

## WAN-CHEN LIN

110 Anita Rd. No. 2, Burlingame, CA 94010

Office (510) 643-4847

wanlin@ucdavis.edu

---

### EDUCATION

Ph.D., Biophysics, University of California-Davis, December 2006.

Dissertation: Mimicking Leaflet Asymmetries and Lateral Heterogeneities in Plasma Membranes, a Supported Lipid Bilayer Study.

Advisor: Dr. Marjorie L. Longo.

Bachelor of Science, Physics, National Taiwan University, June 1999.

### AREAS OF SPECIALIZATION

**Atomic Force Microscopy:** Nano-scale surface imaging in both air and fluid environment, Surface physical properties analysis, Force measurements

**Fluorescent Techniques:** Confocal microscopy, Fluorescent microscopy, Fluorescence resonance energy transfer (FRET) spectroscopy, Total internal reflection fluorescent (TIRF) microscopy, Fluorescence recovery after photobleaching (FRAP) microscopy, Fluorescence correlation spectroscopy (FCS)

**Modern Optics:** Optics alignment, Image restoration, High power laser usage and maintaining, Photon counting, Digital data acquisition

**Macromolecular Assemblies:** Vesicles preparation (tip sonification, extrusion, electro formation and slow hydration formation), Supported lipid bilayer formation (vesicle fusion and Langmuir-Blodgett deposition)

### RESEARCH EXPERIENCE

**Postdoctoral Research,** Joint appointment with Groves Lab (PI: Dr. Jay Groves), Chemistry Department, University of California-Berkeley, Berkeley, CA and Longo Lab (PI: Dr. Marjorie Longo), Biophysics Graduate Group, University of California-Davis, Davis, CA. 06/2007 -Present.

- Use FCS to investigate lipid mobility modulation by charged lipids and metal cations

**Doctoral Research,** Longo Lab (PI: Dr. Marjorie Longo), Biophysics Graduate Group, University of California-Davis, Davis, CA. 09/2001 -12/2006.

- Designed suitable supported lipid bilayer platforms to study multivalent interaction of protein (HIV gp120)-ligand (GalCer) binding
- Used atomic force microscopy and various fluorescent techniques to study
  - Mechanisms of formation and stability of supported lipid bilayers
  - Transbilayer symmetry and its evolution
  - Phase behavior and the effect of cholesterol on liquid-solid coexisting and liquid-liquid coexisting supported lipid bilayers
  - Mechanisms of domain nucleation and growth in non-ideal mixing lipid bilayers
- Designed and built a total internal reflection fluorescence (TIRF) microscope

- Designed a single particle tracking system
- Safety coordinator
- Mentored visiting scholars and intern students

**Research Assistant**, High-Resolution Optical Fabrication and Microscopy Laboratory (PI: Dr. Chau-Hwang Lee), Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan. 07/1999 - 08/2001.

- Designed and built a differential confocal microscope
- Developed and built a non-interferometric optical profilometer without scanning mechanisms
- Measured the mechanical properties of bilayer lipid membranes
- Equipment manager
- Safety coordinator

**Research Assistant**, High-Field Physics and Ultra-fast Technology Laboratory (PI: Dr. Jyhpyng Wang), Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan. 07/1998 - 06/1999.

- Developed nanometer-resolution differential confocal microscopy
- Prepared lipid bilayer samples: black membranes and giant vesicles

## TEACHING EXPERIENCE

**Grader**, Membrane Biology, UC Davis, Spring 2006. Dr. Marjorie Longo. Biophysics Graduate Program.

**Mentor**, Summer Undergraduate Research Experiences Program, Center on Polymer Interfaces and Macromolecular Assemblies (CPIMA), Summer 2003, Summer 2004, Summer 2005.

- Designed summer project and advised student in everyday lab work.
- Performed equipments and safety training.
- Evaluated final reports.

