*: A whole-cell biocatalyst for CO<sub>2</sub> hydration" *Biotechnology and Bioengineering* **110**(7) 1865-1873.
- Shur, O., Dooley, K. Blenner, M., Baltimore, M., and **Banta, S.** (2013) "A designed, phase changing RTX-based peptide for efficient bioseparations" *BioTechniques* **54**(4) 197-206. **(Featured in BioSpotlight Section).**
- Liu, F., **Banta, S.**, and Chen, W. (2013) "Functional assembly of a multi-enzyme cascade on the surface-displayed trifunctional scaffold for enhanced NADH production" *Chemical Communications* **49**(36) 3766-3768.
- Campbell, E., Chuang, S., and **Banta, S.** (2013) "Modular exchange of substrate-binding loops alters both substrate and cofactor specificity in a member of the aldo-keto reductase superfamily" *Protein Engineering, Design and Selection* **26**(3) 181-186.
- Shur, O., and **Banta, S.** (2013) "Rearranging and concatenating a native RTX domain to understand sequence modularity" *Protein Engineering, Design and Selection* **26**(3) 171-180.
- Kim, Y.H., Campbell, E., Yu, J., Minter, S.D., and **Banta, S.** (2013) "Complete oxidation of methanol in biobattery devices using a hydrogel created from three modified dehydrogenases" *Angewandte Chemie International Edition* **52**(5) 1437-1440 **(Designated as a "Hot Paper" by the Editors) (Highlighted in Angewandte by Prof. Dr. Uwe Schroder in "Self-assembling enzyme networks -A new path towards multi-step bioelectrocatalytic systems")**.
- Sahin, A., Lin, W.-T., Khunjar, W.O., Chandran, K., **Banta, S.**, and West, A.C., (2013) "Electrochemical reduction of nitrite to ammonia for use in a bioreactor" *Journal of the Electrochemical Society* **160**(1) G19-G26.
- Khunjar, W.O., Sahin, A., West, A.C., Chandran, K., and **Banta, S.** (2012) "Biomass production from electricity using ammonia as an electron carrier in a reverse microbial fuel cell" *PLoS ONE* **7**(9) e44846.
- Felsovalyi, F., Patel, T., Mangiagalli, P., Kumar, S.K., and **Banta, S.** (2012) "Effect of thermal stability on protein adsorption to silica using homologous aldo-keto reductases" *Protein Science* **21**(8) 1113-1125 **(Featured in Journal Highlights Section).**

- Dooley, K., Kim, Y.H., Lu, H.D., Tu, R., and **Banta, S.** (2012) "Engineering of an Environmentally Responsive Beta Roll Peptide for Use as a Calcium-Dependent Cross-Linking Domain for Peptide Hydrogel Formation" *Biomacromolecules* **13**(6) 1758-1764.
- Campbell, E., Meredith, M., Minter, S.D., and **Banta, S.** (2012) "An Enzymatic biofuel cell utilizing a biomimetic cofactor" *Chemical Communications* **48**(13) 1898-1900.
- Holland, J.T., Lau, C., Brozik, S., Atanassov, P., and **Banta, S.**, (2011) "Engineering of glucose oxidase for direct electron transfer via site-specific gold nanoparticle conjugation" *Journal of the American Chemical Society* **133**(48) 19262-19265.
- Wu, J., Park, J.P., Dooley, K., Cropek, D.M., West, A.C. and **Banta, S.** (2011) "Rapid development of new protein biosensors utilizing peptides obtained via phage display" *PLoS ONE* **6**(10) e24948.
- Felsovalyi, F., Mangiagalli, P., Bureau, C., Kumar, S.K., and **Banta, S.** (2011) "Reversibility of the adsorption of lysozyme on silica" *Langmuir* **27**(19) 11873-11882.
- Glykys, D.J., Szilvay, G.R., Tortosa, P., Suarez Diez, M., Jaramillo, A., and **Banta, S.** (2011) "Pushing the limits of automatic computational protein design: computational design, expression, and characterization of a large synthetic protein based on a fungal laccase scaffold" *Systems and Synthetic Biology* **5**(1-2) 45-58.
- Sahin, A., Dooley, K., Cropek, D.M., West, A.C., and **Banta, S.** (2011) "A dual enzyme electrochemical assay for the detection of organophosphorus compounds using organophosphorus hydrolase and horseradish peroxidase" *Sensors and Actuators B: Chemical* **158**(1) 353-360.
- Kang, W.H., Simon, M.J., Gao, S., **Banta, S.**, and Morrison III, B. (2011) "Attenuation of astrocyte activation by TAT mediated-delivery of a peptide JNK inhibitor" *Journal of Neurotrauma* **28**(7) 1219-1228.
- Szilvay, G.R., Brocato, S., Ivnitski, D., Li, C., De La Iglesia, P., Lau, C., Chi, E., Werner-Washburne, M., **Banta, S.**, and Atanassov, P. (2011) "Engineering of a redox protein for DNA-directed assembly" *Chemical Communications* **47**(26) 7464-7466.
- Gao, S., Simon, M.J., Hue, C.D., Morrison III, B., and **Banta, S.** (2011) "An unusual cell penetrating peptide identified using a plasmid display-based functional selection platform" *ACS Chemical Biology* **6**(5) 484-491 (**Recommended by Faculty of 1000, Featured in Biotechniques News**).
- Shur, O., Wu, J., Cropek, D.M., and **Banta, S.** (2011) "Monitoring the conformational changes of an intrinsically disordered peptide using a quartz crystal microbalance" *Protein Science* **20**(5) 925-930.
- Simon, M.J., Kang, W.H., Gao, S., **Banta, S.**, and Morrison III, B. (2011) "TAT is not capable of transcellular delivery across an intact endothelial monolayer in vitro" *Annals of Biomedical Engineering* **39**(1) 394-401.
- Gao, S., Simon, M.J., Morrison III, B., and **Banta, S.** (2010) "A plasmid display platform for the selection of peptides exhibiting a functional cell-penetrating phenotype" *Biotechnology Progress* **26**(6) 1796-1800.
- Simon, M.J., Kang, W.H., Gao, S., **Banta, S.**, and Morrison III, B. (2010) "Increased delivery of TAT across an endothelial monolayer following ischemic injury" *Neuroscience Letters* **486**(1) 1-4.

- Campbell, E., Wheeldon, I.R., and **Banta, S.** (2010) "Broadening the cofactor specificity of a thermostable alcohol dehydrogenase using rational protein design introduces novel kinetic transient behavior" *Biotechnology and Bioengineering* **107**(5) 763-774.
- Wu, J., Cropek, D.M., West, A.C. and **Banta, S.** (2010) "Development of a troponin I biosensor using a peptide obtained through phage display" *Analytical Chemistry* **82**(19) 8235-8243.
- Banta, S.**, Wheeldon, I.R., and Blenner, M. (2010) "Protein engineering in the development of functional hydrogels" *Annual Review of Biomedical Engineering* **12** 176-186.
- Lu, H.D., Wheeldon, I.R., and **Banta, S.** (2010) "Catalytic biomaterials: Engineering organophosphate hydrolase to form self-assembling enzymatic hydrogels" *Protein Engineering, Design and Selection* **23**(7) 559-566.
- Blenner, M.A., Shur, O., Szilvay, G.R., Cropek, D.M., and **Banta, S.** (2010) "Calcium-induced folding of a beta roll motif requires C-terminal entropic stabilization" *Journal of Molecular Biology* **400**(2) 244-256.
- Park, J.P., Cropek, D.M., and **Banta, S.** (2010) "High affinity peptides for the recognition of the heart disease biomarker troponin I using phage display" *Biotechnology and Bioengineering* **105**(4) 678-686.
- Szilvay, G.R., Blenner, M.A., Shur, O., Cropek, D.M., and **Banta, S.** (2009) "A FRET-based method for probing the calcium-dependent conformational behavior of an intrinsically disordered beta roll domain from the *Bordetella pertussis* adenylate cyclase" *Biochemistry* **48**(47) 11273-11282.
- Wheeldon, I.R., Campbell, E. and **Banta, S.** (2009) "A chimeric fusion protein engineered with disparate functionalities – enzymatic activity and self assembly" *Journal of Molecular Biology* **392**(1) 129-142.
- Simon, M.J., Gao, S., Kang, W.H., **Banta, S.**, and Morrison III, B. (2009) "TAT-mediated intracellular protein delivery to primary brain cells is dependent on glycosaminoglycan expression" *Biotechnology and Bioengineering* **104**(1) 10-19.
- Chockalingam, K., Lu, H.D., and **Banta, S.** (2009) "Development of a bacteriophage-based system for the selection of short structured peptides" *Analytical Biochemistry* **388**(1) 122-127.
- Gao, S., Simon, M.J., Morrison III, B., and **Banta, S.** (2009) "Bifunctional chimeric fusion proteins engineered for DNA delivery: Optimization of the protein to DNA ratio" *Biochimica et Biophysica Acta (General Subjects)* **1790**(3) 198-207.
- Glykys, D.J., and **Banta, S.** (2009) "Metabolic control analysis of an enzymatic biofuel cell" *Biotechnology and Bioengineering* **102**(6) 1624-1635.
- Chen, X.J., West, A.C., Cropek, D.M., and **Banta, S.** (2008) "Detection of the superoxide radical anion using various alkanethiol monolayers and immobilized cytochrome c" *Analytical Chemistry* **80**(24) 9622-9629.
- Wheeldon, I.R., Gallaway, J.W., Calabrese Barton, S., and **Banta, S.** (2008) "Bioelectrocatalytic hydrogels from electron-conducting metallopolypeptides coassembled with bifunctional enzymatic building blocks" *Proceedings of the National Academy of Sciences of the United States of America* **105**(40) 15275-15280.
- Blenner M.A., and **Banta, S.** (2008) "Characterization of the 4D5Flu single chain antibody with a stimulus-responsive elastin-like peptide linker: A potential reporter of peptide linker conformation" *Protein Science* **17**(3) 527-536.

