

**Elsa C. Y. Yan**  
Department of Chemistry  
Yale University  
225 Prospect Street  
New Haven, CT06511  
Tel: (203) 436-2509  
Email: elsa.yan@yale.edu  
Website: <http://ursula.chem.yale.edu/~yanlab/Index.html>

### Education

- **2000** Ph.D. (Distinction) Columbia University, New York, NY  
Advisor: Prof. Kenneth B. Eisenthal  
Thesis Title: *Second Harmonic Generation as a Surface Probe for Colloidal Particles*
- **1999** M.Phil. Columbia University, New York, NY
- **1996** M.A. Columbia University, New York, NY
- **1995** B.Sc. (First Class Honors) Chinese University of Hong Kong, Hong Kong

### Professional Appointments

- 2014-** Professor, Yale University, New Haven, CT  
**2012-2014** Associate Professor, Yale University, New Haven, CT  
**2007-2012** Assistant Professor, Yale University, New Haven, CT  
**2010-2013** Adjunct Associate Professor, Chinese University of Hong Kong, Hong Kong  
**2004-2007** Postdoctoral Research Associate, Rockefeller University, New York, NY  
**2005-2006** Adjunct Assistant Professor, Hunter College, CUNY, New York, NY  
**2000-2004** Postdoctoral Fellow, UC Berkeley, CA (Mentor: Prof. Richard Mathies)  
Visiting Fellow, Rockefeller University, New York, NY (Mentor: Prof. Thomas Sakmar)  
**1995-2000** Research Assistant, Columbia University, New York, NY (Mentor: Prof. Kenneth Eisenthal)

### Honors and Awards

- **Elected Chair**, Gordon Research Conference: *Vibrational Spectroscopy*, 2016
- **Elected Vice Chair**, Gordon Research Conference: *Vibrational Spectroscopy*, Aug 2014
- **Early Excellent in Physical Organic Chemistry**, Journal of Physical Organic Chemistry, Oct 2012
- **The Greer Memorial Prize for Achievement in Research**, Yale University, Oct 2011
- **Invited Speaker**, Symposium in Honor of 100th Anniversary of Marie Curie's Nobel Prize for International Year of Chemistry, ACS Meeting, Denver, CO, Aug 2011
- **2011 Tour speaker**, Society of Applied Spectroscopy, Frederick, MD, 2011
- **NSF CAREER Award**, the National Science Foundation, 2010
- **ACS Petroleum Research Award**, Petroleum Research Fund, American Chemical Society, 2009
- **Starter Grant Award** for high-quality innovative research by beginning chemistry professors, Spectroscopy Society of Pittsburgh, 2008
- **Invited Speaker**, Gordon Research Conference: *Vibrational Spectroscopy*, Biddeford, ME, 2010
- **Individual National Research Service Award** (F32 EY014308-01), Proposal title: Structure and Dynamics of the Primary Event in Vision, National Institutes of Health, Bethesda, MD, 2003. [Note: Priority Score: 101. Not activated due to a delay of issuing I-55 (Green) Card]
- **Distinction for Doctor of Philosophy**, Columbia University, New York, NY, 2000
- **Pegram Award for excellent achievement in graduate research**, Department of Chemistry, Columbia University, New York, NY, 2000
- **Graduate Faculty Fellowship**, Columbia University, New York, NY, 1995-2000
- **Sir Edward Youde Memorial Scholarship** for outstanding academic achievement, Sir Edward Youde Memorial Fund Council, Hong Kong, 1994
- **First Prize in Chemistry Olympiad**, Hong Kong Chemical Society and UK Royal Society of Chemistry, 1993
- **First Class Honors for B.Sc.**, Chinese University of Hong Kong, Hong Kong, 1995

## Publications at Yale:

(\*Corresponding Author, #Undergraduate Student, and †Equal Contribution)

Link to a complete and updated list of publications:

[http://scholar.google.com/citations?sortby=pubdate&hl=en&user=hZg5aOsAAAAJ&view\\_op=list\\_works](http://scholar.google.com/citations?sortby=pubdate&hl=en&user=hZg5aOsAAAAJ&view_op=list_works)

29. Yan, E.C.Y.\* Fu, L.; Wang, Z. "Kinetics of Protein Conformational Changes at Interfaces Probed by Chiral Vibrational Sum Frequency Generation Spectroscopy" *Invited Submission as a Feature Article, Langmuir, In Preparation.*
28. Xiao, D.†; Fu, L.†; Yan, E.C.Y.\*, Batista, V.S.\* "Cloaking the Visibility of Molecular Chirality in  $\alpha$ -Helical Proteins" *In preparation.*
27. Fu, L.†; Xiao, D.; Almeida, D.; Gellman, S.H.; Batista, V.S.; Yan, E.C.Y.\* "Parallel  $\beta$ -sheet at Interface Studied by Chiral Sum Frequency Generation Spectroscopy" *In preparation.*
26. Mooney, M.L.; Liu, J.; Sekharan, S.; Batista, V.S.; Yan, E.C.Y.\* "Kinetics of Siberian Hamster UV Pigment's Thermal Activation Mechanism" *In preparation.*
25. Yan, E.C.Y.\* Fu, L.; Wang, Z.; Liu, W "Proteins at Interfaces Probed by Chiral Sum Frequency Generation Spectroscopy" *Invited Submission as a Feature Article, J. Phys. Chem., In preparation, 2014*
24. Guo, Y.; Sekharan, S.; Liu, J.; Batista, V.S.; Tully, J.C.; Yan, E.C.Y.\* "Role of Unusual Temperature-Dependent Kinetics of Thermal Reactions of Rhodopsin in Vertebrate Dim-Light Vision" *Proc. Natl. Acad. Sci. U.S.A., In press, 2014*
23. Yan, E.C.Y.\* Fu, L.; Wang, Z.; Liu, W "Biological Macromolecules at Interfaces Probed by Chiral Sum Frequency Generation Spectroscopy" *Chem. Rev., Article ASAP, 2014*
22. Fu, L.; Wang, Z.; Yan, E.C.Y.\* "Assignment of Protein N-H Stretching Modes Observed by Chiral Sum frequency Generation Spectroscopy to Peptide Backbone" *Chirality, In press, 2014*
21. Sekharan, S.\*; Mooney, M.L.; Rivalta, I.; Kazmi, M.A.; Neitz, M.; Neitz, J.; Sakmar, T.P.; Yan, E.C.Y.\*; Batista, V.B.\* "Spectral Tuning of Ultraviolet Cone Pigments: An Interhelical Lock Mechanism" *J. Am. Chem. Soc.* 135, 19064, **2013**
20. Liu, W; Wang, Z; Fu, L; Leblanc, R.M.; Yan, E.C.Y.\* "Lipid Compositions Modulate Fluidity and Stability of Bilayers: Characterization by Surface Pressure and Sum Frequency Generation Spectroscopy" *Langmuir* 29, 15022, **2013**
19. Guo, Y.; Young, K.; Yan, E.C.Y.\* Book Chapter: "Guided Inquiry and Project-Based Learning in Biophysical Spectroscopy" *Teaching Bioanalytical Chemistry*, Edited by Harvey J. M. Hou, ACS Books, Chapter 13, p261-291, **2013**
18. Liu, M.Y. #; Liu, J; Mehrotra, D; Yan, E.C.Y.\* "Thermal Stability of Rhodopsin and Progression of Retinitis Pigmentosa: A Comparison of S186W and D190N Rhodopsin Mutants" *J. Biol. Chem.* 288, 17698, **2013**
17. Wang, Z.; Fu, L.; Yan, E.C.Y.\* "C-H Stretch for Probing Self-Assembly of LK $\beta$  into Chiral Macromolecular Structures at the Air-Water Interface by Chiral Sum Frequency Generation Spectroscopy" *Langmuir* 29, 4077, **2013**
16. Fu, L.†; Xiao, D.Q.†; Wang, Z.; Batista, V. S.\*; Yan, E.C.Y.\* "Chiral Sum Frequency Generation for In Situ Probing Proton Exchange in Antiparallel  $\beta$ -Sheet Peptides at Interfaces" *J. Am. Chem. Soc.* 135, 3592, **2013**
15. Mitra, N.†; Liu, Y.†; Liu, J.; Serebryany, E.; Mooney, V.; DeVree, B.T.; Sunahara, R.; Yan, E.C.Y.\* "Calcium-Dependent Ligand Binding and G-protein Signaling of Family B GPCR Parathyroid Hormone 1 Receptor Purified in Nanodiscs" *ACS Chem. Biol.* 8, 617, **2013**
14. Mooney, V.L.; Szundi, I.; Lewis, J.W.; Yan, E.C.Y.\*; Kliger, D.S.\* "Schiff base protonation changes in siberian hamster ultraviolet cone pigment photointermediates" *Biochemistry* 51, 2603, **2012**
13. You, Y.M.†; Bloomfield, A.†; Liu, J.; Fu, L.; Herzon, S.\*; Yan, E.C.Y.\* "Kinetics of Surfactant Molecules Transferring between Emulsion Particles Probed by Second Harmonic Generation Spectroscopy" *J. Am. Chem. Soc.* 134, 4264, **2012**

