

# John C. Conboy

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## **Education:**

1986-1989 Chabot College, Hayward, CA  
1989-1991 B.S., University of California, Davis, Davis, CA  
1991-1996 Ph.D., University of Oregon, Eugene, OR  
Advisor: Prof. Geraldine L. Richmond

## **Professional Appointments:**

1996 – 1997 Postdoctoral Associate  
Prof. Paul F. Barbara  
Department of Chemistry, University of Minnesota, Minneapolis, MN  
1998 – 1999 Postdoctoral Associate  
Prof. S. Scott Saavedra  
Department of Chemistry, University of Arizona, Tucson, AZ  
1999 – 2000 National Institutes of Health (NIH) Post Doctoral Fellow (NRSA)  
Prof. S. Scott Saavedra  
Department of Chemistry, University of Arizona, Tucson, AZ  
2000 – 2003 Assistant Professor  
Department of Chemistry, University of Utah, Salt Lake City, UT  
2003 – 2006 Henry Eyring Assistant Professor  
Department of Chemistry, University of Utah, Salt Lake City, UT  
2006 – 2009 Associate Professor, Henry Eyring Scholar  
Department of Chemistry, University of Utah, Salt Lake City, UT  
2009 – Present Professor, Henry Eyring Scholar  
Department of Chemistry, University of Utah, Salt Lake City, UT

## **Honors and Awards:**

1988 CRC Freshman Chemistry Award  
1992 – 1994 Department of Education (DOEd) Teacher/Scholar,  
Graduate Assistance in Areas of National Need (GAANN)  
1995 Electrochemical Society, Energy Research Summer Fellowship,  
Department of Energy (DOE)  
1999 – 2000 National Institutes of Health Post Doctoral Fellow,  
National Research Service Award (NRSA)  
2003 – 2006 Henry Eyring Assistant Professor  
2006 – Present Henry Eyring Scholar  
2008 Coblenz Society Craver Award in Applied Analytical Vibrational  
Spectroscopy

## **Professional Service:**

### ***Symposia Organization:***

- Co-Chair/Organizer, Society of Western Analytical Professors, 42<sup>nd</sup> Annual Meeting, Salt Lake City, Utah, February 5-6, 2010
- Symposium Organizer, "Nonlinear Optical Methods for Surface Analysis and Characterization", 237<sup>th</sup> National ACS Meeting, Salt Lake City, Utah, 2009
- Symposium Organizer, "Lipid Assemblies: Preparation, Characterization and Applications", 237<sup>th</sup> National ACS Meeting, Salt Lake City, Utah, 2009
- Symposium Organizer, "Coblentz Society Clara Craver Award Symposium Honoring John Conboy (Awardee)", The 35th Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Reno, NV September 28 - October 2, 2008
- Symposium Organizer, "The Next Generation of Analytical Surface Scientist", Northwest Regional American Chemical Society Meeting, Park City, Utah, 2008
- Symposium Organizer, "Analytical Chemistry at the Biology Interface", Northwest Regional American Chemical Society Meeting, Ogden, Utah, June 6-10, 2004
- Chair/Organizer, Society of Western Analytical Professors, 37<sup>th</sup> Annual Meeting, Salt Lake City, Utah, January 16-17, 2004
- Co-Organizer, "Nanoscale Organization via Self-Assembly", 77<sup>th</sup> American Chemical Society, Colloid and Surface Science Symposium, Georgia Tech, June 15-18, 2003.

### **Professional Service (continued):**

Co-Organizer/Chair, "Spectroscopy at Interfaces", 28<sup>th</sup> Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Detroit, October 7-11, 2001.

### ***Membership in Professional Societies:***

American Chemical Society, Biophysical Society, Society for Applied Spectroscopy, The Coblentz Society

### **Departmental Service:**

2000 – 2001	Graduate Education Committee
2004 – 2008	Graduate Education Committee
2000 – 2003	Analytical/Physical Seminar & Colloquium Committee
2000 – 2005	Graduate Admissions Committee
2001 – 2004	Analytical Chemistry Faculty Search Committee
2002 – 2003	Chair, Analytical Faculty Search Committee
2003 – 2012	Technical Support Committee (Optical)
2005 – 2006	Physical Chemistry Faculty Search Committee
2006 – 2007	Analytical Division Chair/Advisory Committee
2008 – 2009	Undergraduate Education Committee, Curriculum Development
2009 – 2010	Analytical Division Chair/Advisory Committee
2010 – 2010	Thatcher Addition, Building Committee Chair
2010 – 2012	Chair, Chemistry Department Space and Facilities Committee
2011 – 2012	Chair, Retention, Promotion and Tenure Committee
2012 – Present	Chair, Graduate Education Committee
2014 – 2015	Chair, Retention, Promotion and Tenure Committee

2014 – Present ChemSAC Advisor

**University Service:**

2001 – 2003 Undergraduate Education Curriculum Committee (Physical and Life Sciences)  
2007 – 2010 Academic Senate  
2007 – 2011 Director of the Masters of Science and Technology, Biotechnology Track  
2008 – 2011 Chair Science Education Building Committee (College of Science)  
2008 – 2011 College of Science, State Science Initiative Task Force  
2009 – 2010 Executive Committee of the Academic Senate  
2009 – 2010 Academic Senate Executive Committee  
2009 – 2010 College of Science Dean’s Kitchen Cabinet  
2009 – 2012 College of Science, Science and Math Education Committee  
2009 – 2012 College of Science Council  
2012 – Present Academic Senate  
2014 – Present Crocker Science Center Building Committee

**External Service:**

2009 – 2012 Society for Applied Spectroscopy (SAS), Publications Committee  
2012 – Present National Science Foundation, Review Panel

### **Publications (in chronological order):**

- 1) Conboy, J. C., Daschbach, J. L., Richmond, G. L., "Studies of the Alkane/Water Interface by Total Internal Reflection Second Harmonic Generation", *J. Phys. Chem.*, **1994**, *98*, 9688-9692.
- 2) Conboy, J. C., Daschbach, J. L., Richmond, G. L., "Total Internal Reflection Second-Harmonic Generation: Probing the Alkane/Water Interface". *Appl. Phys. A.*, **1994**, *59*, 623-629.
- 3) Messmer, M. C., Conboy, J. C., Richmond, G. L., "Resonant Sum Frequency Generation Studies of Surfactant Ordering at Oil-Water Interfaces", SPIE Proceedings, **1995**, *2547*, 135-41.
- 4) Messmer, M. C., Conboy, J. C., Richmond, G. L., "Observation of Molecular Ordering at the Liquid-Liquid Interface by Resonant Sum Frequency Generation", *J. Am. Chem. Soc.*, **1995**, *117*, 8039-8040.  
  