- Gallaway, J., Wheeldon, I.R., Rincon, R., Atanassov, P., **Banta, S.**, and Calabrese Barton, S. (2008) "Oxygen-Reducing Enzyme Cathodes Produced from SLAC, a Small Laccase from *Streptomyces coelicolor*, For Use at Neutral pH" *Biosensors and Bioelectronics* **23**(8) 1229-1235.
- Wheeldon, I.R., Calabrese Barton, S., and **Banta, S.** (2007) "Bioactive Proteinaceous Hydrogels from Designed Bi-functional Building Blocks" *Biomacromolecules* **8**(10) 2990-2994.
- Chockalingam, K., Blenner, M., and **Banta, S.** (2007) "Design and Application of Stimulus-Responsive Peptide Systems" *Protein Engineering, Design and Selection* **20**(4) 155-161.

### (HARVARD UNIVERSITY, 7 TOTAL)

- Casali, M., **Banta, S.**, Zambonelli, C., Megeed, Z., and Yarmush, M.L. (2008) "Site-directed mutagenesis of the hinge peptide from the Hemagglutinin protein: Enhancement of the pH-responsive conformational change" *Protein Engineering, Design and Selection* **21**(6) 395-404.
- Banta, S.\***, Megeed, Z.\*, Casali, M., Rege, K., and Yarmush, M.L. (2007) "Engineering Protein and Peptide Building Blocks for Nanotechnology" *Journal of Nanoscience and Nanotechnology* **7**(2) 387-401 (\*co-first authors).
- Banta, S.\***, Vemula, M.\*, Yokoyama, T., Jayaraman, A., Berthiaume, F., and Yarmush, M.L. (2007) "Contribution of Gene Expression to Metabolic Fluxes in Hypermetabolic Livers Induced Through Burn Injury and Cecal Ligation and Puncture in Rats" *Biotechnology and Bioengineering* **97**(1) 118-137 (\*co-first authors) (**Featured in Editor's Spotlight** ).
- Banta, S.**, Yokoyama, T., Berthiaume, F., and Yarmush, M.L. (2005) "Effects of Dehydroepiandrosterone administration on rat hepatic metabolism following thermal injury" *Journal of Surgical Research* **127**(2) 93-105.
- Yokoyama, T., **Banta, S.**, Berthiaume, F., Nagrath, D., Tompkins, R.G., and Yarmush, M.L. (2005) "Evolution of intrahepatic carbon, nitrogen, and energy metabolism in a D-galactosamine-induced rat liver failure model" *Metabolic Engineering* **7**(2) 88-103.
- Banta, S.**, Yokoyama, T., Berthiaume, F., and Yarmush, M.L. (2004) "Quantitative effects of thermal injury and insulin on the metabolism of the skeletal muscle using the perfused rat hindquarter preparation" *Biotechnology and Bioengineering* **88**(5) 613-629.
- Yarmush, M.L. and **Banta, S.** (2003) "Metabolic engineering: Advances in modeling and intervention in health and disease" *Annual Review of Biomedical Engineering* **5** 349-381.

### (RUTGERS UNIVERSITY, 5 TOTAL)

- Sanli, G., **Banta, S.**, Anderson, S., and Blaber, M. (2004) "Structural alteration of cofactor specificity in *Corynebacterium* 2,5-diketo-D-gluconic acid reductase" *Protein Science* **13**(2) 504-512.
- Banta, S.**, Boston, M., Jarnagin, A., and Anderson, S. (2002) "Mathematical modeling of *in vitro* enzymatic production of 2-keto-L-gulonic acid using NAD(H) or NADP(H) as cofactors" *Metabolic Engineering* **4**(4) 273-284.
- Banta, S.**, and Anderson, S. (2002) "Verification of a novel NADH-binding motif: Combinatorial mutagenesis of three amino acids in the cofactor binding pocket of *Corynebacterium* 2,5-diketo-D-gluconic acid reductase" *Journal of Molecular Evolution* **55**(6) 623-631.

**Banta, S.**, Swanson, B.A., Wu, S., Jarnagin, A., and Anderson, S. (2002) "Optimizing an artificial metabolic pathway: Engineering the cofactor specificity of *Corynebacterium* 2,5-diketo-D-gluconic acid reductase for use in vitamin C biosynthesis" *Biochemistry* **41**(20) 6226-6236.

**Banta, S.**, Swanson, B.A., Wu, S., Jarnagin, A., and Anderson, S. (2002) "Alteration of the specificity of the cofactor-binding pocket of *Corynebacterium* 2,5-diketo-D-gluconic acid reductase A" *Protein Engineering* **15**(2) 131-140. (**Featured on cover**)

## BOOK CHAPTERS AND OTHER ARTICLES

Campbell, E., and **Banta, S.** (2014) "Protein Engineering for Enzymatic Fuel Cells" *Enzymatic Fuel Cells: From Fundamentals to Applications* Edited by H.R. Luckariff, P.B. Atanassov and G.R. Johnson, Wiley & Sons.

Atanassov, P., Apblett, C., **Banta, S.** Brozik, S., Calabrese Barton, S., Cooney, M., Liaw, B. Y., Mukerjee, S., and Minter, S.D. (2007) "Enzymatic Biofuel Cells" *Interface* **16**(2) 28-31

**Banta, S.** (2006) "Protein Engineering" *The Biomedical Engineering Handbook, 3rd Ed*, Edited by J.D. Bronzino, CRC Press, Boca Raton, Florida.

**Banta, S.** and Zupke, C. (2006) "Metabolic Engineering" *The Biomedical Engineering Handbook, 3rd Ed*, Edited by J.D. Bronzino, CRC Press, Boca Raton, Florida.

## PATENTS

**Banta, S.**, West, A.C., and Kernan, T. "Methods and Systems for Producing Products Using Engineered Sulfur Oxidizing Bacteria" Application Number 20150031084, U.S. Patent Pending

**Banta, S.**, and Shur, O. "Precipitable peptides" Application Number 20140187746, U.S. Patent Pending

**Banta, S.** and West, A.C. "Methods and Systems for Producing Products Using Engineered Iron Oxidizing Bacteria" Application Number 20140335583, U.S. Patent Pending

**Banta, S.**, Chandran, K., and West, A.C. "Methods and Systems for Producing Products Using Engineered Ammonia Oxidizing Bacteria" Application number 20130052689, U.S. Patent Pending

**Banta, S.**, Blenner, M.A., Wheeldon, I., and Dooley, K. "Leucine Beta Roll Domains and Uses Thereof" (2015) U.S. Patent Number 9,127,267.