12. Zhu, G. A.<sup>#</sup>; Serebryany, E.<sup>#</sup>; **Yan, E.C.Y.\*** "Rational Design of Supramolecular Lipid/Detergent Assemblies for Purification of G Protein-Coupled Receptors" *Encyclopedia of Supramolecular Chemistry*, **2012**
11. Xiao, D.<sup>†</sup>; Fu, L.<sup>†</sup>; Liu, J.; Batista, V.S.\*; **Yan, E.C.Y.\*** "Amphiphilic Adsorption of Human Islet Amyloid Polypeptide Aggregates to Lipid/Aqueous Interfaces" *J. Mol. Biol.* 421, 537, **2012**
10. Fu, L.; Wang, Z.; **Yan, E.C.Y.\*** "Chiral Vibrational Structures of Proteins at Interfaces Probe by Sum Frequency Generation Spectroscopy" Invited Submission, Special Issue: *Applications of Circular Dichroism*, *Int. J. Mol. Sci.* 12, 9404, **2011**
9. Serebryany, E.<sup>#</sup>; Zhu, G.F.<sup>#</sup>; Fu, L.; Liu, J.; **Yan, E.C.Y.\*** "Artificial Membrane-like Environments for *In Vitro* Studies of Purified G-protein Coupled Receptors" Invited Review, *BBA-Biomembrane* 1818, 225, **2011**
8. Liu, J.; Liu, M.<sup>#</sup>; Fu, L.; **Yan, E.C.Y.\*** "Chemical Kinetic Analysis of Thermal Decay of Rhodopsin Reveals Unusual Energetics of Thermal Isomerization and Hydrolysis of Schiff Base" *J. Biol. Chem.* 286, 38408, **2011**
7. Liu, J.; Liu, M.Y.<sup>#</sup>; Mooney, V.; Bhagat, A.; Nguyen, J; **Yan, E.C.Y.\*** "Thermal Properties of Rhodopsin: Insight into Molecular Mechanism of Dim-Light Vision" *J. Biol. Chem.* 286, 27622, **2011**
6. Fu, L.; Liu, J.; **Yan, E.C.Y.\*** "Chiral Sum Frequency Generation Spectroscopy for Characterizing Protein Secondary Structures at Interfaces" *J. Am. Chem. Soc.* 133, 8094, **2011**
5. Wu, W. T.; Mitra, N.; **Yan, E.C.Y.;** Zhou, S.Q.\* "Integration of Optical Glucose Sensing and Self-Regulated Insulin Release into a Single Hybrid Nanogel Particle" *ACS Nano* 4, 4831, **2010**
4. Durrell, A.; Gray, H.; Hazari, N.\*; Incarvito, C.; Liu, J.; **Yan, E.C.Y.** "Tris (hydroxypropyl) phosphine Oxide: A Chiral Three-Dimensional Material with Non-linear Optical Properties" *Cryst. Growth Des.* 10, 1482, **2010**
3. Fu, L.; Ma, G.; **Yan, E.C.Y.\*** "*In Situ* Misfolding of Human Islet Amyloid Polypeptide at Interfaces Probed by Sum Frequency Generation Spectroscopy" *J. Am. Chem. Soc.* 132, 5405, **2010**
2. Liu, J; Liu, M.Y.<sup>#</sup>; Nguyen, J.B., Bhagat A., Mooney, V; **Yan, E.C.Y.\*** "Thermal Decay of Rhodopsin: Role of Hydrogen Bonds in Thermal Isomerization of 11-*cis* Retinal in the Binding Site and Hydrolysis of Protonated Schiff Base" *J. Am. Chem. Soc.* 131, 8750, **2009**
1. Ma, G.; Liu, J; Fu, L.; **Yan, E.C.Y.\*** "Probing Water and Biomolecules at the Air/Water Interface with a Broad-Bandwidth Vibrational Sum Frequency Generation Spectrometer from 3800 to 900 Wavenumber" *Appl. Spectro.* 63, 528, **2009**

#### **Publications Prior to Yale:**

21. "6-*s-cis* Conformation and Polar Binding Pocket of the Retinal Chromophore in the Photoactivated State of Rhodopsin" Ahuja, S; Eilers, M.; Hirshfeld, A.; **Yan, E.C.Y.;** Ziliox, M.; Sakmar, T.P.; Sheves, M.; Smith, S.O. *J. Am. Chem. Soc.* 131, 15160, **2009**
20. Ahuja, S; Hornak, V.; **Yan, E.C.Y.;** Syrett, N.; Goncalves, J.; Hirshfeld, A.; Ziliox, M.; Sakmar, T.P.; Sheves, M.; Reeves, P.J.; Smith, S.O.; Eilers, M. "Helix Movement is Coupled to Displacement of Extracellular Loop 2 in Rhodopsin Activation" *Nat. Struct. Mol. Biol.* 16, 168, **2009**
19. Ye, S.; Köhrer, C.; Huber, T.; Kazmi, M.; **Yan, E.C.Y.;** Sachdev, P.; Bhagat, A.<sup>#</sup>; RajBhandary, U.L.; Sakmar, T.P. "Site-specific Incorporation of Keto Amino Acids Into Functional G Protein-Coupled Receptors Using Unnatural Amino Acid Mutagenesis" *J. Biol. Chem.* 283, 1525, **2008**
18. **Yan, E.C.Y.\*;** Lewis, J.W.; Szundi, I; Epps, J.; Bhagat, A.; Kliger, D.S. "Photointermediates of the Rhodopsin S186A Mutant as a Probe of the Hydrogen Bond Network in the Chromophore Pocket and Counterion Switch" *J. Phy. Chem. C.* 111, 8843, **2007**
17. Vogel, R.; Siebert, F; **Yan, E.C.Y.;** Sakmar, T.P.; Hirshfeld, A.; Sheves, M. "Modulating Rhodopsin Receptor Activation by Altering the pK<sub>a</sub> of the Retinal Schiff Base" *J. Am. Chem. Soc.* 128, 10503, **2006**
16. Ludeke, S; Beck, M.; **Yan, E.C.Y.;** Sakmar, T.P.; Siebert, F.; Vogel, R. "The Role of Glu181 in the Photoactivation of Rhodopsin." *J. Mol. Biol.* 353, 245, **2005**