"Surfactant Molecules Ordering Viewed at Liquid/Liquid Interface", *C&E News*, **1995**, *73*, 6-7.
- 5) Conboy, J. C., Richmond, G. L., "Total Internal Reflection Second Harmonic Generation from the Interface Between Two Immiscible Electrolyte Solutions ", *Electrochimica Acta*, **1995**, *40*, 2886-2886.
- 6) Conboy, J. C., Messmer, M. C., Richmond, G. L., "Investigation of Surfactant Conformation and Order at the Liquid/Liquid Interface by Total Internal Reflection Sum-Frequency Vibrational Spectroscopy", *J. Phys. Chem. B*, **1995**, *100*, 7617-7622.
- 7) Rightor, E.G., Sehanobish, K., Young, G. P., Conboy, J. C., Wilchester, J. W., Bosnyak, C. P., "Real Time Study of Failure Events in Polymers, Part II", *J. Materials Sci.*, **1995**, *30*, 2083-2090.
- 8) Rightor, E. G., Young, G.P., Sehanobish, K., Conboy, J. C., Bosnyak, C. P., "Real Time Study of Failure Events in Polymers, Part I", *J. Materials Sci.*, **1995**, *30*, 2077-2082.
- 9) Conboy, J. C., "Application of Second Harmonic Generation to the Investigation of the Electrochemical Interface between Two Immiscible Electrolyte Solutions", *Interface*, **1996**, *5*, 49-52.
- 10) Conboy, J. C., Richmond, G. L., "Examination of the Electrochemical Interface Between Two Immiscible Electrolyte Solutions by Second Harmonic Generation", *J. Phys. Chem. B*, **1997**, *101*, 983-990.
- 11) Conboy, J. C., Messmer, M. C., Walker, R. A., Richmond, G. L., "An Investigation of Surfactant Behavior at the Liquid/Liquid Interface with Sum-Frequency Vibrational Spectroscopy", *Progs. Colloid Polym. Sci.*, **1997**, *103*, 10-20.
- 12) Conboy, J. C., Messmer, M. C., Richmond, G. L., "Dependence of Alkyl Chain Conformation of Simple Ionic Surfactants on Head Group Functionality as Studied by Sum Frequency Vibrational Spectroscopy", *J. Phys. Chem. B*, **1997**, *101*, 6724-6733.
- 13) Walker, R. A., Conboy, J. C., Richmond, G. L., "Molecular Structure and Ordering of Phospholipids at a Liquid/Liquid Interface", *Langmuir* , **1997**, *13*, 3070-3073.

- 14) Conboy, J. C., Messmer, M. C., Richmond, G. L., "Effect of Alkyl Chain Length on the Conformation and Order of Simple Ionic Surfactants Adsorbed at the D<sub>2</sub>O-CCl<sub>4</sub> Interface as Studied by Sum-Frequency Vibrational Spectroscopy", *Langmuir*, **1998**, *14*, 6722-6727.
- 15) Conboy, J. C., Olson, E. J. C., Adams, D. M., Kerimo, J., Zaban, A., Gregg, B. A., Barbara, P. F., "Effect of Solvent Vapor Annealing on the Morphology and Photophysics of Molecular Semiconductor Thin Films", *J. Phys. Chem. B*, **1998**, *102*, 4516-4525.
- 16) Conboy, J. C., McReynolds, K. D., Gervay-Hague, J., Saavedra, S. S., "Gp120 Binds Cooperatively to Several Biologically Relevant Glycosphingolipids: Quantitative Measurements at Equilibrium Using Total Internal Reflection Fluorescence Microscopy", *Angew. Chem. Int. Edit.*, **2000**, *16*, 2882-2884.
- 17) Ross, E. E., Bondurant, B., Spratt, T., Conboy, J. C., O'Brien, D. F., Saavedra, S. S., "Formation of Self-Assembled, Air-Stable Lipid Bilayer Membranes on Solid Supports", *Langmuir*, **2001**, *17*, 2305-2307.
- 18) Conboy, J. C.; McReynolds, K. D.; Gervay-Hague, J., Saavedra, S. S., "Quantitative Measurements of Recombinant HIV Surface Glycoprotein 120 Binding to Several Glycosphingolipids Expressed in Planar Supported Lipid Bilayers", *J. Am. Chem. Soc.*, **2002**, *124*, 968-977.
- 19) McReynolds, K. D., Bhat, A., Conboy, J. C., Saavedra, S. S., Gervay-Hague, J., "Non-Natural Glycosphingolipids and Structurally Simpler Analogues Bind HIV-1 Recombinant Gp120", *Bioorgan. Med. Chem.*, **2002**, *10*, 625-637.
- 20) Conboy, J.C., Liu, S., O'Brien, D.F., Saavedra, S.S., "Planar Supported Bilayer Polymers Formed from Bis-Diene Lipids by Langmuir-Blodgett Deposition and UV Irradiation", *Biomacromolecules*, **2003**, *4*, 841-849.
- 21) Kriech, M. A., Conboy, J.C., "Label-Free Chiral Detection of Melittin Binding to a Membrane", *J. Am. Chem. Soc.*, **2003**, *125*, 1148-1149.
- 22) Kriech, M. A., Conboy, J.C., "Measuring Melittin Binding to Planar Supported Lipid Bilayer by Chiral Second Harmonic Generation", *Anal. Chim. Acta*, **2003**, *496*, (1-2), 143-153. (Invited Article)
- 23) Cherney, D. P., Conboy, J. C., Harris, J. M., "Optical-Trapping Raman Microscopy Detection of Single Unilamellar Lipid Vesicles", *Anal. Chem.* **2003**, *75*, 6621-6628.
- 24) Kriech, M. A., Conboy, J.C., "Counter-Propagating Second Harmonic Generation: A New Technique for the Investigation of Molecular Chirality at Interfaces", *Opt. Soc. Am. B*, **2004**, *21*, 1013-1022.
- 25) Fitchett, B., Knepp, T., Conboy, J.C., "1-Alkyl-3-Methylimidazolium Bis(perfluoroalkylsulfonyl)imide Water-Immiscible Ionic Liquids: The Effect of Water on Electrochemical and Physical Properties", *J. Electrochem. Soc.* **2004**, *151*, E219-E225.
- 26) Liu, J., Conboy, J. C., "Phase Transition of a Single Lipid Bilayer Measured by Sum-Frequency Vibrational Spectroscopy", *J. Am. Chem. Soc.* **2004**, *126*, 8894-8895.
- 27) Liu, J., Conboy, J. C., "Direct Measurement of the Transbilayer Movement of Phospholipids by Sum-Frequency Vibrational Spectroscopy", *J. Am. Chem. Soc.* **2004**, *126*, 8376-8377.
- 28) Fitchett, B., Conboy, J. C., "Structure of the Room-Temperature Ionic Liquid/SiO<sub>2</sub> Interface Studied by Sum-Frequency Vibrational Spectroscopy", *J. Phys. Chem. B*, **2004**, *108*, 20255-20262.