**Banta, S.**, Calabrese-Barton, S., and Wheeldon, I. "Self-assembling protein hydrogel with bio-active protein" (2013) U.S. Patent Number 8,415,290.

Anderson, S. and **Banta, S.** "Design and production of mutant 2,5-diketo-D-gluconic acid reductase enzymes with altered cofactor dependency" (2002) U.S. Patent Number 6,423,518.

## INVITED RESEARCH SEMINARS

**Banta, S.** "Engineering *Acidithiobacillus ferrooxidans* cells for biochemical production using electricity and CO<sub>2</sub>" Invited Research Seminar, Virginia Tech, Blacksburg, VA Nov. 2015

**Banta, S.** "Engineering a thermostable alcohol dehydrogenase for biofuel cells and biosensors" Key-note Talk, 3<sup>rd</sup> European Congress of Applied Biotechnology (ECAB3), Nice, France, Sept 2015.

- Banta, S.** "Engineering of the small laccase (SLAC) from for incorporation into bioelectrochemical systems" Soft Nano Symposium, Nanoscience Initiative of The CUNY Advanced Science Research Center (ASRC), New York, NY, Jun. 2015
- Banta, S.** "Engineering the Beta Roll peptide to participate in useful biomolecular interactions" Invited Research Seminar, Rensselaer Polytechnic Institute, Troy NY, Feb. 2015
- Banta, S.** "Engineering the Protein/Nanomaterial Interface for Biosensors and Biofuel Cells" Invited Plenary Talk, American Institute of Chemical Engineers Annual Meeting, Atlanta, GA Nov. 2014
- Banta, S.** "Engineering the Beta Roll peptide to participate in useful biomolecular interactions" Invited Research Seminar, Georgia Tech, Atlanta, GA Oct. 2014
- Banta, S.** "A designed calcium-responsive peptide domain for non-chromatographic protein purification", The Bioprocessing Summit, Boston MA, Aug. 2014
- Banta, S.** "Adventures in the start-up of an electrofuels company" Rutgers University Biotechnology Training Program Annual Mini-Symposium, Piscataway, NJ, June 2014
- Banta, S.** "Development of a directed evolution strategy to identify cell penetrating peptides (CPPs) for brain delivery", Biologics Formulation and Delivery Summit, Boston MA, May 2014
- Banta, S.** "Engineering the Beta Roll peptide to participate in useful biomolecular interactions" Invited Research Seminar, University of Virginia, Charlottesville, VA Dec. 2013
- Banta, S.** "Exploiting Peptide Conformational Changes for Protein Purification" Invited Keynote Presentation, The 2013 Biotechniques Virtual Symposium - Exploring The Modern Lab, Oct. 2013
- Banta, S.** "Protein Engineering for Bioelectrocatalysis: We can do more than just Vmax" Invited talk, Indo-US Workshop on Electrocatalytic Materials for Fuel and Biofuel Cells, Banaras Hindu University, Varanasi, India, Feb 2013
- Banta, S.** "Engineering the Beta Roll peptide to participate in useful biomolecular interactions" Invited Research Seminar, Princeton University, Princeton, NJ Dec. 2012
- Banta, S.** "Engineering Enzymes to Self-Assemble into Catalytic Biomaterials", Ten-Year Anniversary Symposium, Institute for Biotechnology, St. John's University, Queens, NY May 2012
- Banta, S., West, A.C., and Chandran, K.** "Electrofuel Production using Ammonia or Iron as Redox Mediators in Reverse Microbial Fuel Cells" Chemical Engineering Discussion Group, New York Academy of Sciences, New York, NY, Mar. 2012
- Banta, S.** "Selection of Novel Cell Penetrating Peptides Using Plasmid Display", Roche, Nutley, NJ, Jan 2012
- Banta, S.** "Protein and Metabolic Engineering Laboratory" Life Science Summit, New York, NY, Nov 2011
- Banta, S., West, A.C., and Chandran, K.** "Electrofuel Production using Ammonia or Iron as Redox Mediators in Reverse Microbial Fuel Cells" Society for Biological Engineering's Conference on Electrofuels Research, Providence, RI, Nov. 2011
- Banta, S.** "Protein Engineering for Biosensors and Biofuel Cells" Invited research seminar, Yale University, New Haven CT, Nov. 2011
- Banta, S.** "Development of the Beta Roll Motif as a Novel Biomolecular Recognition Scaffold" Invited research seminar, 25<sup>th</sup> Anniversary Center for Advanced Biotechnology and Medicine Symposium, Rutgers University, Piscataway, NJ, Oct. 2011



- Banta, S.** "Electrofuels" Invited research seminar, 2011 Biofuels Conference, Mississippi State University, Starkville, MS, Oct 2011
- Banta, S.** "The Beta Roll Motif as a Novel Scaffold for Engineering Biomolecular Recognition" Invited research seminar, Department of Chemistry, Biochemistry Seminar, City College of CUNY, New York, NY, Sept. 2011
- Banta, S.** "A Plasmid Display System for the Identification of New Functional Cell Penetrating Peptides" Invited research seminar, 4th Annual Symposium on Integrating Nanotechnology with Cell Biology and Neuroscience, University of New Mexico, Albuquerque, NM, Aug. 2011
- Banta, S., West, A.C., and Chandran, K.** "Biofuels from CO<sub>2</sub> using Ammonia-Oxidizing Bacteria in a Reverse Microbial Fuel Cell" ARPA-E Annual Energy Innovation Summit, Washington D.C., Mar. 2011
- Banta, S.** "Protein Engineering for Biosensors and Biofuel Cells" Invited research seminar, University of Minnesota, Minneapolis MN, Dec. 2010
- Banta, S.** "Selection of Novel Cell Penetrating Peptides Using Plasmid Display" Invited presentation, Biological Design: 4<sup>th</sup> Annual Advances in Biomolecular Engineering Symposium, The New York Academy of Sciences, New York, NY, Dec. 2010
- Banta, S.** "Protein Engineering for Biosensors and Biofuel Cells" Invited research seminar, Rutgers University, Piscataway NJ, Nov. 2010
- Banta, S.** "Protein Engineering for Biosensors and Biofuel Cells" Invited research seminar, Ohio State University, Columbus OH, Oct. 2010
- Banta, S.** "Protein Engineering for Biosensors and Biofuel Cells" Invited research seminar, NYU Poly, Brooklyn, NY, Oct. 2010
- Banta, S.** "Protein Engineering for Biosensors and Biofuel Cells" Invited research seminar, Arizona State University, Tempe AZ, Sept. 2010
- Banta, S.** "Protein Engineering for Improved Electron Transfer in Bioelectrocatalysis Applications" Invited talk, BIO World Congress on Industrial Biotechnology and Bioprocessing, Washington, DC, June 2010
- Banta, S.** "Engineering Enzymes to Self-Assemble into Catalytic Biomaterials" Invited talk, ARO/ARL sponsored Bio-Directed Assembly Workshop, Keystone, CO, May 2010
- Banta, S.** "Protein Engineering for Bioelectrocatalysis: We can do more than just V<sub>max</sub>" Invited keynote talk, Electrochemical Society Meeting, Vancouver, BC, CA, Apr 2010
- Banta, S.** "Protein Engineering for Biosensors and Biofuel Cells" Invited research seminar, Michigan State University, East Lansing MI, Feb 2010
- Banta, S.** "Protein Engineering for Biosensors and Biofuel Cells" Invited research seminar, University of New Mexico, Albuquerque NM, May 2009
- Banta, S.** "Self-Assembling Enzymatic Hydrogels from Designed Bifunctional Building Blocks" Invited research seminar, University of Medicine and Dentistry of New Jersey, Piscataway NJ, Sept. 2008
- Gao, S., Simon, M., Morrison III, B., and **Banta, S.** "Directed Evolution of Cell Penetrating Peptides for Delivery Across the Blood Brain Barrier to Specific Cellular Targets" Invited research seminar, Wyeth Pharmaceuticals, Princeton, NJ, May 2008
- Banta, S.** "Engineering of Stimulus-Responsive Peptides and their Application to Bioelectrocatalysis and Biosensing" Invited research seminar, University of Tennessee, Knoxville TN, Sept. 2007