15. **Yan, E.C.Y.**; Gamin, Z.<sup>#</sup>; Kazmi, M.A.; Chang, B.S.W.; Sakmar, T. P.; Mathies, R. A. "Resonance Raman Analysis of the Mechanism of Energy Storage and Chromophore Distortion in the Primary Visual Photoproduct" *Biochemistry* 43, 10867, **2004**
14. **Yan, E.C.Y.**; Kazmi, M.A.; Gamin, Z.<sup>#</sup>; Hou, J. M.; Pan, D.; Chang, B.S.W.; Sakmar, T. P.; Mathies, R. A. "Counterion Switch in the Photoactivation of G Protein-Coupled Receptor Rhodopsin" *Proc. Natl. Acad. Sci. U.S.A.* 100, 9262, **2003**
13. **Yan, E.C.Y.**; Kazmi, M.A.; De, S; Chang, S.W.; Seibert, C.; Marin, E.P.; Mathies, R.A.; Sakmar, T.P. "Function of Extracellular Loop 2 in Bovine Rhodopsin: Glutamic Acid 181 Modulates Stability and Wavelength Maximal Absorption of Metarhodopsin II" *Biochemistry* 41, 3620, **2002**
12. Shang, X.; Liu, Y.; **Yan, E.**; Eienthal, K.B. "Effect of Counterions on Molecular Transport across Liposome Bilayer: Probed by Second Harmonic Generation" *J. Phys. Chem. B.* 105, 12816, **2001**
11. **Yan, E.C.Y.**; Liu, Y.; Eienthal, K.B. "In-situ Studies of Molecular Transfer between Colloidal Surfaces by Second Harmonic Generation" *J. Phys. Chem. B.* 105, 8531, **2001**
10. Liu, Y.; **Yan, E.C.Y.**; Zhou, X. L.; Eienthal, K.B. "Surface Potential of Charged Liposomes Determined by Second Harmonic Generation" *Langmuir* 17, 2063, **2001**
9. Liu, Y.; **Yan, E.C.Y.**; Eienthal, K.B. "Effect of Bilayer Surface charge Density on Molecular Adsorption and Transport across Liposome Bilayers" *Biophys. J.* 80, 1004, **2001**
8. **Yan, E.C.Y.**; Eienthal, K.B. "Effects of Cholesterol on Molecular Transport of Organic Cations across Liposome Bilayers Probed by Second Harmonic Generation" *Biophys. J.* 79, 898, **2000**
7. **Yan, E.C.Y.**; Eienthal, K.B. "Rotational Dynamics of Anisotropic Particles Studied by Second Harmonic Generation" *J. Phys. Chem. B.* 104, 6686, **2000**
6. **Yan, E.C.Y.**; Eienthal, K.B. "Probing the Interface of Microscopic Clay Particles in Aqueous Solution by Second Harmonic Generation" *J. Phys. Chem. B.* 103, 6056, **1999**
5. **Yan, E.C.Y.**; Liu, Y.; Eienthal, K.B. "New Method for Determination of Surface Potential of Microscopic Particles by Second Harmonic Generation" *J. Phys. Chem. B* 102, 6331, **1998**
4. Wang, H.; Borguet, E.; **Yan, E.C.Y.**; Zhang, D.; Gutow, J.; Eienthal, K.B. "Molecules at Liquid and Solid Surfaces" *Langmuir* 14, 1472, **1998**
3. Wang, H.; **Yan, E.C.Y.**; Liu, Y.; Eienthal, K.B. "Energetics and Population of Molecules at Microscopic Liquid and Solid Surfaces" *J. Phys. Chem.* 102, 4446, **1998**
2. Wang, H.; **Yan, E.C.Y.**; Borguet, E.; Eienthal, K.B. "Second Harmonic Generation from the Surface of Centrosymmetric Particles in Bulk Solution" *Chem. Phys. Letts.* 259, 15, **1996**
1. Wu, C.; **Yan, C.Y.**<sup>#</sup> "Studies of the Swelling and Drying Kinetics of Thin Gel Films by In-Situ Interferometry" *Macromolecules* 27, 4516, **1994**

#### **Invited Lectures and Conference Talks (July 2007-present):**

1. "Characterization of Biomolecular Interactions at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Penn State University, University Park, PA, Apr 2015
2. "Thermal Stability of Rhodopsin" 16<sup>th</sup> International Conference on Retinal Proteins, Ngahama, Japan, Oct 2014
3. "Characterization of Biomolecular Interactions at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Lehigh University, Bethlehem, PA, Oct 2014
4. "Characterization of Biomolecular Interactions at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Telluride Science Research Center Workshop: Electronic and Magnetic Properties of Chiral Structures and their Assemblies, Telluride, CO, July 2014
5. "Characterization of Biomolecular Interactions at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Telluride Science Research Center Workshop: Nonlinear Optics and Interfaces, Telluride, CO, Jun 2014
6. "Characterization of Biomolecular Interactions at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Telluride Science Research Center Workshop: Protein and Peptide Interactions in Cellular Environments, Telluride, CO, Jun 2014