## Publications (in chronological order):

### Continued

- 29) Kriech, M. A., Conboy, J.C., "Imaging Chirality with Surface Second Harmonic Generation Microscopy", *J. Am. Chem. Soc.*, **2005**, *127*, 2834-2835.  
"Imaging Chiral Molecules on Surfaces", *C&E News*, **2005**, *83*, 32.
- 30) Kriech, M. A., Conboy, J.C., "Using the Intrinsic Chirality of a Molecule as a Label-Free Probe to Detect Molecular Adsorption to a Surface by Second Harmonic Generation", *Appl. Spectrosc.*, **2005**, *59*, 746-753.
- 31) Fitchett, B. D., Rollins, J. B., Conboy, J. C., "1-Alkyl-3-Methylimidazolium Bis(perfluoroalkylsulfonyl)imide Water-Immiscible Ionic Liquids: Electrochemical Properties at Liquid-Liquid Interfaces", *J. Electrochem. Soc.*, **2005**, *152*, E251-E258.
- 32) Liu, J., Conboy, J. C., "1,2-Diacyl-Phosphatidylcholine Flip-Flop Measured Directly by Sum-Frequency Vibrational Spectroscopy", *Biophysical J.*, **2005**, *89*, 2522-2532.
- 33) Liu, J., Conboy, J. C., "Structure of a Gel Phase Lipid Bilayer Prepared by the Langmuir-Blodgett/Langmuir-Shäfer Method Characterized by Sum-Frequency Vibrational Spectroscopy", *Langmuir*, **2005**, *21*, 9091 - 9097.
- 34) Fitchett, B., Rollins, J. B., Conboy, J. C., "Interfacial Tension and Electrocapillary Measurements of the Room Temperature Ionic Liquid/Aqueous Interface", *Langmuir*, **2005**, *21*, 12179-12186.
- 35) Conboy, J.C., "Sum-Frequency Vibrational Spectroscopy", McGraw-Hill, 2006 Yearbook of Science and Technology, McGraw-Hill, New York, **2006**
- 36) Evans-Nguyen, Kenyon M., Fuierer, Ryan R., Fitchett, Brian D., Tolles, Lauren R., Conboy, John C., Schoenfish, Mark H., "Changes in Adsorbed Fibrinogen upon Conversion to Fibrin.", *Langmuir* **2006**, *22*, 5115-5121.
- 37) Anglin, T. C., Liu, J., Conboy, J. C., "Facile Lipid Flip-Flop in a Phospholipid Bilayer Induced by Gramicidin A Measured by Sum-Frequency Vibrational Spectroscopy Structure", *Biophysical J.*, **2007**, *9*, L01-L03.
- 38) Rollins, J. B., Fitchett, B., Conboy, J. C., "Structure and Orientation of the Imidazolium Cation at the Room Temperature Ionic Liquid/SiO<sub>2</sub> Interface Measured by Sum-Frequency Vibrational Spectroscopy", *J. Phys. Chem. B*, **2007**, *111*, 4990-4999
- 39) Liu, J., Conboy, J. C., "Asymmetric Distribution of Lipids in a Phase Segregated Phospholipid Bilayer Observed by Sum-Frequency Vibrational Spectroscopy", *J. Phys. Chem. C*, **2007**, *111*, 8988-8999
- 40) Anglin, T. C., Conboy, J. C., "Lateral Pressure Dependence of the Phospholipid Transmembrane Diffusion Rate in Planar-Supported Lipid Bilayers", *Biophysical J.*, **2008**, *95*, 186-193.
- 41) Smith, K, Gale, B. K., Conboy, J. C., "Micropatterned Lipid Bilayer Arrays Created by a Continuous Flow Micro-spotter", *Analytical Chemistry*, **2008**, *80*, 7980-7987.
- 42) Liu, J., Conboy, J. C., "Phase Segregation in Cholesterol + DSPC Lipid Bilayers Examined by Sum-Frequency Vibrational Spectroscopy", *Vibrational Spectroscopy*, **2009**, *50*, 106-115

## Publications (in chronological order):

### Continued

- 43) Nguyen, T, Rembert, K., Conboy, J.C., "Label-Free Detection of Drug-Membrane Association using Ultraviolet-Visible Sum-Frequency Generation", *Journal of the American Chemical Society*, **2009**, *131*, 1401-1403.
- 44) Rollins, J. B., Conboy, J. C., "Kinetics and Thermodynamics of Hydrogen Oxidation and Oxygen Reduction in Hydrophobic Room-Temperature Ionic Liquids", *Journal of the Electrochemical Society*, **2009**, *156*, B943-B954
- 45) James R. Joubert, Kathryn A. Smith, Erin Johnson, John P. Keogh, Vicki H. Wysocki, Bruce K. Gale, John C. Conboy, and S. Scott Saavedra, "Stable, Ligand-Doped, Poly(bis-SorbPC) Lipid Bilayer Arrays for Protein Binding and Detection", *Applied Materials and Interfaces*, **2009**, *1*, 1310-1315
- 46) Timothy C. Anglin, Krystal L. Brown, John C. Conboy, "Phospholipid Flip-flop Modulated by Transmembrane Peptides WALP and Melittin", *Journal of Structural Biology*, **2009**, *168*, 37-52
- 47) Anglin, T. C, Conboy, J. C., "Kinetics and thermodynamics of flip-flop in binary phospholipid membranes measured by sum-frequency vibrational spectroscopy", *Biochemistry*, **2009**, *48*, 10220-10234
- 48) Anglin, T. C, Hao, L., Cooper, M. P., Chandler, K., Conboy, J. C., "Free Energy and Entropy of Activation for Phospholipid Flip-Flop in Planar Supported Lipid Bilayers", *Journal of Physical Chemistry B*, **2010**, *114*, 1903-1914
- 49) Smith, K., Conboy, J. C., "Using Micropatterned Lipid Bilayer Arrays to Measure the Effect of Membrane Composition on Merocyanine 540 Binding", *Biochimica et Biophysica Acta, Biomembranes*, **2011**, *1808*, 1611-1617.
- 50) Nguyen, Trang T.; Conboy, John C, "High-Throughput Screening of Drug-Lipid Membrane Interactions via Counter-Propagating Second Harmonic Generation Imaging", *Analytical Chemistry*, **2011**, *83*, 5979-5988.
- 51) Brown, K, Conboy, J. C., "Electrostatic Induction of Lipid Asymmetry", *Journal of the American Chemical Society*, **2011**, *133*, 8794-8797.
- 52) Nguyen, Trang T.; Rembert, Kelvin; Conboy, John C., "Label-Free Detection of Drug-Membrane Association Using Ultraviolet-Visible Sum-Frequency Generation", [Erratum to document cited in CA150:159298], *Journal of the American Chemical Society*, **2011**, *133*, 6096-6097.
- 53) Nguyen, Trang T.; Sly, Krystal L.; Conboy, John C., "Comparison of the Energetics of Avidin, Streptavidin, NeutrAvidin, and Anti-Biotin Antibody Binding to Biotinylated Lipid Bilayer Examined by Second-Harmonic Generation", *Analytical Chemistry*, **2012**, *84*, 201-208.
- 54) Sly, Krystal L.; Nguyen, Trang T; Conboy, John C., "Lens-less surface second harmonic imaging" *Opt. Express*, **2012**, *20*, 21953-21967.
- 55) Smith, Kathryn A.; Conboy, John C., "A Simplified Sum-Frequency Vibrational Imaging Setup Used for Imaging Lipid Bilayer Arrays", *Analytical Chemistry*, **2012**, *84*, 8122-8126.

## **Publications (in chronological order):**

### **Continued**

- 56) Liu, J.; Brown, Krystal L.; Conboy, J. C., "The effect of cholesterol on the intrinsic rate of lipid flip-flop as measured by sum-frequency vibrational spectroscopy", *Faraday Discussions*, **2013**, *161* (Lipid and Membrane Biophysics), 45-61.
- 57) Brown, K, Conboy, J. C., "Lipid Flip-Flop in Binary Membranes Composed of Phosphatidylserine and Phosphatidylcholine", *Journal of Physical Chemistry B.*, **2013**, *117*, 15041-15050.
- 58) Sly, Krystal L.; Mok, S.-W; Conboy, John C., "Second Harmonic Correlation Spectroscopy: A Method for Determining Surface Binding Kinetics and Thermodynamics" *Analytical Chemistry*, **2013**, *85*, 8429-8435.
- 59) Allhusen, John S.; Conboy John C., "Preparation and Characterization of Conductive and Transparent Ruthenium Dioxide Sol-Gel Films", *ACS Applied Materials and Interfaces*, **2013**, *5*, 11683-11681.
- 60) de Beer, Alex G. F.; Chen, Yixing; Scheu, Rudiger; Conboy, John C.; Roke, Sylvie , "Analysis of Complex Spectra Using Fourier Filtering", *Journal of Physical Chemistry C.*, **2013**, *117*, 26582-26587.
- 61) Stokes, Grace Y.; Conboy, John C.; "Measuring Selective Estrogen Receptor Modulator (SERM)-Membrane Interactions with Second Harmonic Generation", *JACS*, **2014**, *136*, 1409-1417.
- 62) Sly, Krystal L.; Conboy, John C.; "Determination of Multivalent Protein-Ligand Binding Kinetics by Second-Harmonic Correlation Spectroscopy", *Analytical Chemistry*, **2014**, *ASAP*

### **Patents:**

- 1) "Stabilized, Biocompatible Supported Lipid Membrane", Saavedra, S. S., O'Brien, D. F., Kuesters, E. H., Ross, R. E., Bondurant, B., Conboy, J.C., Patent No.: WO2002071944, Date: 3/11/02.