- Banta, S.** "Peptide Engineering: Applications in Nanotechnology, Bioelectrocatalysis and Drug Delivery" Invited research seminar, Ecole Polytechnique, Paris, France, Jun. 2007
- Banta, S.** "Peptide Engineering: Applications in Nanotechnology, Bioelectrocatalysis, and Drug Delivery" Invited research seminar, University of Wyoming, Laramie WY, Mar. 2007
- Banta, S.** "Engineering of Stimulus-Responsive Peptides and their Application to Bioelectrocatalysis and Biosensing" Invited research seminar, Colorado State University, Ft. Collins CO, Mar. 2007
- Banta, S.** "Directed Evolution of Peptides: Applications in Nanotechnology and Bioelectrocatalysis" Invited research seminar, Rensselaer Polytechnic Institute, Troy NY, Aug. 2006
- Banta, S.** "Applications of Protein Engineering and Metabolic Engineering: Vitamin C, Hepatic Metabolism, and Biofuel Cells" Invited research seminar, Sandia National Labs and The University of New Mexico, Albuquerque NM, Sept. 2005.
- Banta, S.** "Applications of Protein and Metabolic Engineering to Health and Disease" Invited research seminar, Northeastern University, Boston, MA, Feb. 2004
- Banta, S.** "Applications of Protein and Metabolic Engineering to Health and Disease" Invited research seminar, Drexel University, Philadelphia, PA, Jan. 2004
- Banta, S.** "Applications of Protein and Metabolic Engineering to Health and Disease" Invited research seminar, Columbia University, New York, NY, Jan. 2004
- Banta, S.** "Applications of Protein and Metabolic Engineering to Health and Disease" Invited research seminar, University of Maryland, Baltimore County, Baltimore, MD, Dec. 2003
- Banta, S.** "Applications of Protein and Metabolic Engineering to Health and Disease" Invited research seminar, Rutgers University, Piscataway, NJ, Nov. 2003
- Banta, S.** "Engineering the cofactor specificity of *Corynebacterium* 2,5-diketo-D-gluconic acid reductase for use in vitamin C biosynthesis" Invited research seminar, Center for Engineering in Medicine, Harvard Medical School, Boston, MA, Oct. 2001
- Banta, S.** "Engineering the cofactor specificity of *Corynebacterium* 2,5-diketo-D-gluconic acid reductase for use in vitamin C biosynthesis" Invited research seminar, National Cancer Institute, National Institutes of Health, Bethesda, MD, Oct. 2001

### **SELECTED OTHER PRESENTATIONS (2004-PRESENT)**

- Banta, S.** (speaker). Garcia, K., Sheffler, W., Baker, D., Babanova, S., Hjelm, R. and Atanassov, P. "Engineering the small laccase (SLAC) from for incorporation into enzymatic biofuel cell cathodes" Pacific Chem, Honolulu, HI Dec. 2015
- Bulutoglu, B. (speaker), Dooley, K., and **Banta, S.** "Engineering the  $\beta$ -roll Peptide for Biotechnology Applications" AIChE Annual Meeting, Salt Lake City, UT Nov. 2015
- Banta, S.** (speaker) "Fuels from the wind or rocks: Engineering the iron-oxidizing chemolithoautotroph *Acidithiobacillus ferrooxidans* for biochemical production" Biochemical and Molecular Engineering XIX, Puerto Vallarta, Mexico, Jul 2015
- Banta, S.** (speaker) and West, A.C. "Engineering the chemolithoautotroph *Acidithiobacillus ferrooxidans* for chemical and fuel production" National Meeting of the American Chemical Society, Denver, CO, Mar. 2015
- West, A.C. (speaker) and **Banta, S.** "Production of Chemicals from Dilute CO<sub>2</sub> and Electricity" National Meeting of the American Chemical Society, Denver, CO, Mar. 2015

- Bulutoglu, B. (speaker), Garcia, K.E., Wu, F., Minter, S.D., and **Banta, S.** "Engineering and Characterization of Artificial Metabolons from the TCA Cycle" AIChE Annual Meeting, Atlanta, GA, Nov. 2014
- Garcia, K.E. (speaker), Bulutoglu, B., Hjelm, R., Babanova, S., Sheffler, W., Baker, D., Atanassov, P., and **Banta, S.** "Design of Self-Assembling Biocomplexes for Bio/Nano-Device Integration" AIChE Annual Meeting, Atlanta, GA, Nov. 2014
- Li, X. (speaker), Majumdar, S., Kernan, T., Mercado, R., West, A.C., and **Banta, S.** "Engineering of *Acidithiobacillus ferrooxidans* for Application in a Novel Non-Photosynthetic Electrofuel Production Platform" AIChE Annual Meeting, Atlanta, GA, Nov. 2014
- Ozbakir, H. (speaker), Sambade, D., Majumdar, S., **Banta, S.**, and West, A.C. "Towards the Development of an Electrochemical Biosensor for the Detection of Vitamin D" AIChE Annual Meeting, Atlanta, GA, Nov. 2014
- Banta, S.** (speaker) and West, A.C. "Electrofuel production using genetically engineered *Acidithiobacillus ferrooxidans* cells and iron as a redox mediator" Electrochemical Society Meeting, Cancun, Mexico Oct. 2014
- Banta, S.** (speaker). Garcia, K., Sheffler, W., Baker, D., Babanova, S., and Atanassov, P. "Adventures in the engineering of the small laccase (SLAC) from for incorporation into enzymatic biofuel cell cathodes" Electrochemical Society Meeting, Cancun, Mexico Oct. 2014
- Dooley K., Bulutoglu, B. and **Banta, S.** (speaker) "Engineering of Functional Proteinaceous Hydrogels for Biotechnology Applications" Northeast BioEngineering Conference, Boston, MA, Apr. 2014
- Banta, S.** (speaker) Li, X., Majumdar, S., Kernan, T., Mercado, R., and West, A.C. "Engineering *Acidithiobacillus ferrooxidans* for electrofuel production" National Meeting of the American Chemical Society, Dallas, TX, Mar. 2014
- Banta, S.** (speaker), Dooley K., Bulutoglu, B., and Tu, R. "Development of Functional Proteinaceous Hydrogels for Biotechnology Applications" AIChE Annual Meeting, San Francisco, CA, Nov. 2013
- Patel, T.N. (speaker), Swanson, E.J., Park, A-H.A., and **Banta, S.** "Whole-cell Biocatalysts for CO<sub>2</sub> Hydration" National Meeting of the American Chemical Society, New Orleans, LA, Apr. 2013
- Majumdar, S., (speaker) Kernan, T., Li, X., Mercado, R., West, A.C., and **Banta, S.** "Conversion of electrical energy to isobutanol using chemolithoautotrophic iron oxidizing bacteria *Acidithiobacillus ferrooxidans*, New Orleans, LA, Apr. 2013
- Dooley, K. (speaker) and **Banta, S.** "Engineering the repeats-in-toxin (RTX) domain for molecular recognition" National Meeting of the American Chemical Society, New Orleans, LA, Apr. 2013
- Banta, S.** (speaker), Alan C. West, Kartik Chandran, Wendell Khunjar, Asli Sahin, and Timothy Kernan "Electrofuel" Production Using Ammonia or Iron as Redox Mediators in Reverse Microbial Fuel Cells" Electrochemical Society Meeting, Seattle, WA May 2012
- Banta, S.** (speaker) and West, A. "Electricity to Biofuels and Chemicals in Reverse Microbial Fuel Cells" University Research and Entrepreneurship Symposium, Boston, MA, Apr 2012
- Felsovalyi, F. (speaker), Tushar, P., Mangiagalli, P., Kumar, S. and **Banta, S.** "Assessing the impact of thermal stability on protein adsorption behavior using naturally occurring