7. "Probing Orientation of Proteins at Interfaces by Chiral Vibrational Sum Frequency Generation Spectroscopy" Symposium: New Developments in Surface Spectroscopy and Microscopy *The 97th Canadian Society for Chemistry Symposium*, Vancouver BC, Canada, Jun, 2014
8. "Chiral sum frequency generation spectroscopy for characterization of biomolecular interaction at interfaces" *247<sup>th</sup> National Meeting of American Chemical Society, ACS Award in Colloid and Surface Chemistry Symposium Honoring Kenneth Eisenthal*, Dallas, TX, Mar 2014
9. "Characterization of Biomolecular Interactions at Interfaces by Chiral Sum Frequency Generation Spectroscopy" University Miami, Miami, FL, Feb, 2014
10. "Chiral Sum Frequency Generation for Characterization of Protein Secondary Structures at Interfaces" *The 60th Annual AVS International Symposium and Exhibition*, Long Beach, CA, Oct 2013
11. "An Unusual Arrhenius Pre-factor of  $10^{70} \text{ s}^{-1}$  in the Thermal Reactions of Bovine Rhodopsin" *Gordon Research Conference: Protein*, Holderness, MA, Jun 2013
12. "Chiral Sum Frequency Generation for Characterization of Protein Secondary Structures at Interfaces" *The 14th International Conference on Chiroptical Spectroscopy*, Vanderbilt University, Nashville, TN, Jun, 2013
13. "Chiral Sum Frequency Generation for Characterization of Protein Secondary Structures at Interfaces" Structural Characterization of Biomolecules on Surfaces, *The 96th Canadian Society for Chemistry symposium*, Quebec City, Canada, May, 2013
14. "Aggregation of Amyloid Proteins at Lipid/Water Interfaces Probed by Chiral Sum Frequency Generation Spectroscopy" *University of Colorado*, Boulder, CO, Apr 2013
15. "Aggregation of Amyloid Proteins at Lipid/Water Interfaces Probed by Chiral Sum Frequency Generation Spectroscopy" *University of Texas, Austin*, TX, Apr 2013
16. "Aggregation of Amyloid Proteins at Lipid/Water Interfaces Probed by Chiral Sum Frequency Generation Spectroscopy" *245<sup>th</sup> National Meeting of American Chemical Society*, Division of Physical Chemistry, New Orleans, LA, Apr 2013
17. "Chiral sum frequency generation spectroscopy probes vibrational structures of protein backbone with zero water background" *Princeton University*, Princeton, NJ, Apr 2013
18. "Chiral sum frequency generation spectroscopy probes vibrational structures of protein backbone with zero water background" *University of Chicago*, Chicago, IL, Mar 2013
19. "Early-Stage Aggregation of Amyloid Proteins on Membrane Surfaces Probed by Chiral Sum Frequency Generation Spectroscopy" *University of California, Los Angeles*, CA, Mar 2013
20. "Early-Stage Aggregation of Amyloid Proteins on Membrane Surfaces Probed by Chiral Sum Frequency Generation Spectroscopy" *University of Michigan, Ann Arbor*, MI, Feb 2013
21. "Characterization of protein secondary structures at interfaces using chiral sum frequency generation spectroscopy" *National Taiwan University*, Taipei, Taiwan, Dec 2012
22. "Characterization of protein secondary structures at interfaces using chiral sum frequency generation spectroscopy" *National Tsing Hua University*, Taipei, Taiwan, Dec 2012
23. "Characterization of protein secondary structures at interfaces using chiral sum frequency generation spectroscopy" *Academia Sinica*, Taipei, Taiwan, Dec 2012
24. "Nanodiscs Purification of a Family B G Protein-Coupled Receptor—Parathyroid Hormone 1 Receptor" 2<sup>nd</sup> Biophysics and Structural Biology Symposium, *Yale University*, New Haven, CT, Nov 2012
25. "Thermal Stability of Rhodopsin" *15<sup>th</sup> International Conference on Retinal Proteins*, Ascona, Switzerland, Oct 2012
26. "Chiral sum frequency generation spectroscopy for probing the hydrogen/deuterium exchange in proteins at interfaces" *244<sup>th</sup> National Meeting of American Chemical Society*, COLL Division, Philadelphia, PA, Aug 2012
27. "Chiral sum frequency generation spectroscopy probes protein vibrational structures with zero water background" *244<sup>th</sup> National Meeting of American Chemical Society*, Division of Analytical Chemistry, Philadelphia, PA, Aug 2012

28. "Thermal stability of rhodopsin is key to vertebrate dim-light vision" *The 244<sup>th</sup> National Meeting of American Chemical Society*, Physical Chemistry Division, Philadelphia, PA, Aug 2012
29. "Characterization of protein secondary structures at interfaces using chiral sum frequency generation spectroscopy" *244<sup>th</sup> National Meeting of American Chemical Society*, Physical Chemistry Division, Philadelphia, PA, Aug 2012
30. "Chiral Sum Frequency Generation Spectroscopy for Characterization of Protein Structures and Dynamics at Interfaces" *Gordon Research Conference: Vibrational Spectroscopy*, Biddeford, ME, Aug 2012
31. "Characterization of protein structures at interfaces using chiral sum frequency generation spectroscopy" *Telluride Science Research Center Workshop: Nonlinear Optics and Interfaces*, Telluride, CO, Jun 2012
32. "Characterization of protein secondary structures at interfaces using sum frequency generation spectroscopy" *243<sup>rd</sup> National Meeting of American Chemical Society*, Physical Chemistry Division, San Diego, CA, Mar 2012
33. "Characterization of protein secondary structures at interfaces using sum frequency generation spectroscopy" *Western Connecticut State University*, Danbury, CT, Mar 2012
34. "Rhodopsin, a Light Detector at Its Very Best!" *Chinese University of Hong Kong*, Hong Kong, Jan 2012
35. "Chiral sum frequency generation spectroscopy for characterizing protein secondary structures at interfaces" *Peking University*, Beijing, China, Dec 2011
36. "Chiral sum frequency generation spectroscopy for characterizing protein secondary structures at interfaces" *Hong Kong University of Science and Technology*, Hong Kong, Dec 2011
37. "Chiral sum frequency generation spectroscopy for characterizing protein secondary structures at interfaces" Symposium in Honor of 100th Anniversary of Marie Curie's Nobel Prize for International Year of Chemistry, *242<sup>nd</sup> National Meeting of American Chemical Society*, Denver, CO, Aug 2011
38. "Chiral Sum Frequency Generation Spectroscopy for Identification of Protein Secondary Structures at Interfaces" *Temple University*, Philadelphia, PA, Apr 2011
39. "Chiral Sum Frequency Generation Spectroscopy for Identification of Protein Secondary Structures at Interfaces" *University of Pennsylvania*, Philadelphia, PA, Apr 2011
40. "Chiral Sum Frequency Generation Spectroscopy for Identification of Protein Secondary Structures at Interfaces" *Brigham Young University*, Provo, UT, Apr 2011
41. "Misfolding of Amyloid Proteins at Interfaces Probed by Chiral Sum Frequency Generation Spectroscopy" *Pacific Northwest National Laboratory*, Richland, WA, Mar 2011
42. "Probing Protein Secondary Structures at Interfaces by Chiral Sum Frequency Generation Spectroscopy" *Trinity University*, San Antonio, TX, Mar 2011
43. "Purification of G-Protein Coupled Receptor Using Nanodiscs" *Keystone Symposia on Molecular and Cellular Biology, Transmembrane Signaling by GPCRs and Channels*, Taos, NM, Jan 2011
44. "Probing Protein Secondary Structures at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Department of Chemistry, *Chinese University of Hong Kong*, Hong Kong, Jan 2011
45. "Biophysical Studies of G Protein-Coupled Receptors: New Strategies for Purification and Labeling" Department of Chemistry, *Chinese University of Hong Kong*, Hong Kong, Jan 2011
46. "Probing Protein Secondary Structures at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Department of Chemistry, *University of Southern California*, Los Angeles, CA, Nov 2010
47. "Probing Protein Secondary Structures at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Department of Chemistry, *University of California, Irvine*, CA, Nov 2010
48. "Probing Protein Secondary Structures at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Department of Chemistry, *Tulane University*, New Orleans, LA, Nov 2010
49. "Probing Protein Secondary Structures at Interfaces by Chiral Sum Frequency Generation Spectroscopy" Department of Chemistry, *Xavier University of Louisiana*, New Orleans, LA, Nov 2010