### **Invited Seminars and Presentations (in chronological order):**

- 1) "From Biocompatible Molecular Structures to Protein Receptor Interactions: Utilizing Polymerized Lipid Platforms for Targeted HIV-1 Inhibition"; Brigham Young University, 9/19/00
- 2) "Unraveling the Structure of Surface Confined Proteins by Nonlinear Spectroscopy"; Federation of Analytical Chemistry and Spectroscopy Societies National Meeting, Detroit, MI, 10/8/01
- 3) "Chirality as a Surface Analytical Tool: Measuring Biomolecule Adsorption to Surfaces", Department of Chemistry, Clarkson University, Potsdam NY, 4/28/03
- 4) "Are Water-Immiscible Room Temperature Ionic Liquids Really Water Immiscible? Water and Its Effect on the Physical Properties of 1-Alkyl-3-Methylimidazolium Bis(perfluoroalkylsulfonyl) imide Ionic Liquids", Department of Chemistry, University of Missouri-Columbia, 10/10/03
- 5) "Membrane Lipid Flip-Flop and More: The Structural and Thermodynamic Properties of Supported Lipid Membranes Measured by Sum-Frequency Vibrational Spectroscopy", 227<sup>th</sup> American Chemical Society National Meeting, Anaheim, CA, 3/31/04
- 6) "Structural and Thermodynamic Measurements of Planar Supported Lipid Bilayers by Sum Frequency Vibrational Spectroscopy", Northwest Regional American Chemical Society Meeting, Ogden, Utah, 6/6/04
- 7) "Direct Measurement of Lipid Flip-Flop in Phospholipid Bilayers: Using Sum-Frequency Vibrational Spectroscopy to Measure Membrane Asymmetry", Department of Chemistry, University of Arizona, 1/27/05
- 8) "Direct Measurement of Lipid Flip-Flop in Phospholipid Bilayers: Using Sum-Frequency Vibrational Spectroscopy to Measure Membrane Asymmetry", Department of Chemistry, Purdue University, 2/01/05
- 9) "Direct Measurement of Lipid Flip-Flop in Phospholipid Bilayers: Using Sum-Frequency Vibrational Spectroscopy to Measure Membrane Asymmetry", Department of Chemistry and Biochemistry, University of Colorado, 2/21/05
- 10) "Direct Measurement of Lipid Flip-Flop in Phospholipid Bilayers: Using Sum-Frequency Vibrational Spectroscopy to Measure Membrane Asymmetry", Department of Chemistry, Colorado State University, 2/23/05
- 11) "Lipid Transbilayer Transport Measured Directly by Sum-Frequency Vibrational Spectroscopy", 56<sup>th</sup> Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, FL, 3/3/05
- 12) "A New Analytical Approach to Measuring Lipid Flip-Flop in Phospholipid Bilayers: Direct Measurement of Membrane Asymmetry Using Sum-Frequency Vibrational Spectroscopy", 229<sup>th</sup> American Chemical Society National Meeting, San Diego, CA, 3/14/05, The Next Generation of Analytical Chemistry Professionals

## **Invited Seminars and Presentations (in chronological order):**

### **Continued**

- 13) "Detecting Molecular Adsorption to a Surface: Using Chirality as a Label-Free Probe", 229<sup>th</sup> American Chemical Society National Meeting, San Diego, CA, 3/14/05
- 14) "Direct Measurement of Lipid Flip-Flop in Phospholipid Bilayers: Using Sum-Frequency Vibrational Spectroscopy to Measure Membrane Asymmetry", Department of Chemistry, Ohio State University, 3/28/05
- 15) "Direct Measurement of Lipid Flip-Flop in Phospholipid Bilayers: Using Sum-Frequency Vibrational Spectroscopy to Measure Membrane Asymmetry", Department of Chemistry, University of California, Davis, 4/5/05
- 16) "A New Approach to Measuring Lipid Flip-Flop in Phospholipid Bilayers: Direct Measurement of Membrane Asymmetry Using Sum-Frequency Vibrational Spectroscopy", Department of Chemistry, University of North Carolina, Chapel Hill, 4/18/05
- 17) "A Novel Label-Free Method to Detect Protein Adsorption to Ligand Arrays Using Second Harmonic Generation Microscopy", GlaxoSmithKline, 4/19/05
- 18) "Chiral Imaging: A New Approach to Measuring Protein Adsorption to Patterned Arrays", Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Quebec City, Canada, 10/6/05
- 19) "Using Lasers to Probe the Dynamics of Lipid Membranes", Department of Chemistry, John Carroll University, 10/26/05
- 20) "Lipid Flip-Flop in Phospholipid Bilayers: New Insights into Membrane Dynamics", Department of Chemistry, Case Western Reserve University, 10/27/05
- 21) "Lipid Flip-Flop in Biological Membranes: What a New Technique Can Tell Us about an Old Problem", Department of Chemistry Willamette University, Salem OR, 11/08/05
- 22) "Using Lasers to Probe the Dynamics of Lipid Membranes", Department of Chemistry, Lewis and Clark College, 11/10/05
- 23) "Cholesterol and Its Effect on Membrane Dynamics and Structure Studied by Sum-Frequency Vibrational Spectroscopy", Department of Chemistry, Michigan State University, 12/6/05
- 24) "Measuring Phospholipid Dynamics in Biological Membranes Using Sum-Frequency Vibrational Spectroscopy", 57<sup>th</sup> Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, Florida, 3/12/06
- 25) "Nonlinear Optical Studies of Interfaces", 231<sup>th</sup> American Chemical Society National Meeting, Atlanta, GA, 3/26/06
- 26) "Physical properties of the room temperature ionic liquid / aqueous interface", 232<sup>nd</sup> American Chemical Society National Meeting, San Francisco, CA, 9/13/06