- enzymes of the aldo-keto reductase superfamily” National Meeting of the American Chemical Society, San Diego, CA, Mar. 2012
- Kernan, T. (speaker), Sahin, A., West, A. and **Banta, S.** “Electrofuel production using chemolithoautotrophic iron oxidizing bacteria in a reverse microbial fuel cell” National Meeting of the American Chemical Society, San Diego, CA, Mar. 2012
- Felsovalyi, F. (speaker), Mangiagalli, P., Kumar, S. and **Banta, S.** “What determines protein desorption behavior?” National Meeting of the American Chemical Society, San Diego, CA, Mar. 2012
- Dooley, K. (speaker), Tu, R., and **Banta, S.** “Development of an engineered beta roll motif for the creation of stimulus-responsive proteinaceous hydrogels” National Meeting of the American Chemical Society, San Diego, CA, Mar. 2012
- Shur, O. (speaker), Blenner, M., and **Banta, S.** “Development of a calcium-responsive beta roll peptide as a purification tag for non-chromatographic recombinant protein purification” National Meeting of the American Chemical Society, San Diego, CA, Mar. 2012
- Patel, T. (speaker), Swanson, E., Park, A-H A., and **Banta, S.** “Development of a whole-cell biocatalyst for permanent carbon capture and storage: Immobilization of carbonic anhydrase in the periplasmic space of E. coli” National Meeting of the American Chemical Society, San Diego, CA, Mar. 2012
- Campbell, E. (speaker), Meredith, M., Minter, S.D., **Banta, S.** “Engineering a thermostable dehydrogenase to utilize biomimetic cofactors to improve enzymatic biofuel cell performance” National Meeting of the American Chemical Society, Anaheim, CA, Mar. 2011
- Kim, Y.H., and **Banta, S.** (speaker), “Development of self-assembling enzymatic biomaterials for methanol oxidation to carbon dioxide in a biofuel cell” National Meeting of the American Chemical Society, Anaheim, CA, Mar. 2011
- Shur, O. (speaker), Szilvay, G.R., Blenner, M.A., Cropek, D.M., and **Banta, S.** “Beta roll motifs as a novel scaffold for engineering biomolecular recognition” National Meeting of the American Chemical Society, Anaheim, CA, Mar. 2011
- Sahin, A. (speaker), Khunjar, W.O., Chandran, K., West, A.C., and **Banta, S.** “Biofuels from CO<sub>2</sub> using ammonia-oxidizing bacteria in a reverse microbial fuel cell” National Meeting of the American Chemical Society, Anaheim, CA, Mar. 2011
- Gao, S., Simon, M.J., Morrison III, B., and **Banta, S.** (speaker) “A Plasmid Display Platform for the Identification of New Functional Cell Penetrating Peptides” Society for Biological Engineering, 3<sup>rd</sup> International Conference on Biomolecular Engineering, San Francisco CA, Jan. 2011.
- Shur, O. (speaker), Szilvay, G., Blenner, M.A., Cropek, D.M. and **Banta S.** “Directed Evolution of the Intrinsically Disordered and Allosterically Regulated Beta Roll Subdomain for Biomolecular Recognition” AIChE Annual Meeting, Salt Lake City, UT, Nov. 2010
- Felsovalyi, F. (speaker), Mangiagalli, P., Bureau, C., Kumar, S.K, and **Banta S.** “Evaluating the Role of Solid Surfaces in Inducing Conformational Changes of Adsorbed and Desorbed Proteins” AIChE Annual Meeting, Salt Lake City, UT, Nov. 2010
- Campbell, E. (speaker) and **Banta S.** “Protein Engineering of a Thermostable Alcohol Dehydrogenase to Improve Activity with Biomimetic Cofactors and Alternate Substrates” AIChE Annual Meeting, Salt Lake City, UT, Nov. 2010

- Wu, J., Cropek, D.M. (speaker), West, A.C., and **Banta S.** "Quartz Crystal Balance (QCM) and Electrochemical Impedance Detection of the Protein Biomarker Troponin I Using Peptides Obtained From the Biopanning of a Phage-Display Library" AICHE Annual Meeting, Salt Lake City, UT, Nov. 2010
- Sahin, A. (speaker), Cropek, D.M. West, A.C., and **Banta S.** "Dual Enzyme Biosensor for Detection of Organophosphorus Compounds Using Organophosphorus Hydrolase and Horseradish Peroxidase" AICHE Annual Meeting, Salt Lake City, UT, Nov. 2010
- Shur, O. (speaker), Szilvay, G., Blenner, M.A., Cropek, D.M. and **Banta S.** "Structure/Function Analysis for the Optimization of the Beta Roll Motif as a Novel Scaffold for Engineering Biomolecular Recognition " AICHE Annual Meeting, Salt Lake City, UT, Nov. 2010
- Wilson, R. (speaker), Cropek, D.M. and **Banta S.** "On Chip Electrochemical Detection of Biomarkers for Detection of Water Borne Toxins" AICHE Annual Meeting, Salt Lake City, UT, Nov. 2010
- Szilvay, G.R., Li, C., Brocato, S., Lau, C., Ivnitski, D., Chi, E., Atanassov, P., and **Banta, S.** (speaker) "A Laccase Protein Engineered for Site-Specific Immobilization on Carbon Nanotube Modified Electrodes " National Meeting of the American Chemical Society, San Francisco, CA, Mar. 2010
- Sahin, A. (speaker), Lu, H.D., Wheeldon, I.R., West, A.C., and **Banta, S.** "Engineering Organophosphatase Hydrolase to Self-Assemble into Hydrogels for Use in Sensing and Decontamination Applications" National Meeting of the American Chemical Society, San Francisco, CA, Mar. 2010
- Campbell, E. (speaker) and **Banta, S.** "Protein Engineering of a Thermostable Alcohol Dehydrogenase: Rational Alteration of Substrate Specificity and Development of a Novel Selection System for Directed Evolution" National Meeting of the American Chemical Society, San Francisco, CA, Mar. 2010
- Banta, S.** (speaker) and Cropek, D.M. "Beta Roll Peptide Structures for Allosterically Controlled Biomolecular Recognition and Decontamination" Chemical and Biological Defense Science and Technology Conference, Dallas, TX, Nov. 2009
- Park, J.P., Wu, J., West, A.C., Cropek, D.M., and **Banta, S.** (speaker) "Identification of Troponin I Binding Peptides Using Phage Display for Biosensor Development" AICHE Annual Meeting, Nashville, TN, Nov. 2009
- Campbell, E. (speaker), Wheeldon, I.R., and **Banta, S.** "Cofactor Engineering of a Thermostable Aldo-Keto Reductase Enzyme: Altering Cofactor Specificity and Development of a Novel Directed Evolution Selection Platform" AICHE Annual Meeting, Nashville, TN, Nov. 2009
- Shur, O. (speaker), Blenner, M.A., Szilvay, G.R., Cropek, D.M., and **Banta, S.** "Directed Evolution of Allosterically Regulated Beta Roll Subdomains for Biomolecular Recognition" AICHE Annual Meeting, Nashville, TN, Nov. 2009
- Blenner, M.A., Szilvay, G.R., Shur, O. (speaker), Cropek, D.M., and **Banta, S.** "Engineering Tools for Analysis of Intrinsically Disordered Proteins: Entropic Stabilization Enables a Type I Secretion Calcium Switch" AICHE Annual Meeting, Nashville, TN, Nov. 2009
- Gao, S. (speaker) Simon, M.J., Morrison III, B., and **Banta, S.** "Directed Evolution of Novel Cell Penetrating Peptides for Delivery to the Brain" AICHE Annual Meeting, Nashville, TN, Nov. 2009