## HONORS AND AWARDS

- Anthony Summer Research Award, UCD, summer 2004
- Earle C. Anthony Fellowship, UCD, 2002-2003 academic year
- Nonresident Tuition Fellowship for Junior Faculty, UCD, 2001-2003 academic year

## PUBLICATIONS

- C. D. Blanchette, **W.-C. Lin**, C. A. Orme, T. V. Ratto, and M. L. Longo, "Effects of Cholesterol on Interfacial Line Tension in Ternary Mixtures Containing Galactosylceramide," Submit to *Biophysical Journal Letter*.
- C. D. Blanchette, **W.-C. Lin**, C. A. Orme, T. V. Ratto, and M. L. Longo, "Using Nucleation Rates to Determine the Interfacial Line Tension of Symmetric and Asymmetric Lipid Bilayer Domains," *Langmuir*, in press 2007.

- **W.-C. Lin**, C. D. Blanchette, and M. L. Longo, "Fluid-Phase Chain Unsaturation Controlling Domain Microstructure and Phase in Ternary Lipid Bilayers Containing GalCer and Cholesterol," *Biophysical Journal* **92**: 2831-2841 (2007).
- **W.-C. Lin**, C. D. Blanchette, T. V. Ratto, and M. L. Longo, "Lipid domains in supported lipid bilayer for atomic force microscopy," invited in *Methods in Membrane Lipids*, editor A. Dopico, Humana Press, in press 2007.
- C. D. Blanchette, **W.-C. Lin**, T. V. Ratto, and M. L. Longo, "Galactosylceramide Domain Microstructure: Impact of Cholesterol and Nucleation/Growth Conditions," *Biophysical Journal* **90**: 4466-4478 (2006).
- **W.-C. Lin**, C. D. Blanchette, T. V. Ratto, and M. L. Longo, "Lipid Asymmetry in DLPC/DSPC-Supported Lipid Bilayers: A Combined AFM and Fluorescence Microscopy Study," *Biophysical Journal* **90**: 228-237 (2006).
- C.-H. Lee, H.-Y. Mong, and **W.-C. Lin**, "Non-Interferometric Wide-Field Optical Profilometry with Nanometer Depth Resolution," *Optics Letters* **27**, 1773 (2002).
- C.-H. Lee, **W.-C. Lin**, and J. Wang, "All-Optical Measurements of the Bending Rigidity of Lipid-Vesicle Membranes across Structural Phase Transitions," *Physical Review E* **64**, 020901(R) (2001).
- C.-H. Lee, **W.-C. Lin**, and J. Wang, "Using Differential Confocal Microscopy to Detect the Phase Transition of Lipid Vesicle Membranes," *Optical Engineering* **40**, 2077 (2001).

## PRESENTATIONS

### Invited Presentations

- Seminar presentation at Institute of Physics, Academia Sinica, Taiwan, 2006.  
"Mimicking Leaflet Asymmetries and Lateral Heterogeneities in Plasma Membranes, a Supported Lipid Bilayer Study."
- Seminar presentation at Graduate Institute of Biophysics, National Central University, Taiwan, 2006.  
"Mimicking Leaflet Asymmetries and Lateral Heterogeneities in Plasma Membranes, a Supported Lipid Bilayer Study."

### Abstracts and Presentations

- **W.-C. Lin**, C. D. Blanchette, and M. L. Longo, "Atomic Force Microscopy of Galactosylceramide Domains in Supported Lipid Bilayers Composed of Phospholipids and Cholesterol." Presented at *American Chemical Society Colloid and Surface Science Symposium*, 2006.
- C. D. Blanchette, **W.-C. Lin**, and M. L. Longo, "Nucleation and Growth of Symmetric and Asymmetric Solid Phase and Liquid-Ordered Phase Domains in Supported Lipid Bilayers." Presented at *American Chemical Society Colloid and Surface Science Symposium*, 2006.
- **W.-C. Lin**, C. D. Blanchette, and M. L. Longo, "Structure Mediated Multivalent Interaction between GalCer Microdomains and Gp120, an HIV Envelope Protein, a Supported Lipid Bilayer Study." Presented at *Biophysical Society Annual Meeting*, 2006.