## **Invited Seminars and Presentations (in chronological order):**

### **Continued**

- 27) "Investigating phospholipid bilayer structure and dynamics with sum-frequency vibrational spectroscopy", 232<sup>nd</sup> American Chemical Society National Meeting, San Francisco, CA, 9/11/06
- 28) "Peptide and Small Molecule Perturbations of Lipid Structure and Studied by Sum-Frequency Vibrational Spectroscopy", 58<sup>th</sup> Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, Illinois, 2/25/07
- 29) "Small molecule and peptide perturbations of phospholipid bilayer structure and dynamics", 233<sup>rd</sup> American Chemical Society National Meeting, Chicago, IL, 3/27/07
- 30) "Electrochemical and spectroscopic investigation of the room temperature ionic liquid/aqueous interface", 233<sup>rd</sup> American Chemical Society National Meeting, Chicago, IL, 3/28/07
- 31) "Eukaryotic membrane lipid asymmetry: what a new analytical technique can tell us about an old problem.", Indiana University, Bloomington, IN, 3/25/08
- 32) "Nonlinear vibrational spectroscopy for the analysis of biological membranes", Telluride Science Research Center Conference: Nonlinear Optics at Interfaces, Telluride, CO, 6/23/08
- 33) "Elucidating the structure of the room temperature ionic liquid/SiO<sub>2</sub> interface with sum-frequency vibrational spectroscopy", 236<sup>th</sup> American Chemical Society National Meeting, Philadelphia, PA, 8/08
- 34) Craver Award Presentation, Federation of Analytical Chemistry and Spectroscopy Societies National Meeting, Reno, NV, 10/08
- 35) "Utilizing Nonlinear Vibrational Spectroscopy for the Characterization of Biomembrane Interfaces", International Symposium on Biomass and Biointerfaces, Hokkaido University, Japan, 10/08
- 36) "Quantitative and Label-Free Detection of Drug Association to Lipid Membranes" Interfacial Bioanalytical Chemistry: Sensors, Probes, and Molecular Recognition, 60<sup>th</sup> Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, Illinois, 2/09
- 37) "Applications of Nonlinear Vibrational Spectroscopy for the Analysis of Lipid Membrane Structure and Dynamics", Vibrational Spectroscopy of Macromolecules: From Polymers to Biology, A Symposium Honoring Bob Snyder, 60<sup>th</sup> Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, Illinois, 2/09
- 38) "Influence of Transmembrane Peptides on Lipid Flip-Flop Studied by Sum-Frequency Vibrational Spectroscopy", 237<sup>th</sup> American Chemical Society National Meeting, Salt Lake City, UT, 3/23/09
- 39) "Nonlinear Vibrational Spectroscopy for the Analysis of Biological Membranes", Department of Chemistry, State University of New York (SUNY), Buffalo, Student Choice Seminar, 9/18/09

**Invited Seminars and Presentations (in chronological order):**

**Continued**

- 40) "Exploring the Underlying Biophysics of Eukaryotic Plasma Membrane Asymmetry by Sum-Frequency Vibrational Spectroscopy", American Physical Society Meeting, Portland Oregon, 3/17/10
- 41) "Nonlinear Imaging for High-Throughput Small-Molecule Membrane Screening", Telluride Science Research Center Conference: Nonlinear Optics at Interfaces, Telluride, CO, 6/23/10
- 43) "Creation and Relaxation of Phospholipid Compositional Asymmetry in Lipid Bilayers Examined by Sum-Frequency Vibrational Spectroscopy", XXII International Conference on Raman Spectroscopy, Boston, MA, 8/10/10
- 44) "Eukaryotic Membrane, Lipid Asymmetry: A New View on Lipid Dynamics and Membrane Structure", Department of Chemistry, Yale University, 10/26/10
- 45) "Biophysical Applications of Nonlinear Vibration Spectroscopy", Max-Planck Institute at Stuttgart, Germany, 12/10/10
- 46) "Eukaryotic Membrane Lipid Asymmetry: What a New Analytical Technique Can Tell Us About an Old Problem", Department of Chemistry, University of Notre Dame, South Bend, IN, 1/27/11
- 47) "High-Throughput and Label-Free Detection of Drug-Membrane Interactions", 2011 R Bryan Miller Symposium, 2nd Annual Alumni Lecturer, University of California, Davis, Davis, CA, 3/3/11
- 48) "SHG Imaging as a High Throughput Means of Studying Drug-Membrane Interactions", Molecular Spectroscopy at Interfaces: Advances and Applications, Federation of Analytical Chemistry and Spectroscopy Societies National Meeting, Reno, NV, 10/4/11
- 49) "Eukaryotic Membrane Lipid Asymmetry: What A New Analytical Technique Can Tell Us About An Old Problem", 63<sup>rd</sup> Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, Florida, 3/13/12
- 50) "High-Throughput and Label-Free Detection of Drug-Membrane Interactions and Membrane Properties" Telluride Science Research Center Conference: Nonlinear Optics at Interfaces, Telluride, CO, 6/17/12-6/23/12
- 51) "Effect of Cholesterol on the Intrinsic Rate of Lipid Flip-Flop as Measured by Sum-Frequency Vibrational Spectroscopy", Conboy, John C., 67<sup>th</sup> Northwest Regional Meeting of the American Chemical Society, Boise, ID, 7/24/12-7/27/12.
- 52) "Detection of drug-membrane interactions via surface second harmonic imaging", Stokes, Grace; Nugyen, Trang; Sly, Krystal; Conboy, John C., 244<sup>th</sup> ACS National Meeting & Exposition, Philadelphia, PA, 8/19/12-8/23/12.

## **Invited Seminars and Presentations (in chronological order):**

### **Continued**

- 53) "Lipid translocation and compositional asymmetry: A new perspective provided by sum-frequency vibrational spectroscopy", Jin Liu, Krystal L. Brown and John C Conboy, Faraday Discussion 161, Lipids & Membrane Biophysics, London, UK, 9/11/12-9/13/12.
- 54) "A New Perspective on Lipid Membrane Structure and Dynamics Provided by Sum-Frequency Vibrational Spectroscopy", Gordon Research Conference, Vibrational Spectroscopy, University of New England, Biddeford, ME, 8/5/12-8/10/12.
- 55) "High-Throughput Screening of Protein-Membrane and Drug-Membrane Interactions Using Lipid Microarrays Created with a Continuous Flow Microspotter™", Prof. John Conboy Department of Chemistry, University Utah, Microarray World Congress, San Diego, CA 9/26/12.
- 56) "Phosphatidylserine asymmetry in lipid bilayers and role of translocation", 245th ACS National Meeting & Exposition, New Orleans, LA, 4/8/13.
- 57) "Detection of drug-membrane and drug-protein interactions via surface second harmonic imaging and spectroscopy", 245<sup>th</sup> ACS National Meeting & Exposition, New Orleans, LA, 4/10/13.
- 58) "Structural Characterization of Biomolecules on Surfaces" symposium at the 96th Canadian Society for Chemistry meeting in Quebec City, Canada, 5/25/13-5/30/13.
- 59) "Lipid Bilayer Asymmetry and Role of Flip-Flop", Gordon Research Conference, Liquids, Chemistry & Physics, Holderness School Holderness, NH, 8/4/13-8/9/13.
- 60) "Revealing the Dynamics of Lipid Composition in Phospholipid Bilayers by Sum-Frequency Vibrational Spectroscopy", 60<sup>th</sup> AVS International Symposium, Long Beach, CA, 10/27/13-11/1/13
- 61) "Facile Lipid Flip-Flop: Fact, Fiction, or Something In-Between", Department of Chemistry, Pennsylvania State University, PA, 11/14/13
- 62) "A New View on Lipid Dynamics and Membrane Structure", Pacific Conference on Spectroscopy and Dynamics, Asilomar Conference Center, Pacific Grove, CA, 01/30/14-02/02/14
- 63) "Phosphatidylserine compositional asymmetry in eukaryotic membranes: The role of native lipid transport and external forces in maintaining lipid distribution", Biomembrane Synthesis, Structure, Mechanics and Dynamics, 247<sup>th</sup> ACS Meeting, Dallas, TX, 03/16/14-03/20/14
- 64) "Protein-binding interactions on membranes measured using the new technique of second harmonic correlation spectroscopy", ACS Award in Colloid and Surface Chemistry: Symposium in Honor of Kenneth B. Eisenthal, 247<sup>th</sup> ACS Meeting, Dallas, TX, 03/16/14-03/20/14
- 65) "Eukaryotic Lipid Membrane Asymmetry: What a New Technique Can Tell Us about an Old Problem" Distinguished Lecture in Biological Engineering, Ecole Polytechnique Federale De Lausanne, Lausanne, Switzerland, 04/04/14