- Wilson, R. (speaker), Cropek, D.M. and **Banta S.** "On Chip Electrochemical Detection of Biomarkers From Cell Cultures On Microfluidic Reactors" AIChE Annual Meeting, Nashville, TN, Nov. 2009
- Wheeldon, I.R, Campbell, E., and **Banta, S.** (speaker) "Engineering Enzymes to Self-Assemble into Hydrogels for Bioelectrocatalysis" National Meeting of the American Chemical Society, Washington, D.C., Aug. 2009
- Campbell, E. (speaker), Wheeldon, I.R. **Banta, S.** "Towards a general dehydrogenase enzymatic platform: Engineering an alcohol dehydrogenase for self-assembly and for activity with alternative substrates" National Meeting of the American Chemical Society, Washington, D.C., Aug. 2009
- Gao, S. Simon, M.J., Morrison III, B., and **Banta, S.** (speaker) "Engineering of Targeted Cell Penetrating Peptides for Delivery to the Brain" National Meeting of the American Chemical Society, Washington, D.C., Aug. 2009
- Szilvay, G.R. (speaker), Blenner, M.A., Shur, O., Cropek, D.M., and **Banta, S.** "The Beta Roll Peptide as a Novel Allosterically-Regulated Scaffold for Biomolecular Recognition" National Meeting of the American Chemical Society, Washington, D.C., Aug. 2009
- Banta, S.** (speaker) "The Beta Roll Peptide as a Novel Allosterically-Regulated Scaffold for Biomolecular Recognition" Biochemical Engineering XVI, Burlington, VT, Jul. 2009
- Blenner, M.A. (speaker), Szilvay, G.R., Shur, O., Cropek, D.M., and **Banta, S.** "Intrinsically Disordered RTX Motifs as Scaffolds for Engineering Allosterically Controlled Biomolecular Recognition" Chemical Biology Discussion Group Meeting, New York Academy of Sciences, New York, NY, June 2009
- Banta, S.** (speaker) "Protein Engineering of a Thermostable Alcohol Dehydrogenase for Enzymatic Biofuel Cell Applications" Multi-Enzyme Cascades for Biofuel Oxidation and Hydrogen Evolution Mini-Symposium, Virginia Polytechnic Institute, Roanoke VA, Apr. 2009.
- Banta, S.** (speaker) "Enzymatic and Bioactive Hydrogels from Proteinaceous Bifunctional Building Blocks" Society for Biological Engineering, 2<sup>nd</sup> International Conference on Biomolecular Engineering, Santa Barbara CA, Jan. 2009.
- Cropek, D. (speaker), **Banta, S.**, Blenner, M.A., Szilvay, G., Shur, O. "Beta Roll Peptide Structures for Allosterically Controlled Biomolecular Recognition and Decontamination" Chemical and Biological Defense Physical Science and Technology Conference, New Orleans, LA, Nov. 2008
- Glykys, D.J. (speaker), Szilvay, G., Tortosa, P., Suarez, M., Jaramillo, A., and **Banta, S.** "Expression and Characterization of a Computationally Designed Laccase-Like Enzyme" AIChE Annual Meeting, Philadelphia, PA, Nov. 2008
- Wheeldon, I.R. (speaker), Joshua Gallaway, Scott Calabrese Barton and **Banta, S.** "Self-Assembling Bi-functional Proteins for Bioelectrocatalytic Hydrogels: A Protein Engineering Approach to Advanced Materials Design" AIChE Annual Meeting, Philadelphia, PA, Nov. 2008
- Campbell, E. (speaker) and **Banta, S.** "Protein Engineering of a Thermostable Alcohol Dehydrogenase to Alter Cofactor and Substrate Specificities" AIChE Annual Meeting, Philadelphia, PA, Nov. 2008

- Gao, S. (speaker), Simon, M.J., Morrison III, B., and **Banta, S.** "DNA Delivery to Neuronal-Like Cells Using Designed Recombinant Fusion Proteins" AICHE Annual Meeting, Philadelphia, PA, Nov. 2008
- Wheeldon, I.R. (speaker) and **Banta, S.** "Enzymatic Hydrogels from Proteinaceous Bi-functional Building Blocks" AICHE Annual Meeting, Philadelphia, PA, Nov. 2008
- Wheeldon, I.R. (speaker) and **Banta, S.** "Hydrogel forming enzymes: bifunctional proteins with enzymatic and cross-linking functionalities" National Meeting of the American Chemical Society, Philadelphia, PA, Aug. 2008
- Wheeldon, I.R., and **Banta, S.** (speaker) "Self-assembling enzymatic and bioactive protein-based hydrogels" New York State pavilion, BIO 2008 International Meeting, San Diego, CA Jun. 2008
- Wheeldon, I.R., Calabrese Barton, S., and **Banta, S.** (speaker) "Enzymatic and Bioactive proteinaceous hydrogels from bifunctional building blocks" Electrochemical Society Meeting, Phoenix, AZ, May 2008
- Holland, J.T. (speaker), **Banta, S.**, Dolan, P., Arango, D., Manginell, M., Apblett, C., Harper, J., and Brozik, S. "Improving Glucose Oxidase Function in Fuel Cells" Electrochemical Society Meeting, Phoenix, AZ, May 2008
- Wheeldon, I.R. (speaker), Calabrese Barton, S., and **Banta, S.** "Electron-Conducting Hydrogels from Bifunctional Metallo-Polypeptides" Electrochemical Society Meeting, Phoenix, AZ, May 2008
- Gao, S. (speaker), Simon, M., Morrison III, B., and **Banta, S.** "Engineering of peptides for the targeted delivery of proteins and DNA into brain cells" AICHE Annual Meeting, Salt Lake City UT, Nov. 2007
- Chockalingam, K. (speaker) and **Banta, S.** "A Selection System for Engineering Structured Peptides" AICHE Annual Meeting, Salt Lake City UT, Nov. 2007
- Blenner, M.A. (speaker) and **Banta, S.** "Single-Chain Antibody Based Peptide Conformational Change Sensor: A Tool For The Directed Evolution Of Stimulus Responsive Peptides " AICHE Annual Meeting, Salt Lake City UT, Nov. 2007
- Glykys, D.J. (speaker) and **Banta, S.** "Metabolic Control Analysis For The Optimization Of Biofuel Cell Kinetic Performance" AICHE Annual Meeting, Salt Lake City UT, Nov. 2007
- Wheeldon, I.R. (speaker), Calabrese Barton, S., and **Banta, S.** "Self-assembling bioactive protein-based hydrogels with tunable structural properties" AICHE Annual Meeting, Salt Lake City UT, Nov. 2007
- Blenner, M., Chockalingam, K., and **Banta, S.** (speaker) "Directed Evolution of Conformational Changes in Peptides" National Meeting of the American Chemical Society , Boston, MA, Aug. 2007
- Gao, S., Simon, M., Morrison III, B., and **Banta, S.** (speaker) "Directed Evolution of Cell Penetrating Peptides for Delivery Across the Blood Brain Barrier to Specific Cellular Targets" Invited research seminar, 7th Annual Packard Center for ALS Research Symposium, Baltimore, MD, Apr. 2007
- Gao, S., Simon, M., Morrison III, B., and **Banta, S.** (speaker) "Directed Evolution of Cell Penetrating Peptides for Delivery Across the Blood Brain Barrier to Specific Cellular Targets" Invited research seminar, 6th Annual Packard Center for ALS Research Symposium, Baltimore, MD, Apr. 2006

**SELECTED OTHER PRESENTATIONS (1998-2004)**

- Banta, S.** (speaker), Casali, M., Kelly, Z, Mavroidis, C., and Yarmush, M. "Site-directed mutagenesis of a peptide from the hemagglutinin protein of the influenza virus: potential application for nanorobotics" AIChE Annual Meeting, Austin TX, Nov. 2004.
- Banta, S.** (speaker), Yokoyama, T., Berthiaume, F., and Yarmush, M. "Attenuation of Post-Burn Hypermetabolism: A Clinical Intervention Characterized by Metabolic Flux Analysis" AIChE Annual Meeting, San Francisco CA, Nov. 2003.
- Banta, S.** (speaker) "Metabolic Engineering: Advances in Modeling and Intervention in Health and Disease" Center for Engineering and Medicine Summer Minisymposium, Boston MA, Aug. 2003.
- Banta, S.** (speaker), Yokoyama, T., Berthiaume, F., and Yarmush, M. "Metabolic flux analysis of skeletal muscle in post-burn hypermetabolism" AIChE Annual Meeting, Indianapolis IN, Nov. 2002.
- Banta, S.** (speaker) and Anderson, S. "Engineering the cofactor specificity of *Corynebacterium* 2,5-diketo-D-gluconic acid reductase for use in vitamin C biosynthesis" AIChE Annual Meeting, Reno NV, Oct. 2001.
- Banta, S.** (presenter) and Anderson, S. "Site-Directed Mutagenesis of 2,5-diketo-D-Gluconic Acid Reductase for Use in Vitamin C Biosynthesis in a Metabolically Engineered Organism" AIChE Annual Meeting, Miami FL, Nov. 1998.