50. "Kinetics of Amyloid Formation Probed by Chiral Sum Frequency Generation Spectroscopy" Department of Chemistry, Clark University, Worcester, MA, Oct 2010
51. "Probing the Misfolding of Amyloid Proteins at Interfaces by Sum Frequency Generation Spectroscopy" Department of Chemistry, Tufts University, Medford, MA, Oct 2010
52. "Protein Structures at Interfaces Probed by Chiral Sum Frequency Generation Spectroscopy" Faculty Lunch, Department of Chemistry, Yale University, New Haven, CT, Sep 2010
53. "Application of Chiral Vibrational Sum Frequency Generation Spectroscopy to Protein Folding at Interfaces" Gordon Research Conference: Vibrational Spectroscopy, Biddeford, ME, Aug 2010
54. "Probing Protein Folding at Interfaces by Sum Frequency Generation" Telluride Science Research Center Workshop: Nonlinear Optics and Interfaces, Telluride, CO, Jun 2010
55. "Biomolecular Interactions at Interfaces Probed by Sum Frequency Generation Spectroscopy" NSF Physical Organic Chemistry Workshop, Austin, TX, Jan 2010
56. "Rhodopsin, a Biological Light Detector at Its Very Best!" College of Staten Island, City University of New York, New York, NY, Dec 2009
57. "Rhodopsin, a Biological Light Detector at Its Very Best!" Arizona State University, Tempe, AZ, Dec 2009
58. "Rhodopsin, a Biological Light Detector at Its Very Best!" Hunter College, City University of New York, New York, NY, Nov 2009
59. "Probing Signal Transduction of G protein-Coupled Receptors" The US-China Workshop for Early Career Chemical Scientists, the U.S. National Science Foundation and the Chinese National Natural Science Foundation, Beijing, China PR, Oct. 2009
60. "Probing Folding of Intrinsically Disordered Proteins at Interfaces by Sum Frequency Generation" Telluride Science Research Center Workshop: Vibrational Dynamics, Telluride, CO, Jul 2009
61. "Thermal Decay of Rhodopsin: Role of Hydrogen Bonds in Thermal Isomerization of 11-cis Retinal in the Binding Site and Hydrolysis of Protonated Schiff Base" FASEB Summer Research Conference, Biology and Chemistry of Vision. Snowmass Village, CO, Jun 2009
62. "Thermal Properties of G Protein-Coupled Receptor Rhodopsin" Sackler Discussion Group, Department of Molecular Biophysics and Biochemistry, Yale University, New Haven, CT, Mar 2009
63. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Chemistry, University of Connecticut, Storrs, CT, Dec 2008
64. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Chemistry, Colby College, Waterville, ME, Nov 2008
65. "Rhodopsin-A Light Detector at Its Very Best!" Faculty Lunch Meeting, Department of Chemistry, Yale University, New Haven, CT, Nov 2008
66. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Chemistry, State University of New York, Buffalo, NY, Oct 2008
67. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Biochemistry, University of Western Ontario, London, Ontario, Canada, Oct 2008
68. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Chemical Physics, University of Science and Technology, Hefei, China, Aug 2008
69. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Chemistry, Fudan University, Shanghai, China, Aug 2008
70. "Interactions of Amyloid Protein with Biomembranes: Ion Permeability and Protein Structures" Telluride Science Research Workshop: Nonlinear Optics at Interfaces, Telluride, CO, Jun 2008
71. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Chemistry, City College, City University of New York, New York, NY, Apr 2008
72. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Chemistry and Biochemistry, Seton Hall University, South Orange, NJ, Apr 2008
73. "Photoactivation Mechanism of G Protein-Coupled Receptor Rhodopsin" Department of Chemistry, University of Massachusetts, Dartmouth, MA, Oct 2007

### **Contributed Talks and Posters (July 2007-present)**

1. Fu, L.; Gang, M.; Yan, E.C.Y. "Chiral vibrational sum frequency generation spectroscopy allows real-time and in situ characterization of protein secondary structures at interfaces" 243<sup>rd</sup> ACS National Meeting, San Diego, CA, Mar **2012**
2. Fu, L.; Wang, Z.; Yan, E.C.Y. "Chiral sum frequency generation spectroscopy: a probe for protein secondary structures and proton exchange at interfaces" 243<sup>rd</sup> ACS National Meeting, San Diego, CA, Mar **2012**
3. Fu, L.; Liu, J.; Yan, E.C.Y. "Characterization of protein secondary structures at interfaces using sum frequency generation spectroscopy" 243<sup>rd</sup> ACS National Meeting, San Diego, CA, Mar **2012**
4. Xiao, D.; Fu, L.; Yan, E.C.Y.; Batista, V.S. "*Ab initio* simulations of chiral sum frequency generation spectra of amyloid proteins at water/membrane interfaces." 242<sup>nd</sup> ACS National Meeting, Denver, CO, Aug **2011**
5. Fu, L.; Liu, J.; Yan, E.C.Y. "Chiral sum frequency generation spectroscopy for characterizing protein secondary structures at interfaces." 242<sup>nd</sup> ACS National Meeting, Denver, CO, Aug **2011**
6. You, Y.M.; Liu, J.; Yan, E.C.Y. "Application of second harmonic generation spectroscopy to probe kinetics of detergent molecules transferring between emulsion droplets." 242<sup>nd</sup> ACS National Meeting, Denver, CO, Aug **2011**
7. Liu, J.; Liu, M.Y.; Nguyen, J.; Bhagat, A.; Mooney, V.; Yan, E.C.Y. "Thermal properties of rhodopsin: Insight into molecular mechanism of dim-light vision." Biophysical Society 55<sup>th</sup> Annual Meeting, Baltimore, MD, March **2011**
8. Fu, L.; Ma, G.; Yan, E.C.Y. "*In situ* measurement of human islet amyloid polypeptide misfolding at lipid/water interfaces probed by sum frequency generation spectroscopy." Biophysical Society 55<sup>th</sup> Annual Meeting, Baltimore, MD, March **2011**
9. Liu, M.Y.; Liu, J.; Yan, E.C.Y. "Thermal stability of rhodopsin and implications for *Retinitis Pigmentosa*." Biophysical Society 55<sup>th</sup> Annual Meeting, Baltimore, MD, March **2011**
10. Mitra, N.; Yan, E.C.Y. "Purification of G-protein coupled receptors using nanodiscs." Biophysical Society 55<sup>th</sup> Annual Meeting, Baltimore, MD, March **2011**
11. Serebryany, E.; Yan, E.C.Y. "Ligand-binding domain of type 1 metabotropic glutamate receptor is fully functional in its monomeric form." Biophysical Society 55<sup>th</sup> Annual Meeting, Baltimore, MD, March **2011**
12. Yan, E.C.Y.; Fu, L. "Chiral sum frequency generation spectroscopy provides a set of optical vibrational markers to distinguish protein secondary structures at interfaces." Biophysical Society 55<sup>th</sup> Annual Meeting, Baltimore, MD, March **2011**
13. Liu, J.; Liu, M.Y.; Nguyen, J.; Bhagat, A.; Mooney, V.; Yan, E.C.Y. "Molecular Mechanism for Dim-Light Detection by G Protein-Coupled Receptor Rhodopsin." 241<sup>st</sup> ACS National Meeting, Anaheim, CA, March **2011**
14. Fu, L.; Liu, J.; Yan, E.C.Y. "Second-order chiral vibrational markers allow identification of protein secondary structures at interfaces." 241<sup>st</sup> ACS National Meeting, Anaheim, CA, March **2011**
15. Xiao, D.Q.; Fu, L.; Batista, V.; Yan, E.C.Y. "Determination of protein secondary structures and orientation at interfaces by chiral sum frequency generation spectroscopy and computational modeling." 241<sup>st</sup> ACS National Meeting, Anaheim, CA, March **2011**
16. You, Y.M.; Liu, J.; Yan, E.C.Y. "Probing kinetics of detergent molecules transferring between emulsion particles using second harmonic generation spectroscopy." 241<sup>st</sup> ACS National Meeting, Anaheim, CA, March **2011**
17. Fu, L.; Yan, E.C.Y. "Amyloidogenesis detected by chiral sum frequency generation spectroscopy." 241<sup>st</sup> ACS National Meeting, Anaheim, CA, March **2011**
18. Yan, E.C.Y.; Fu, L.; Ma, G. "Application of sum frequency generation to probe kinetics of protein folding at interfaces." 239<sup>th</sup> ACS National Meeting, San Francisco, CA, March **2010**
19. Yan, E.C.Y.; Fu, L.; Ma, G. "Biomolecular interactions at interfaces probed by sum frequency generation spectroscopy." 239<sup>th</sup> ACS National Meeting, San Francisco, CA, March **2010**