**Invited Seminars and Presentations (in chronological order):**

**Continued**

- 66) "Second Harmonic Correlation Spectroscopy: A New Method for Measuring the Kinetics and Thermodynamics of Molecular Surface Adsorption", 97<sup>th</sup> Canadian Chemistry Conference, Vancouver, B.C., 06/01/14

**Contributed Seminars and Presentations (in chronological order):**

**(Presentations made by students appear with author list.)**

- 1) "Studies of the n-Alkane/Water Interface by Total Internal Reflection Second Harmonic Generation"; Graduate Student Teacher/Scholar Symposium, 6/24/94
- 2) "Probing the Alkane/Water Interface by Second Harmonic Generation"; 207<sup>th</sup> ACS National Meeting Division of Physical Chemistry, San Diego, CA, 3/16/94
- 3) "Nonlinear Optical Studies of Liquid/Liquid Interfaces", Electrochemistry Gordon Research Conference, Ventura, CA, 1/15/95
- 4) "Nonlinear Optical Studies of Oil/Water Interfaces"; 42<sup>nd</sup> Annual Western Spectroscopy Association Conference, Asilomar, CA, 2/29/95
- 5) "Total Internal Reflection Second Harmonic Generation from the Interface between Two Immiscible Electrolyte Solutions", 187<sup>th</sup> Electrochemical Society Meeting, Reno, NV, 5/21/95
- 6) "Sum Frequency Vibrational Spectroscopy of Biological Molecules at the Liquid/Liquid Interface"; 211<sup>th</sup> American Chemical Society National Meeting, Division of Colloid and Surface Science, New Orleans, LA, 3/24/96
- 7) "A Comparison of Surfactant Conformation and Head Group Functionality of Surfactants at the Liquid/Liquid Interface by Resonant Sum Frequency Generation"; 210<sup>th</sup> American Chemical Society National Meeting, Division of Colloid and Surface Science, Chicago, IL, 8/20/96
- 8) "Preparation and Characterization of Planar Supported Phospholipid Bilayers"; 217<sup>th</sup> American Chemical Society National Meeting, Division of Biotechnology, Anaheim, CA, 3/21/99
- 9) "Polymer Planar Supported Phospholipid Bilayers as Biocompatible Substrates"; 46<sup>th</sup> International Symposium, American Vacuum Society, Seattle, WA, 10/25/99
- 10) "Probing the Structure of Surface Confined Proteins by Nonlinear Spectroscopies", 222<sup>nd</sup> American Chemical Society National Meeting, Division of Colloid and Surface Science, Boston 8/22/02
- 11) "Measuring the Chirality of Surface Confined Proteins and DNA by Second Harmonic Generation Circular Dichroism Spectroscopy", Federation of Analytical Chemistry and Spectroscopy Societies National Meeting, 10/14/02
- 12) "Chirality as a Surface Analytical Tool", 36<sup>th</sup> Annual Society of Western Analytical Professors, California State University Fullerton, 3/01/03
- 13) "Synthesis, Characterization, and Electrochemistry of Hydrophobic Room-Temperature Ionic Liquids" Fitchett, Brian D.; Knepp, Travis; Conboy, John C., 225<sup>th</sup> American Chemical Society National Meeting, New Orleans, LA, 3/27/03
- 14) "Investigation of Biomolecular Secondary Structure at Interfaces Using Counter-Propagating Second Harmonic Generation" Kriech, Matthew A.; Conboy, John C., 225<sup>th</sup> American Chemical Society National Meeting, New Orleans, LA, 3/27/03

**Contributed Seminars and Presentations (in chronological order):**

**Continued**

- 15) "Measuring Biomolecule Adsorption to Solid/Liquid Interfaces with Second Harmonic Generation", 225<sup>th</sup> American Chemical Society National Meeting, Division of Colloid and Surface Science, New Orleans, LA, 3/24/03
- 16) "Measuring Biomolecule Adsorption to Membrane Surfaces with Nonlinear Spectroscopies", Kriech, Matthew A., Conboy, John C, 77<sup>th</sup> American Chemical Society Colloid and Surface Science Symposium, Georgia Tech, 5/18/03
- 17) "Spectroscopic Analysis of the Phase Transition Temperature of a Single Lipid Bilayer by Nonlinear Optical Methods", 37th Annual Society of Western Analytical Professors, University of Utah, Salt Lake City, UT, 1/17/04
- 18) "Using SHG to Probe the Thermodynamic, Kinetic, and Spectroscopic Properties of Proteins Binding to Lipid Membranes", Kriech, Matthew A.; Neilson, Rebecca V.; Sims, Matthew C.; Conboy, John C, Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society, Logan, UT, 6/9/04
- 19) "Label-Free Detection of Anti-Biotin IgG Binding to Biotin-Labeled Phospholipids by SHG", Neilson, Rebecca V.; Kriech, Matthew A.; Conboy, John C., Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society, Logan, UT, 6/9/04
- 20) "Investigation of Amino Acid Modified Phospholipid Bilayers by Second Harmonic Generation", Sims, Matthew C.; Kriech, Matthew A.; Conboy, John C., Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society, Logan, UT, 6/9/04
- 21) "Investigation of Phospholipid Phase Transitions and Flip-Flop Thermodynamics by Sum-Frequency Generation Liu, Jin; Conboy, John C., Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society, Logan, UT, 6/9/04
- 22) "Electrochemistry and Spectroscopy of Hydrophobic Room Temperature Ionic Liquids", Fitchett, Brian D.; Rollins, Julie; Knepp, Travis; Conboy, John C., Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society, Logan, UT, 6/9/04
- 23) "Chirality as a Surface Analytical Tool: Measuring Biomolecule Adsorption to Surfaces", Conboy, John C.; Kriech, Matthew A.; Neilson, Rebecca V.; Sims, Matthew C.; Bioanalytical Sensors, Gordon Research Conferences, Queen's College, Oxford, UK, 7/4/04
- 24) "Deciphering the Dynamics and Structure of Lipid Membranes: Lipid Flip-Flop and the Role of Membrane Defects", Chemistry at Interfaces, Gordon Research Conference, Kimball Union Academy, Meriden, NH, 8/15/04
- 25) "Imaging Chirality", 38<sup>th</sup> Annual Society of Western Analytical Professors, Colorado State University, Fort Collins, CO, 1/14/05