**ACADEMIC SERVICE**

Chair Undergraduate Committee, Dept. of Chem Engineering, Columbia	2013-Present
Undergraduate Committee, Dept. of Chemical Engineering, Columbia	2007-Present
Faculty Search Committee, Dept. of Chem Eng, Columbia	2006-07, 08-09, 10-11, 14-15, 15-16
Safety Officer, Dept. of Chemical Engineering, Columbia	2004-08
Graduate Committee, Dept. of Chemical Engineering, Columbia	2004-07

**PROFESSIONAL SERVICE**

## PROFESSION ORGANIZATION LEADERSHIP

- Past Chair, Biochemical Technologies Division (BIOT), American Chemical Society, 2015
- Chair, Biochemical Technologies Division (BIOT), American Chemical Society, 2014
- Chair Elect, Biochemical Technologies Division (BIOT), American Chemical Society, 2013

## NATIONAL AND REGIONAL MEETING ORGANIZATION

- Scientific Committee Member, 3<sup>rd</sup> European Congress of Applied Biotechnology (ECAB3), Nice, France, Sept 2015.
- Co-Organizer, ACS Biochemical Technologies Division (BIOT) Regional Networking Meeting, Columbia University, New York, NY Jan. 2015
- Academic Program Chair, Biochemical Technologies Division (BIOT), American Chemical Society Annual Meeting, Anaheim, CA Mar. 2011
- Area 15c Program Chair, American Institute of Chemical Engineers Annual Meeting, Salt Lake City UT, Nov. 2010.
- Area Coordinator for Emerging Technologies, Biochemical Technologies Division (BIOT), American Chemical Society Annual Meeting, San Francisco, CA Mar. 2010



Area 15c Vice Program Chair, American Institute of Chemical Engineers Annual Meeting, Nashville TN, Nov. 2009.

NATIONAL MEETING SESSION ORGANIZATION

Chair for “Biocatalysis and Biotransformation” 3<sup>rd</sup> European Congress of Applied Biotechnology (ECAB3), Nice, France, Sept 2015.

Co-Chair for “Biomolecular Engineering” Northeast BioEngineering Conference (NEBEC), Boston, MA Apr. 2014.

Chair for “Advances in Electrofuels III” Society for Biological Engineering’s Conference of Electrofuels Research, Providence, RI, Nov. 2011.

Co-Chair for “Design of Biomolecular Structures” Biochemical and Molecular Engineering XVII, Seattle, WA, Jun. 2011.

Chair for “Evolutionary Engineering of Proteins” Society for Biological Engineering’s 3<sup>rd</sup> International Conference on Biomolecular Engineering, San Francisco CA, Jan. 2011.

Chair for “Protein Engineering I” American Institute of Chemical Engineers Annual Meeting, Nashville TN, Nov. 2009.

Co-Chair for “Advances in Metabolic Engineering I & II” American Chemical Society National Meeting, Washington, D.C., Aug. 2009.

Co-Chair for “Engineering Pathways and Complex Phenotypes” Society of Biological Engineering, 2<sup>nd</sup> International Conference on Biomolecular Engineering, Santa Barbara, CA, Jan. 2009.

Chair for “Protein Engineering I” American Institute of Chemical Engineers Annual Meeting, Philadelphia PA, Nov. 2008.

Vice-Chair for “Advances in Biocatalysis I & II” American Institute of Chemical Engineers Annual Meeting, Philadelphia PA, Nov. 2008.

Chair for “In Honor of Ed Leonard on the Occasion of his 75<sup>th</sup> Birthday” American Institute of Chemical Engineers Annual Meeting, Salt Lake City UT, Nov. 2007.

Vice-Chair for “Protein Engineering” American Institute of Chemical Engineers Annual Meeting, San Francisco CA, Nov. 2006.

Vice-Chair for “Intracellular Processes” American Institute of Chemical Engineers Annual Meeting, San Francisco CA, Nov. 2006.

Co-Chair for “Cellular and Functional Tissue Engineering: Metabolic Engineering” IEEE-Engineering in Medicine and Biology Society, New York NY, Aug. 2006.

Vice-Chair for “Systems Engineering Approaches in Biology” American Institute of Chemical Engineers Annual Meeting, Cincinnati OH, Oct. 2005.

AD HOC MANUSCRIPT REVIEWS:

*ACS Catalysis; ACS Nano; ACS Synthetic Biology; Acta Biomaterialia; Advanced Functional Materials; Advanced Materials; Advanced Science Focus; Analyst; Analytical Chemistry; Angewandte Chemie International Edition; Annals of Biomedical Engineering; Applied Microbiology & Biotechnology; Biochemical Engineering Journal; Biochemistry; Bioconjugate Chemistry; Bioinformatics; Biomacromolecules; Bioorganic & Medicinal Chemistry Letters; Biophysical Journal; Bioresource Technology; Biosensors & Bioelectronics; Biotechnology & Bioengineering; Biotechnology Journal; Biotechnology Progress; BMC Systems Biology; Cancer Letters; ChemBioChem; ChemElectroChem; Chemical Science; Chemistry & Biology; Current*

*Opinion in Biotechnology; Cytokine; Drug Discovery Today; Electroanalysis; Electrochemistry Communications; Electrochimica Acta; Energy & Environmental Science; Environmental Science & Technology; Enzyme & Microbial Technology; Expert Opinion on Drug Delivery; FASEB Journal; Gene Therapy; Industrial & Engineering Chemistry Research; Journal of Applied Biochemistry and Biotechnology; Journal of the American Chemical Society; Journal of Biotechnology; Journal of Electroanalytical Chemistry; Journal of the Electrochemical Society; Journal of Molecular Biology; Journal of Molecular Recognition; Journal of Pharmacology and Experimental Therapeutics; Macromolecules; Metabolic Engineering; Molecular BioSystems; Molecular Pharmaceutics; Nature Communications; Nature Materials; PLoS ONE; Proceedings of the National Academy of Sciences of the U.S.A.; Protein Engineering, Design & Selection; The Protein Journal; Protein Science; Pure & Applied Chemistry; Sensors & Actuators; Small*

## STUDENT SUPERVISION

### SPONSORED PHD STUDENTS (11 TOTAL)

- Xiaozheng Li (Co-mentored with A. West, PhD 2015) “Engineering and Characterization of *Acidithiobacillus ferrooxidans* for Biotechnological Applications” (Current Position - )
- Kevin Dooley (PhD 2014) “Engineering a Repeats-in-Toxin Scaffold for Stimulus-Responsive Biotechnology Applications” (Current Position - Postdoctoral Fellow at Harvard Medical School)
- Tushar Patel (PhD 2013) “Engineering heterogeneous biocatalysts” (Current Position - Chemical Engineer Bristol-Myers Squibb)
- Oren Shur (PhD 2012) “Engineering the repeats-in-toxin domain for biotechnology applications” (Current Position - Boston Consulting Group)
- Flora Felsovalyi (Co-mentored with S. Kumar, PhD 2012) “Mechanistic Study of the Adsorption and Desorption of Proteins on Silica” (Current Position - Chemical Engineer at Hoffman la Roche)
- Asli Sahin (Co-mentored with A. West, PhD 2012) “Development of electrochemical methods for detection of pesticides and biofuel production” (Current Position - Chemical Engineer at IBM)
- Elliot Campbell (PhD 2011) “Towards a general dehydrogenase enzymatic scaffold for industrial biocatalysis” (Current Position - Research Scientist, Center for Advanced Biotechnology and Medicine, Rutgers University)
- Doris Glykys (PhD 2010) “Modeling and engineering of oxidoreductase proteins for miniaturized energy applications” (Current Position - Senior Scientist, Amgen)
- Shan Gao (PhD 2009) “Characterization of the TAT cell penetrating peptide and directed evolution of new cell penetrating peptides for protein and nucleotide delivery to neuronal-like cells (Current Position - Senior Chemical Engineer, Wave 80 Biosciences)
- Mark Blenner (PhD 2009) “Tools for the design and engineering of stimulus responsive peptides and intrinsically disordered peptide scaffolds (Current Position - Assistant Professor, Department of Chemical and Biomolecular Engineering, Clemson University)
- Ian Wheeldon (PhD 2009) “Bifunctional protein building blocks for functional hydrogel assembly” (Award of Distinction) (Current Position - Assistant Professor,