- **W.-C. Lin**, C. D. Blanchette, and M. L. Longo, "Mimicking Nanometer-Scale Heterogeneity Using Gel-Liquid Coexisting Supported Lipid Bilayers." Presented at *Material Research Society Spring Meeting*, 2005.
- C. D. Blanchette, **W.-C. Lin**, T. V. Ratto and M. L. Longo, "Effects of Cholesterol on Galactosylceramide Domain Morphology and Membrane Binding Properties: a Combined Atomic Force Microscopy and Fluorescence Microscopy Study." Presented at *Material Research Society Spring Meeting*, 2005.
- **W.-C. Lin**, C. D. Blanchette, T. V. Ratto and M. L. Longo, "Transmembrane Coupling and Movement in Gel-Liquid Coexisting Supported Lipid Bilayers." Presented at *Biophysical Society Annual Meeting*, 2005.
- C. D. Blanchette, **W.-C. Lin**, T. V. Ratto and M. L. Longo, "Effects of Cholesterol on Galactosylceramide Domain Morphology and Membrane Binding Properties." Presented at *Biophysical Society Annual Meeting*, 2005.
- **W.-C. Lin**, C. D. Blanchette, and M. L. Longo, "Mimicking Nanometer-Scale Heterogeneity Using Gel-Liquid Coexisting Supported Lipid Bilayers." Presented at *American Chemical Society National Meeting*, 2005.
- C. D. Blanchette, **W.-C. Lin**, T. V. Ratto and M. L. Longo, "Cholesterols Ability to Modulate Galactosylceramide Domain Morphology and Binding Properties." Presented at *American Chemical Society National Meeting*, 2005.
- **W.-C. Lin**, C. D. Blanchette, and M. L. Longo, "Lipid Superposition and Transmembrane Movement in Gel-Liquid Coexisting Supported Lipid Bilayers, an AFM Study." Presented at *Biophysical Society Annual Meeting*, 2004.
- C. D. Blanchette, **W.-C. Lin**, and M. L. Longo, "Multivalent Interactions between Gp120, an HIV Envelope Glycoprotein, and Galactosylceramide (GalCer): A Combined Atomic Force Microscopy and Fluorescence Microscopy Study." Presented at *Biophysical Discussions: Probing Membrane Microdomains*, 2004.
- **W.-C. Lin**, C. D. Blanchette, and M. L. Longo, "Lipid Superposition and Transmembrane Movement in Gel-Liquid Coexisting Supported Lipid Bilayers, an AFM Study." Presented at *Biophysical Discussions: Probing Membrane Microdomains*, 2004.
- **W.-C. Lin** and M. L. Longo, "Glycosphingolipid Microdomains on Supported Lipid Bilayers, A Platform for Studying the Protein-Ligand Interaction Between HIV-1 Envelope Protein gp120 and Galactosyl Ceramide (GalCer)," Presented at *Center on Polymer Interfaces and Macromolecular Assemblies (CPIMA) Annual Forum*, 2003.
- C.-H. Lee and **W.-C. Lin**, "Non-Interferometric Wide-Field Optical Profilometry with Nanometer Depth Resolution." Presented at *Conference on Lasers and Electro-Optics*, 2002.
- C.-H. Lee, **W.-C. Lin**, and J. Wang, "Mechanical Aspects of Lipid-Bilayer Phase Transition Studied by Differential Confocal Microscopy." Presented at *Conference on Lasers and Electro-Optics*, 2001.
- C.-H. Lee, **W.-C. Lin**, and J. Wang, "Measuring the Bending Rigidity of Giant Unilamellar Liposomes with Differential Confocal Microscopy." Presented at *Conference on Lasers and Electro-Optics*, 2000.

- **W.-C. Lin**, C.-H. Lee, and J. Wang, "Using Differential Confocal Microscopy to Detect the Phase Transition of the Membranes of Giant Unilamellar Liposomes." Presented at *Photonics Taiwan*, 2000.

**ACADEMIC SERVICE**

**Vice President**, Student Association of College of Science, National Taiwan University, 1997-1999

**Vice President**, Student Association of Department of Physics, National Taiwan University, 1997-1998

**PROFESSIONAL MEMBERSHIPS**

- Biophysical Society
- American Chemical Society
- Materials Research Society