## **Contributed Seminars and Presentations (in chronological order):**

### **Continued**

- 26) "Sum Frequency Generation Vibrational Spectroscopy Study of the Room Temperature Ionic Liquid-Silica Interface", Fitchett, B.D., Conboy, J.C., 230<sup>th</sup> American Chemical Society National Meeting, Washington, DC, 8/28/2005
- 27) "Properties of the Room Temperature Ionic Liquid/Aqueous Interface", Fitchett, B.D., Rollins, J. B., Conboy, J.C., 230<sup>th</sup> American Chemical Society National Meeting, Washington, DC, 8/29/2005
- 28) "Water Structure at a Biomembrane Surface Studied by Sum-Frequency Generation Vibrational Spectroscopy", Liu, J., Conboy, J. C., 230<sup>th</sup> American Chemical Society National Meeting, Washington, DC, 8/29/2005
- 29) "The effect of cholesterol on biomembrane asymmetry investigated by sum-frequency generation vibrational spectroscopy", Liu, J., Conboy, J. C., 230<sup>th</sup> American Chemical Society National Meeting, Washington, DC, 9/1/2005
- 30) "A Sum-Frequency Vibrational Spectroscopy Study of Headgroup and Surface Pressure Dependence of Phospholipid Flip-Flop in Planar Supported Lipid Bilayers", Anglin, T. C., Liu, J., Conboy, J. C., 50<sup>th</sup> Biophysical Society Meeting, Salt Lake City, Utah, 2/22/06
- 31) "The Effect of Cholesterol on the Intrinsic Rate of Lipid Flip-Flop as Revealed by Sum-Frequency Vibrational Spectroscopy", Liu, J., Anglin, T. C., Conboy, J. C., 50<sup>th</sup> Biophysical Society Meeting, Salt Lake City, Utah, 2/22/06
- 32) "Label-Free Detection and Imaging of Protein Adsorption to Microarrays with Second Harmonic Generation Microscopy", Nguyen, T. T., Conboy, J. C., 50<sup>th</sup> Biophysical Society Meeting, Salt Lake City, Utah, 2/22/06
- 33) "Interfacial properties of a new class of chiral water-immiscible room temperature ionic liquids", Rollins, J. B., Conboy, J. C., 232<sup>nd</sup> American Chemical Society National Meeting National Meeting, San Francisco, CA, 9/11/06
- 34) "Phase behavior of phosphocholine + cholesterol binary mixtures in planar supported lipid bilayers investigated by sum-frequency vibrational spectroscopy", Liu, J., Anglin, T. C., Conboy, J. C., 232<sup>nd</sup> American Chemical Society National Meeting National Meeting, San Francisco, CA, 9/12/06
- 35) "Structure of the 1-alkyl-3-methylimidazolium room temperature ionic liquid/SiO<sub>2</sub> interface using sum frequency vibrational spectroscopy", Rollins, J. B., Fitchett, B. D., Conboy, J. C., 232<sup>nd</sup> ACS National Meeting, San Francisco, CA, 9/13/06
- 36) "Micro-pattered Lipid Bilayer Arrays", 40<sup>th</sup> Annual Society of Western Analytical Professors, University of Arizona, Tucson, AZ, CO, 1/26/07
- 37) "Phospholipid Flip-Flop Activation Thermodynamics", Anglin, T. C.; Cooper, M. P.; Li, H.; Chandler, K.; Conboy, J. C., 54th International American Vacuum Society Symposium, Seattle, WA. 10/18/07

## **Contributed Seminars and Presentations (in chronological order):**

### **Continued**

- 38) "Phospholipid Flip-Flop Activation Thermodynamics", Anglin, T. C.; Cooper, M. P.; Li, H.; Chandler, K.; Conboy, J. C., 2007 American Institute of Chemical Engineers Annual Meeting, Salt Lake City, UT, 11/05/07
- 39) "Label-Free Detection of Protein Adsorption in Solid Phase Assay Using UV-Visible Sum Frequency Generation Spectroscopy", Nguyen T. T., Conboy, J. C., American Institute of Chemical Engineers Annual Meeting, Salt Lake City, UT, 11/6/07
- 40) "Novel Water-Immiscible Room Temperature Ionic Liquids for Use in Hydrogen Fuel Cells", Rollins, J. B., Conboy, J. C., American Institute of Chemical Engineers Annual Meeting, Salt Lake City, UT, 11/6/07
- 41) "Micropatterned Fluid Lipid Bilayers Created Using A Continuous Flow Microspotter For Multi-Analyte Detection", Smith, K., Conboy, J. C., American Institute of Chemical Engineers Annual Meeting, Salt Lake City, UT, 11/8/07
- 42) "Label-Free Detection of Protein Adsorption and Drug-Membrane Interactions Using UV-Visible Sum Frequency Generation Spectroscopy", Nguyen T. T., Conboy, J. C., 59<sup>th</sup> Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, 3/3/08
- 43) "Sum-Frequency Vibrational Spectroscopy for the Study of Membrane Biophysics: Thermodynamics of Phospholipid Flip-Flop.", Anglin, T. C.; Cooper, M. P.; Brown, K. L.; Conboy, J. C., Joint 63<sup>rd</sup> Northwest/21<sup>st</sup> Rocky Mountain Regional ACS Meeting, Park City, UT, 6/15/08
- 44) "Protein-Mediated Lipid Flip-Flop In a Phospholipid Bilayer Measured by Sum-Frequency Vibrational Spectroscopy", Brown, K. L., Anglin, T. C., Conboy, J. C., Joint 63<sup>rd</sup> Northwest/21<sup>st</sup> Rocky Mountain Regional ACS Meeting, Park City, UT, 6/16/08
- 45) "Lipid Membrane Induced Asymmetry", Cooper, M., Conboy, J. C., Joint 63<sup>rd</sup> Northwest/21<sup>st</sup> Rocky Mountain Regional ACS Meeting, Park City, UT, 6/16/08
- 46) "Label-Free Detection of Protein Adsorption at Solid/Liquid Interface Using UV-Visible Sum Frequency Generation Spectroscopy", Nguyen T. T., Conboy, J. C., Joint 63<sup>rd</sup> Northwest/21<sup>st</sup> Rocky Mountain Regional ACS Meeting, Park City, UT, 6/16/08
- 47) "Micropatterned Fluid Lipid Bilayers Created Using a Continuous Flow Microspotter", Smith, K., Conboy, J. C., Joint 63<sup>rd</sup> Northwest/21<sup>st</sup> Rocky Mountain Regional ACS Meeting, Park City, UT, 6/16/08
- 48) "Structure and Orientation of the 1-Alkyl-3-Methylimidazolium Cation at the Room Temperature Ionic Liquid/SiO<sub>2</sub> Interface", Rollins, J., Conboy, J. C., Joint 63<sup>rd</sup> Northwest/21<sup>st</sup> Rocky Mountain Regional ACS Meeting, Park City, UT, 6/15/08

**Contributed Seminars and Presentations (in chronological order):**

**Continued**

- 49) "Label-free detection of protein and small molecules to lipid membranes using UV-Vis SFG", 236<sup>th</sup> American Chemical Society National Meeting National Meeting, Philadelphia, PA, 8/17/08
- 50) "Liquid-Liquid Electrochemistry of a New Class of Chiral Hydrophobic Room Temperature Ionic Liquids", Rollins, J., Conboy, J. C., 236<sup>th</sup> American Chemical Society National Meeting National Meeting, Philadelphia, PA, 8/19/08
- 51) "Label-Free Detection of Drug-Biological Membrane Interactions Using UV-Visible Sum Frequency Generation Spectroscopy", Nguyen T. T., Conboy, J. C., Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Reno, NV, 9/08
- 52) "Synthesis, Characterization, and Liquid-Liquid Electrochemistry of a New Class of Chiral Hydrophobic Room Temperature Ionic Liquids", Rollins, J., Conboy, J. C., Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Reno, NV, 9/08
- 53) "Micropatterned Fluid Lipid Bilayers Created Using a Continuous Flow Microspotter", Smith, K., Conboy, J. C., Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Reno, NV, 9/08
- 54) "Micropatterned fluid lipid bilayer arrays created using a continuous flow microspotter", Smith, K., Conboy, J. C., 237<sup>th</sup> American Chemical Society National Meeting, Salt Lake City, UT, 3/23/09
- 55) "Detection of drug-lipid membrane interactions with ultraviolet-visible sum frequency generation spectroscopy", Nguyen T. T., Conboy, J. C., 237<sup>th</sup> American Chemical Society National Meeting, Salt Lake City, UT, 3/23/09
- 56) "Induced Asymmetry in Lipid Bilayers Examined by Sum Frequency Vibrational Spectroscopy", Brown, K., Conboy, J. C., 237<sup>th</sup> American Chemical Society National Meeting, Salt Lake City, UT, 3/23/09
- 57) "Lipid Bilayer Arrays for Chemical Analysis", Society of Western Analytical Professors, 42<sup>nd</sup> Annual Meeting, University of Utah, Salt Lake City, Utah, 2/5/10
- 58) "Label-free imaging of drug-membrane interaction with second harmonic generation microscopy", Nguyen, Trang T.; Smith, Kathryn A.; Conboy, John C., 239<sup>th</sup> ACS National Meeting, San Francisco, CA, United States, March 21-25, 2010
- 59) "Nonlinear Imaging: Where Did The Lens Go?", Society of Western Analytical Professors, 44<sup>th</sup> Annual Meeting, University of Arizona, Tucson, AZ, 1/12/12-1/14/12.
- 59) "Investigation of protein-ligand interactions using second harmonic generation spectroscopy and imaging", Sly, Krystal L.; Nguyen, Trang T.; Conboy, John C., 243<sup>rd</sup> ACS National Meeting & Exposition, San Diego, CA, 3/25/12-3/29/12.