Department of Chemical and Environmental Engineering, University of California,  
Riverside)

PREVIOUS POSTDOCTORAL FELLOWS (11 TOTAL)

- Dr. Jennifer Haughpanah (2012-2015), (PhD 2012 from NYU-Poly, Current Position- L'Oreal)
- Dr. Sudipta Majumdar (2012-2014), (PhD 2008 from Wesleyan University, Current Position- Assistant Professor, Department of Chemistry, Indiana University of Pennsylvania)
- Dr. Wendell Khunjar (2010-2011), Co-Advised with Kartik Chandran, Earth and Environmental Engineering, (PhD 2008 from Virginia Tech, Current Position- Environmental Consultant)
- Dr. Yang Hee Kim (2009-2011), (PhD 2009 from Seoul National University, Korea, Current Position - Research Engineer, CJ Corporation, Korea)
- Dr. Matthew Lluís (2010-2011), (PhD 2009 from University of Texas, Current Position - Postdoctoral Fellow, University of Colorado, Boulder)
- Dr. Jun Wu (2009-2010), (PhD 2006 from Case Western Reserve University, Current Position - Scientist at Atotech)
- Dr. Geza Szilvay (2008-10), (PhD 2007 from University of Helsinki, Finland, Current Position - Research Scientist, VTT Technical Research Centre, Finland)
- Dr. Jong Pil Park (2008-2009), (PhD 2004 from KAIST, South Korea, Current Position - Assistant Professor of Herbal Pharmaceutical Engineering, Daegu Haany University, Korea)
- Dr. J. Todd Holland (2007-2009), (PhD 2007 from University of Illinois, Urbana-Champaign, Current Position - Postdoctoral Fellow, Virginia Tech)
- Dr. Xiaojun Chen (2007-2008), (PhD 2003 from Nanyang Technological University, Singapore, Current Position - Research Scientist, Institute of Bioengineering and Nanotechnology, Singapore)
- Dr. Karupiah Chockalingam (2006-2008), (PhD 2006 from University of Illinois, Urbana-Champaign, Current Position - Research Professor, Texas A&M University)

CURRENT PHD STUDENTS (6 TOTAL)

- Matthew Lebovich (PhD Expected 2019)
- Walaa Abdallah (PhD Expected 2018)
- Beyza Bulutoglu (PhD Expected 2016)
- Harun Ozbakir (PhD Expected 2016)
- Kristen Garcia (PhD Expected 2016)
- Timothy Kernan (Dept of Physiology & Cellular Biophysics, PhD Expected 2016)

CURRENT POSTDOCTORAL FELLOWS (2 TOTAL)

- Dr. Indrani Banerjee (2015-), (PhD 2012 from Rensselaer Polytechnic Institute)
- Dr. Kusum Solanki (2015-), (PhD 2011 from IIT Delhi)

## PHD THESIS COMMITTEES (31 TOTAL)

- Marie Harton (2015) "Harnessing Growth Selections in *Saccharomyces cerevisiae* for Biological Engineering" (Virginia Cornish Advisor, Dept of Chemistry)
- Xiaoxuan Sun (2015) "Electrodeposition and electroless deposition of copper in interconnect technology and biotechnology related applications" (Alan West Advisor)
- Wenjing Guo (2015) "Design and synthesis of novel nucleotide analogs and protein conjugates for DNA sequencing" (Jingyue Ju Advisor)
- Feng Qiao (2014) "Investigation of copper electrodeposition: Impact of inorganics and lab-scale tool design" (Alan West Advisor)
- Mithun Radhakrishna (2014) "Effect of surface curvature and chemistry on protein stability, adsorption and aggregation" (Sanat Kumar Advisor)
- Edward Swanson (2014) "Catalytic enhancement of mineral weathering for the capture and storage of carbon dioxide" (A.-H. Alissa Park Advisor, Dept of Earth and Environmental Engineering)
- Joseph Lai-man Woo (2013) "Gas-aerosol model for mechanism analysis: Kinetic prediction of gas- and aqueous-phase chemistry of atmospheric aerosols" (V. Faye McNeill Advisor)
- Yanir Maidenberg (2013) "Directed Self-Assembly of Polymer-Decorated Nanoparticles" (Jeff Koberstein Advisor)
- Allison Schwier (2012) "Surfactant Behavior in Atmospheric Aerosols" (V. Faye McNeill Advisor)
- John Cacciatore (2012) "The Engineering of Chinese Hamster Ovary Cells to Achieve More Efficient Gene Amplification for Improving Biopharmaceutical Development" (Edward Leonard Advisor)
- Oya Okman (2012) "Fabrication and Applications of Nanoporous Gold" (Jeff Kaiser Advisor, Department of Mechanical Engineering)
- Neha Sareen (2012) "Sources and chemistry of secondary organic aerosols formed from carbonyl compounds" (V. Faye McNeill Advisor)
- Vikas Jain (2011) "Dynamics in Peptide Folding, Surface Activity, and Self-Assembly" (Raymond Tu Advisor, Dept of Chem Eng, City College of New York City)
- Cherry Chen (2011) "Engineering Microbubbles with the Buried-Ligand Architecture for Targeted Ultrasound Molecular Imaging" (Mark Borden Advisor)
- Zhengwei Liu (2011) "Studies of Cobalt Hard Gold Electroplating: Experiment and Simulation" (Alan West Advisor)
- Roland Stefandl (2010) "Polymerization in Confined Space" (Carl Gryte Advisor)
- Jason Warner (2010) "Biophysical Mechanisms on the Pathway to Membrane Fusion" (Ben O'Shaughnessy Advisor)
- Melissa Simon (2010) "Evaluation and Development of Cell Penetrating Peptides for Brain Cell Delivery" (Barclay Morrison III Advisor, Dept of Biomed Eng)
- Sumit Sharma (2010) "Conformational Changes in Proteins Upon Adsorption to Surfaces" (Sanat Kumar Advisor)
- Ugur Emekli (2010) "Initial Stages of Direct Copper Electrodeposition: Simulation and Experiment" (Alan West Advisor)

- Napoleon Tercero (2010) "Characterization and Application of Morpholino Monolayers in Nucleic Acid Diagnostics" (Rastislav Levicky Advisor)
- Kristin Shattuck McKenzie (2010) "An Electrochemical Investigation of the Removal and Planarization of Copper and Ruthenium" (Alan West Advisor)
- Adam Whalley (2009) "Carbon Nanotubes: Single Molecule Electronics and Progress Towards End Cap Synthesis" (Colin Nuckolls Advisor, Dept of Chemistry)
- Owen Crowther (2009) "In situ Observations of Lithium Dendrite Growth" (Alan West Advisor)
- Ensing Lin (2009) "Mathematical Modeling and Simulation of a Cylindrical Nickel Metal Hydride Battery" (Huk Cheh Advisor)
- Hongjun Liu (2009) "Computer Simulation of Self-assembly of Complex Systems: Application to Globular Proteins and Grafted Nanoparticles" (Sanat Kumar Advisor)
- Robert Bozic (2008) "Developing Methods for the Detection of Ordnance Related Compounds" (Alan West Advisor)
- Mona Larsen (2007) "Understanding Particulate Flow in Microfluidics and Novel Designs of Biopolymer Nanoparticles" (Nina Shapley Advisor)
- Joshua Gallaway (2007) "Redox Polymer Mediation for Enzymatic Biofuel Cells" (Scott Calabrese-Barton Advisor)
- Yuhao Sun (2006) "Electrodes for Biocatalytic Fuel Cells" (Scott Calabrese-Barton Advisor)
- Gang Shan (2005) "DNA Monolayers: Precipitation and Electrochemical Characterization" (Rastislav Levicky Advisor)
- Hameer Ruparel (2005) "Novel DNA Sequencing and Genotyping Approaches Using Modified Nucleotide Analogues" (Jingyue Ju Advisor)

## **PROFESSIONAL MEMBERSHIPS**

American Institute of Chemical Engineers  
American Association for the Advancement of Science  
American Chemical Society  
Society for Biological Engineering  
The Electrochemical Society