20. "Characterization of G Protein-Coupled Receptors Using Biophysical Spectroscopy" (Invited participant and poster presentation) *The National Academies Keck Futures Initiative Conference on Synthetic Biology*, Irvine, CA, Nov 2009

## **Research Funding**

### **Active**

- **NSF: CAREER-MCB (Role: PI)**  
Title of Project: Molecular Mechanism of Vision  
Direct Cost: \$110,000 annual  
Duration: 03/15/10-03/14/15
- **NSF- CHE (Role: PI, Co-PI: Victor S. Batista)**  
Title of Project: Characterization of Biomolecular Interactions at Interfaces Using Sum Frequency Generation Spectroscopy  
Direct Cost: \$90,000 annual  
Duration: 08/1/12-07/31/14
- **NIH-National Eye Institute (Role: Subcontractor, PI: David Kliger, UCSD)**  
Title of Project: Studies of the Activation Mechanism of Visual Pigments  
Direct Cost: \$15,000 annual  
Duration: 05/1/13-04/30/15

### **Completed**

- **Spectroscopy Society of Pittsburgh, Starter Grant (Role: PI)**  
Title of Project: Development of Vibrational SFG Spectrometer for Biological Interfaces  
Direct Cost: \$40,000 annual  
Duration: 07/01/09-06/30/10
- **American Chemical Society, Petroleum Research Fund (Role: PI)**  
Title of Project: Transport Kinetics of Surface Molecules between Emulsion Particles Probed by Surface Specific Second-Harmonic Generation  
Direct Cost: \$50,000 annual  
Duration: 09/01/2009-08/31/2011

### **Pending**

- **NSF-CHE (Role: PI)**  
Title of Project: Characterization of Biomolecular Interactions at Interfaces Using Sum Frequency Generation Spectroscopy  
Duration: 09/1/14-08/31/17  
Submission Date: Nov 2013
- **NSF- CHE (Role: Co-PI, PI: Roger M. Leblanc, U. Miami)**  
Project Title: Collaborative Research: Interaction between Human Insulin and Human Islet Amyloid Polypeptide in 2-D  
Duration: 07/1/14-06/30/17  
Submission Date: Nov 2013

## **Professional Service**

### **Symposium and Conference Organizers**

- **Elected Chair:** *Vibrational Spectroscopy*, Gordon Research Conference, 2016
- **Elected Vice Chair:** *Vibrational Spectroscopy*, Gordon Research Conference, Biddeford, ME, 2014
- **Session Chair:** *ACS Award in Colloid and Surface Chemistry Symposium Honoring Kenneth Eisenthal*, Division of Colloid and Surface Chemistry, 247<sup>th</sup> National Meeting of American Chemical Society, Dallas, TX, Mar 2014
- **Chair and Organizer:** Focus Session-*Protein Misfolding and Aggregation*, Division of Chemical Physics, American Physical Society, Annual Meeting, Baltimore, MD, Mar 2013

- **Session Chair:** *Liquid and Solid Interfaces*, Division of Chemical Physics, American Physical Society, Annual Meeting, Baltimore, MD, Mar 2013
- **Session Chair:** *Solvent Dynamics at Biomolecular Interfaces: Experiment and Theory*, Division of Physical Chemistry, 244<sup>th</sup> National Meeting of American Chemical Society, Philadelphia, PA, Aug 2012
- **Session Chair:** *Protein Secondary Structures*, Division of Physical Chemistry, 243<sup>rd</sup> National Meeting of American Chemical Society, San Diego, CA, Mar 2012

#### **Grant Review and Review Panel**

- **NSF Panelist:** NSF Panel, CHE-Chemical Structure, Dynamics and Mechanism, Apr 2014
- **Grant Reviewer:** DOE, Early Career Research Program, Department of Energy, Feb 2014
- **Grant Reviewer:** NSF, Career Award, Division of Molecular and Cellular Biosciences, Directorate for Biological Sciences, National Science Foundation, Oct 2013
- **Grant Reviewer:** German Research Foundation-Chemistry and Process Engineering, Jan 2013
- **NSF Panelist:** NSF Panel, CHE-Chemistry of Life Processes/Molecular and Cellular Biosciences, Career Award, National Science Foundation, Oct 2012
- **Grant Reviewer:** NSF, Career Award, Division of Molecular and Cellular Biosciences, Directorate for Biological Sciences, National Science Foundation, Nov 2011
- **Grant Reviewer:** NSF, The Catalyzing New International Collaboration Program, Directorate for Mathematical and Physical Sciences, National Science Foundation, Oct 2011
- **Grant Reviewer:** NSF, Career Award, Division of Chemistry, Directorate for Mathematical and Physical Sciences, National Science Foundation, Oct 2010
- **Grant Reviewer:** NSF, Career Award, Division of Molecular and Cellular Biosciences, Directorate for Biological Sciences, National Science Foundation, Sep 2010
- **Grant Reviewer:** CUNY: Collaborative Incentive Research Grant Program: City University of New York, New York, NY, Apr 2008

#### **Ph.D. External Examination**

- **Ph.D. External Examiner:** Indian Institute of Technology, Madras, India, Nov 2012

#### **Manuscript Review**

- *ACS Chemical Biology*
- *Acta Biomaterial*
- *Acta Crystallography*
- *Nature Chemistry*
- *Analytical Chemistry*
- *Langmuir*
- *Journal of American Chemical Society*
- *International Journal of Molecular Science*
- *Biochemistry*
- *Photochemistry and Photobiology*
- *Journal of Biological Chemistry*
- *BBA-Biomembrane*
- *Chemical Physics Letters*
- *Physical Chemistry Chemical Physics*
- *Journal of Physical Chemistry*
- *Journal of Physical Chemistry Letters*
- *Journal of Chemical Physics*
- *Journal of Structural Biology*
- *Journal of Molecular Biology*
- *Spectroscopy Letters*
- *Plasmid*
- *Biophysical Journal*

