HUNG-WEN LI

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Assistant Professor, Department of Chemistry, McGill University

Faculty Member, McGill Institute of Advanced Materials, McGill University

Research Interests

Biophysics and biochemistry of proteins involved in DNA recombination and DNA repair; Single-molecule imaging, microscopy, spectroscopy and manipulation techniques.

Education / Training

Postdoc. Brandeis University, Biochemistry 2000 –
with Jeff Gelles

Single Molecule Studies of E. coli RecBCD Helicases in DNA Recombinational Repair,
- Applied optical tweezers methods to measure DNA helicases motion in high resolution.
- Developed single molecule fluorescence techniques to study DNA helicases.
- Modified single molecule methods to detect DNA motor movement in high resolution.
- Used biochemistry and molecular biology methods to study proteins-DNA interaction.

Ph.D. University of California at Berkeley, Chemistry 1995 – 2000
with Herbert L. Strauss

Molecular Interactions and Conformational Reorientation of Amino Acids and Fatty Acids,
- Constructed difference frequency lasers to study molecular vibration with tunable infrared wavelength.
- Applied modified FT-IR technique to study vibration of amino acids and fatty acids in condensed phases.
- Studied the dynamics and structure of hydrogen-bonded complex by using hole burning technique.
- Characterized molecular interactions in crystalline fatty acids by using vibration spectroscopy.

B.S. National Taiwan University, Chemistry 1989 – 1993
with Ta-Chau Chang

Picosecond Time-Resolved Vibrational Dynamics in Condensed Phases,
- Constructed custom-made laser systems to perform four-wave mixing Raman spectroscopy (CARS).
- Applied ultrafast (picosecond) laser spectroscopy to study molecular vibrations at low temperatures.
- Investigated vibrational relaxation and energy transfer pathways in crystalline states.

Fellowships and Awards

Damon Runyon Cancer Research Fund Postdoctoral Fellowship, Brandeis University, 2001– 2004
Coblentz Award, Coblentz Society, 1998.
Regents Fellowship, University of California at Berkeley, 1995.
Research Creativity Award, National Science Council, Taiwan, 1993.
Chinese Culture and Science Fellowships, National Taiwan University, 1992.

Publications (12)

1. Perkins, T. T., Li, H. -W., Dalal, R. V., Gelles, J. & Block, S. M. "Forward and Reverse Motion of Single RecBCD Molecules along DNA", *Biophysical J*, 86, 1640, **2004**.

2. Li, H. -W., Snyder, R. G. & Strauss, H. L. "Differences in the IR Methylene Rocking Bands between the Crystalline Fatty Acids and n-Alkanes: Frequencies, Intensities, and Correlation Splitting", *J. Phys. Chem. A, 108*, 6629, **2004**.

3. Li, H. -W. & Strauss, H. L. "Infrared Hole Burning of the Amino Group in Amino Acid and Peptide Salts", *J. Phys. Chem. B, 105*, 2250, **2001**.
4. Yu, G. S., Li, H. -W., Hollander, F., Snyder, R. G. & Strauss, H. L. "Comparsion of the Structure of Ammonium Myristate, Palmitate and Stearate by X-ray Diffraction, Infrared Spectroscopy and Infrared Hole Burning", *J. Phys. Chem. B, 103*, 10461, **1999**.
5. Li, H. -W., Yu, G. S. & Strauss, H. L. "The Vibrations of the Amino Group in Glycine Hydrochloride: Spectral Hole Burning and Isotope Shift", *J. Phys. Chem B, 102*, 298, **1998**.
6. Yu, G. S., Li, H. -W. & Strauss, H. L. "Persistent Infrared Hole Burning of Ammonium Stearate", *J. Phys. Chem. A, 101*, 8009, **1997**.
7. Yu, G. S., Li, H. -W. & Strauss, H. L. "Infrared Spectral Hole Burning and Change of Conformation in Simple Amino Acid Salts", *J. Phys. Chem. B, 101*, 5484, **1997**.
8. Fei, S. L., Yu, G. S., Li, H. -W. & Strauss, H. L. "Rotation of Ammonium Groups by Infrared Irradiation Far From Obvious Absorption", *J. Chem. Phys. 104*, 6398, **1996**.
9. Chang, T. C., Chou, S. H., Li, H. -W. & Lin, S. H. "Vibrational Relaxation of Bulk Modes Perturbed by Electronic State of Dilute Impurities", *J. Chem. Phys. 99*, 2781, **1993**.
10. Chang, T. C., Li, H. -W., Hsieh, T. C. & Chou, S. H. "Picosecond Time-Resolved CSRS Study of Vibrational Dephasing of Bulk Modes Perturbed by Electronic State of Dilute Impurities", *Chem. Phys. Lett. 213*, 564, **1993**.
11. Chang, T. C., Liu, T. Y., Wu, H. M. & Li, H. -W. "Multiplex Picosecond Coherent Stokes Raman Spectroscopy of Pentacene Doped in Naphthalene", *Chem. Phys. Lett. 197*, 476, **1992**.
12. Chang, T. C., Jou, B. H., Ou, R. S., Chiang, C. C. & Li, H. -W. "Temperature-Dependent Vibrational Relaxation in Isotopically Mixed Molecular Crystals by Picosecond CARS", *Chem. Phys. Lett. 187*, 208, **1991**.

Professional Presentations

- Department of Chemistry, Johns Hopkins University, 2004 (invited talk).
- Department of Chemistry, University of Southern California, 2004 (invited talk).
- Department of Chemistry, McGill University, 2004 (invited talk).
- Department of Biochemistry and Molecular Pharmacology, UMass Medical School, 2004 (invited talk).
- BioDesign Institute, Arizona State University, 2004 (invited talk).
- Department of Chemistry, University of Mass, 2003 (invited talk).
- Department of Chemistry, University of Arizona, 2003 (invited talk).
- Department of Chemistry, Iowa State University, 2003 (invited talk).
- FASEB Summer Research Conferences on "Helicases: Structure, Function and Roles in Human Disease", Saxtons River, VT, June 2003.
- 47th Biophysical Society Meeting, San Antonios, TX, March 2003.
- Institute of Chemistry, Academia Sinica, Taiwan, 2002 (invited talk).
- Federation of Analytical Chemistry and Spectroscopy Society Meeting, Vancouver, Canada, 1999.
- American Physical Society Meeting, Los Angeles, CA, March 1998.
- 213th American Chemical Society Meeting, San Francisco, CA, April 1997.