**Contributed Seminars and Presentations (in chronological order):**

**Continued**

- 60) “Kinetics of phosphatidylserine lipid flip-flop measured by sum-frequency vibrational spectroscopy and the implications for membrane compositional asymmetry”, Brown, Krystal L.; Conboy, John C., 243<sup>rd</sup>, ACS National Meeting & Exposition, San Diego, CA, 3/25/12-3/29/12.
- 61) “Influence of Divalent Cations on Phosphatidylserine Lipid Flip-Flop”, Brown, Krystal L.; Conboy, John C., Biophysical Society 57<sup>th</sup> Annual Meeting, Philadelphia, PA, 2/2/13-2/6/13.
- 62) “Characterizing the interactions between planar supported lipid bilayers and selective estrogen receptor modulators (SERMs) using second harmonic generation spectroscopy”, Stokes, Grace Y.; Conboy, John C., 246th ACS National Meeting & Exposition, Indianapolis, IN, 9/813-9/13.
- 63) “Transition state thermodynamics of cholesterol facilitated lipid flip-flop measured by sum-frequency vibrational spectroscopy.”, Allhussen, John; Conboy, John C., SCIX 10/1/14, Reno, NV,

**Collaborators:*****Postdoctoral Associates:***

06/2006 – 07/2007 Dr. Nilanjana Biswas  
06/2011 – 08/2014 Dr. Grace Stokes

***Graduate Students:***

12/2000 – 05/2006 Dr. Brian Fitchett (Hercules, Analytical Division, Wilmington, DE.)  
12/2000 – 12/2004 Dr. Matthew Kriech (Alliant Techsystems (ATK) Thiokol, Brigham City, Utah)  
12/2000 – 03/2001 James L. King (dematriculated)  
03/2002 – 08/2003 Anna Medley (Coursework Masters)  
03/2003 – 02/2007 Dr. Jin Liu (Post doc.)  
01/2004 – 01/2005 Rebecca Neilson (Thesis Masters)  
01/2004 – 11/2009 Dr. Julie Rollins (Intel, Portland, OR)  
01/2004 – 01/2005 Matthew Sims (dematriculated)  
01/2005 – 11/2008 Dr. Timothy Anglin (Postdoc, University of Minnesota)  
01/2005 – 12/2011 Dr. Trang Nguyen (Assistant Professor, Vietnam)  
01/2006 – 02/2008 Hao Li (Coursework Masters)  
05/2006 – 10/2012 Dr. Kathryn Smith  
03/2007 – 09/2009 Michael Cooper (Law School)  
04/2007 – 07/2007 Paul Tsai  
12/2007 – 09/2014 Krystal Brown  
01/2010 – Present Krystal Sly  
01/2011 – Present John Allhusen  
03/2012 – 12/2012 Story (Sze Wing) Mok (Coursework Masters)  
12/2012 – 12/2013 Adam Graham

***Undergraduate Students:***

08/2001 – 07/2002 Jamie Pero  
08/2002 – 12/2002 Michael Cross  
05/2003 – 07/2003 Ben Lai  
05/2004 – 09/2004 Cary Watterson (Westminster Undergraduate)  
05/2005 – 03/2006 Katherine Chandler  
11/2009 – Present Kasinda Goodwin

***NSF/REU Students:***

05/2001 – 08/2001 Holly Laufman  
05/2002 – 08/2002 Travis Knepp  
06/2005 – 09/2005 Diane Neff  
06/2007 – 08/2007 Nicole Gibb  
05/2008 – 08/2007 Kelvin Rembert

### **Course Work Taught:**

Fall (B), 2000; Chemistry 6710, Analytical and Chemical Measurements II

Spring (A), 2001; Chemistry 7070, Special Topics: Bioanalytical Chemistry

Fall (B), 2001; Chemistry 6710, Analytical and Chemical Measurements II

Spring (A), 2002; Chemistry 6740, Bioanalytical Chemistry (formerly Chem. 7070)

Bioanalytical Chemistry is a new course I developed which has been added to the curriculum. This course is designed to provide an overview of the analytical methods used for the separation, quantization and identification of biological molecules. The aim of the course is to expose students to the basic principles underlying the current techniques used in analytical biochemistry.

Spring (A), 2002; Chemistry 5700, Instrumental Analysis

Fall (B), 2002; Chemistry 7710, Analytical and Chemical Measurements II

Spring (A), 2002; Chemistry 5700, Instrumental Analysis

Spring (B), 2003; Chemistry 6740, Bioanalytical Chemistry

Fall (B), 2003; Chemistry 7710, Analytical and Chemical Measurements II

Spring (A), 2004; Chemistry 5700, Instrumental Analysis

Spring (A), 2004; Chemistry 6740, Bioanalytical Chemistry

Fall (A), 2004; Chemistry 7700, Analytical and Chemical Measurements I

Fall (B), 2004; Chemistry 7710, Analytical and Chemical Measurements II

Spring (A), 2005; Chemistry 6740, Bioanalytical Chemistry

Fall (A and B), 2005; Chemistry 3000, Quantitative Chemical Analysis

Spring (A), 2006; Chemistry 6740, Bioanalytical Chemistry

Fall (B), 2006; Chemistry 7730, Electrochemistry

Spring (A), 2007; Chemistry 6740, Bioanalytical Chemistry

Fall (A and B), 2007; Chemistry 3000, Quantitative Chemical Analysis

Spring (A), 2008; Chemistry 6740, Bioanalytical Chemistry

Fall (A and B), 2008; Chemistry 3000, Quantitative Chemical Analysis

Spring (A), 2009; Chemistry 6740, Bioanalytical Chemistry

Summer, 2009; Chemistry 3000, Quantitative Chemical Analysis

**Course Work Taught:**

**Continued**

Fall (B), 2009; Chemistry 7770, Optical Spectroscopy

Summer, 2010; Chemistry 3000, Quantitative Chemical Analysis

Spring (A), 2012; Chemistry 6740, Bioanalytical Chemistry

Fall (B), 2012; Chemistry 7710, Analytical and Chemical Measurements II

Spring, 2013; Chemistry 3000, Quantitative Chemical Analysis

Summer, 2013; Chemistry 3000, Quantitative Chemical Analysis

Fall (A), 2013; Chemistry 7770, Optical Spectroscopy

Spring, 2014; Chemistry 3000, Quantitative Chemical Analysis

Fall (A), 2014; Chemistry 7770, Optical Spectroscopy

Spring, 2015; Chemistry 3000, Quantitative Chemical Analysis