- *Environmental Science and Technology*
- *Acta Biomaterialia*
- *Polymer*
- *Macromolecules*
- *Biomacromolecules*
- *Angewandte Chemie International Edition*
- *Vision Research*
- *Europhysics Letters*

**Teaching—Undergraduate and Graduate Courses:**

**Hunter College, City University of New York, New York, NY**

- **2005 Fall** *Biophysical Chemistry*

Fraction of Course: 1

Enrollment: Undergraduate 38

**Yale University, New Haven, CT**

- **2007 Fall** *Physical Chemistry with Applications in Biological Sciences* (CHEM 328)

Fraction of Course: 1

Enrollment: Undergraduate 12

- **2008 Spring** *Perspectives on Science: Discussion Section* (SCIE 198)

Fraction of Course: 1

Enrollment: Undergraduate 15

- **2008 Fall** *Physical Chemistry with Applications in Biological Sciences* (CHEM 328)

Fraction of Course: 1

Enrollment: Undergraduate 22 and Graduate 2

- **2008 Fall** *Chemical Biology* (CHEM 421/521)

Fraction of Course: 1 Lecture

Enrollment: Undergraduate 22 and Graduate 2

- **2009 Spring** *Biophysical Chemistry* (CHEM 558)

Fraction of Course: 1

Enrollment: Undergraduate 1 and Graduate 14

- **2009 Spring** *Responsible Conduct of Research* (MBB 676)

Fraction of Course: 1/7

Enrollment: Graduate 40

- **2009 Fall** *Physical Chemistry with Applications in Biological Sciences* (CHEM 328)

Fraction of Course: 1

Enrollment: Undergraduate 39 and Graduate 1

- **2010 Spring** *Biophysical Spectroscopy* (CHEM558)

Fraction of Course: 1

Enrollment: Graduate 3

- **2010 Spring** *Responsible Conduct of Research* (MBB 676)

Fraction of Course: 1/7

Enrollment: Graduate 45

- **2011 Fall** *Physical Chemistry with Applications in Biological Sciences* (CHEM 328)

Fraction of Course: 1

Enrollment: Undergraduate 38 and Graduate 1

- **2012 Spring** *Biophysics: Biophysical Spectroscopy* (CHEM 558)

Fraction of Course: 1

- Enrollment: Graduate 4
- **2013 Fall** *Physical Chemistry with Applications in Biological Sciences* (CHEM 328)  
Fraction of Course: 1  
Enrollment: Undergraduate 31 and Graduate 2
  - **2014 Spring** *Biophysics: Biophysical Spectroscopy* (CHEM 558)  
Fraction of Course: 1  
Enrollment: Graduate 6
  - **2014 Spring** *Perspectives on Science and Engineering* (SCIE 199)  
Fraction of Course: 1 Lecture

### **Service to the Chemistry Department**

#### **2007-2008**

- Building Committee/Department Sub-Committee
- Graduate Admission Committee

#### **2008-2009**

- Building Committee/Department Sub-Committee
- Graduate Admission Committee
- Seminar Committee: Coordinator of Biophysical Seminar

#### **2009-2010**

- Graduate Admission Committee
- Building Committee
- Visiting Day Committee
- Junior Faculty Search Committee
- Instrument Committee
- Seminar Committee

#### **2011-2012**

- Graduate Admission Committee
- Building Committee

#### **2013-2014**

- Graduate Admission Committee
- Senior Faculty Search Committee
- Junior Faculty Search Committee

### **Service to Yale University**

- Member of the Advisory Board for the Beckman Scholars Program, Deans Office, Yale College, 2008-present
- Member of Selection Committee for Beckman Scholars, 2008-present

### **Affiliation at Yale University**

- Yale Diabetes Endocrinology Research Center, Yale School of Medicine, 2011-present
- The NIH Chemical Biology Graduate Training Program, 2008-present
- The NIH Biophysics Graduate Training Program, 2008-present
- The Raymond and Beverly Sackler Institute for Biological, Physical and Engineering Sciences, 2010-present
- The Biochemistry, Biophysics, and Structural Biology Program, 2011-present

### **Outreach**

- Host and Speaker for Lab Visit, *Annual High School Open House at the Chemistry Department*, Students from Ms. Porter's Schools, May 2012

- Host and Speaker for Lab Visit, *the Yale University Science Pathways Program*, Open House at the Chemistry Department, May 2012
- Host and Speaker for Lab Visit, *the Yale University Science Pathways Program*, Open House at the Chemistry Department, May 2011
- Host for Lab Visit, *Annual High School Open House at the Chemistry Department*, Students from West Haven High Schools, May 2010
- Host for Lab Visit, *Annual High School Open House at the Chemistry Department*, Students from Miss Porter's School and the Woodhall School, May 2009
- Speaker and Host for Lab Visit. *Annual High School Open House at the Chemistry Department* Students from Hamden High School, "Chemistry of Vision", Yale University, Nov 2008
- Speaker for the *Biotechnology Workshop for high-school biology teachers in Connecticut*, "Molecular Mechanism of Vision", Yale University, Jul 2008
- Judge for Poster and Oral Presentations, National Conference of Society for Advancement of Chicanos and Native Americans in Science, Kansas City, MO, Oct 2007
- Student Recruiter, National Conference of Society for Advancement of Chicanos and Native Americans in Science, Kansas City, MO, Oct 2007

### **Citizenship**

- Volunteer, Pathway to Science Orientation, Yale University, New Haven, Oct 2013
- Panelist, "Preparing for Publication", Co-organized by Graduate Writing Center at Yale and Women in Science at Yale, Yale University, New Haven, Oct 2012
- Graduate Student Recruiter: Interviewed Seniors at Xavier University of Louisiana, New Orleans, LA, Nov 2010
- Speaker, Monthly Meeting, Undergraduate Women in Science at Yale, Yale University, Apr 2010
- Graduate Student Recruiter: Interviewed seniors at University of Science and Technology, Hefei, China PR, Aug 2008
- Speaker for the Exchange Program, Yale University-New Asian College at the Chinese University of Hong Kong: *Globalization and Biomedical Research*, The Yale-China Association, Yale University, New Haven, CT, Feb 2008
- Panelist for Career Workshop: *New Junior Faculty Members Spill the Beans*, GSAS and The Postdoctoral Office, Yale University, New Haven, CT, Jun 2009
- Panelist for Career Workshop: *Academic Job Search-Identifying Opportunity and Preparing a Successful Application*, Yale University, New Haven, CT, Oct 2007
- Panelist for Career Workshop: *Preparing Future Faculty Colloquium*, Graduate School of Art and Science, Columbia University, New York, NY, Mar 2007

### **Research Awards Obtained by Mentees**

- Li Fu—Yale Graduate '13, Chemistry Department (CHEM)
  - The William Wiley Postdoctoral Fellowship, Pacific Northwest National Laboratory, Richland, WA, 2013
  - The Langmuir Student Award, The ACS Colloids and Surfaces Division for excellence in graduate research in the field of colloids and surface chemistry.
  - The Langmuir Presentation Award, The 86th ACS Colloids and Surface Symposium, John Hopkins University, Baltimore, MD, 2012
- Monica Yun Liu—Yale '11, Molecular, Cellular and Developmental Biology (MCDB)
  - Boell Prize for Excellence in Senior Research, Department of MCDB, Yale University, 2011
  - The Student Research Achievement Award in Molecular Biophysics, the 55<sup>th</sup> Annual Biophysical Meeting, Baltimore, MD, 2011
- Eugene Serebryany—Yale'11, Molecular Biophysics and Biochemistry (MBB)
  - The Paul Sigler Memorial Prize for graduating MBB major demonstrating excellence in scholarship and research, Department of MBB, Yale University, 2011
  - Poster Presentation Award, Raymond and Beverly Sackler Institute for Biological, Physical and Engineering Sciences, Summer Research Symposium, Yale University, New Haven, CT, 2010

- Alex Zhu—Yale'11, Chemistry (CHEM)
  - The Postbaccalaureate Intramural Research Award, the National Institutes of Health, 2011
- Carolina Salguero —Hunter College, City University of New York'11, Biochemistry
  - Poster Presentation Award at Science, Technology & Diversity for a Sustainable Future - SACNAS Annual Conference, Anaheim, September 2010

### **Undergraduate Senior Theses**

- Xiao Bai (Yale'08, MCDB)  
Thesis Title: *Site-specific Incorporation of p-Methoxyphenylalanine into Functional G Protein-Coupled Receptors*
- Tian Ho (Yale'09, CHEM)  
Thesis Title: *Synthesis and Site-Specific Incorporation of Deuterium-Labeled p-Methoxyphenylalanine into Recombinant Proteins with Mammalian Expression Systems*
- Ha Bui (Yale'10, CHEM)  
Thesis Title: *Thermal Stability of Dim-Light Photoreceptor Rhodopsin*
- Alex Zhu (Yale'11, CHEM)  
Thesis Title: *Thermal Stability of Cone versus Rod Photoreceptors*
- Monica Yun Liu (MS&BS, Yale'11, MCDB)  
Thesis Title: *Thermal Stability of Rhodopsin: Insight into Pathogenic Mechanism of Retinitis Pigmentosa*
- Eugene Serebryany (Yale'11, MBB)  
Thesis Title: *Activation Mechanism of Metabotropic Glutamate Receptor Type I*
- Jennifer Wei (Yale'13, CHEM)-Joint Student with Batista Lab  
Thesis Title: *Homology Model of Family GPCR Parathyroid Hormone 1 Receptor*

### **Doctoral Theses**

- Li Fu (CHEM'13)  
Thesis Title: *Characterization of Biomolecules at Interfaces Using Sum Frequency Generation Spectroscopy*  
Date: Aug 2013
- Victoria Mooney (CHEM'13)-Joint student with Zilm Group  
Thesis Title: *Spectroscopic Characterization of Protein Photoreceptors*  
Date: Dec 2013

### **Mentees**

#### **Postdoctoral Fellows**

- Dr. Jian Liu (07 Ph.D., Columbia U.) 2007-2011; Current position: Postdoctoral Fellow, Boston University, Boston, MA
- Dr. Gang Ma (99 Ph.D., Peking U.) 2008-2010; Current position: Professor, Hebei University, Baoding, China PR
- Dr. Nivedita Mitra (05 Ph.D., IIS, Bangaloo, India) 2009-2011; Current position: Senior Scientist, International AIDS Vaccine Initiative, India.
- Dr. YuMeng You (09 Ph.D., Nanyang Tech. U., Singapore) 2010-2011; Current position: Postdoctoral Fellow, Columbia University, New York, NY
- Dr. Supratim Guha Ray (05 Ph.D. Weizmann Inst. of Sci., Israel) 2010-2012; Current position: Postdoctoral Fellow, Northwestern University, Evanston, IL

#### **Graduate Students**

- Kelly Culhane (MBB'18)
- Yingying Cai (CHEM'17)
- Wei Liu (CHEM'17)
- Yuting Liu (CHEM'15)
- Zhuguang Wang (CHEM'15)
- Ying Guo (CHEM'15)

- Li Fu (CHEM'13)
- Victoria Mooney (CHEM'13) Joint student with Zilm Group
- Denitza Balyozova (M.S. CHEM'09)

#### **International Visiting Students**

- Anne Szklarz (Ecole Nationale Supérieure de Chimie de Lille, Lille, France) 2013
- Pedro A. Baldera Aguayo (Universidad Nacional de Ingeniería, Lima, Peru' 13) 2013
- Meike Mischo (Bochum University, Germany) 2011

#### **Undergraduate Students**

- Jennifer Wei (Yale'15, CHEM) 2012-2013
- Devi Mehrotra (Yale'14) 2010-2013
- Carolina Salguero (Hunter College'11, Biochemistry) 2010-2011
- Alex Zhu (Yale'11, CHEM) 2009-2011
- Ha Bui (Yale'10, CHEM) 2009-2010
- Tian Ho (Yale'09) 2008-09
- Monica Yun Liu (MS&BS, Yale'11, MCDB) 2008-2011
- Eugene Serebryany (Yale'11, MBB) 2008-2011
- Xiao Bai (Yale' 08) 2008-2009
- Eric Li (Yale'12, CHEM) Summer 2010
- Qi Wen Li (Syracuse'11) Mark and Pearle Clements Scholar, Summer 2009
- Alicia Bowen (Old Westbury U' 09) SURF at Yale, Summer 2008
- Carolyn Brotherton (Yale' 10) Joint student with Scott Miller, Summer 2008
- Khadija Khan (Yale' 10, Biomedical Engineering) Spring 2008

#### **Research Assistant**

- Aditi Bhagat (Hunter College'07, CUNY, New York, NY) 2007-2008
- Tapan Kanai (Utkal University, Orissa, India) 2013-

#### **High School Students**

- Aaron Green (Choate Rosemary Hall High School, Wallingford, CT) Summer 2008
- Titiana Fountain (Academy of New Haven, New Haven, CT) Summer 2010
- Sneha Shaha (Choate Rosemary Hall, Wallingford, CT) Summer 2012, 2013

#### **Rotation Students**

- James Blackemore (CHEM'12)
- Tabitha Guzman (M.S. CHEM'09)
- David Bulkey (CHEM'12)
- Jennifer Nguyen (CHEM'13)
- Pam Wong (CHEM'13)
- Jing Wang (CHEM'13)
- Changchang Liu (CHEM'13)
- Huan Lu (CHEM'14)
- Rebecca Allred (CHEM'15)
- Kelly Culhane (BBSB'18)
- Bo Wang (CHEM'18)

#### **Service on Ph.D. Thesis Committees and Qualifying Examinations**

- Katherine Shinopoulos, Brudvig Lab (CHEM'11)
- Gennady Khirich, Loria Lab (CHEM'12)
- Jennifer Nguyen, Modis Lab (CHEM'13)
- Gregory Manley, Loria Lab (CHEM'13).
- Pam Wang, Schepartz Lab (CHEM'13)
- Jing Wang, Rothman Lab (CHEM'13)
- Patrina Pellete, Rothman Lab (CHEM'13)

- Kanak Raina, Crew Lab (CHEM'13)
- Nicole (Ning-Shiuan) Lee, Batista Lab (CHEM'14)
- Beth Denton, Schepartz Lab (CHEM'15)
- Julianne Thomsen, Brudvig Lab (CHEM'15)
- Junyi Jiao, Yongli Zhang's Lab (BBS' 18)
- Karlina Kauffman, Melia's Lab (Cell Bio'18)