

JEN-CHIEN CHANG

jen-chien.chang@riken.jp

EDUCATION

- 2014 **Ph.D. in physics**, University of Maryland at College Park, MD, USA.
Thesis advisor: Arthur La Porta.
Thesis title: Development of single-molecule force and torque measurement with application to nucleosome disruption.
- 2007 **B.S. in physics**, National Taiwan University (NTU), Taipei, Taiwan.
- 2007 **Exchange student program**, University of Toronto, Toronto, Canada.

PROFESSIONAL EXPERIENCE

Research Assistant 2009 - 2013

Department of Physics, University of Maryland at College Park.

- Constructed optical traps. (optics, electronics and machining jobs involved.)
- Fabricated quartz cylinders for optical torque wrench using nanosphere lithography.
- Developed data acquisition and analysis program using LabVIEW, C, and MATLAB.
- Studied mechanical stability of nucleosome under force and torque.
- Studied DNA G-quadruplex disruption using dynamic force spectroscopy.
- Studied DNA hairpin kinetics measurement influenced by experimental setup.
- Studied RNA polymerase activity during transcription.
- Studied RNA pseudoknot disruption pathways.
- Studied molecular crowding effects in quadruplex.

Teaching Assistant 2008 - 2009

Department of Physics, University of Maryland at College Park.

Research Assistant 2005 - 2006

Laboratory of Statistical and Computational Physics, Institute of Physics, Academia Sinica, Taiwan.

Research topic: secondary structure prediction in protein folding simulation.

Advisors: Ming-Chya Wu and Chin-Kun Hu.

- Developed FORTRAN code to analyze nearest-neighbor correlation of DNA secondary structure data from PDB.

MILITARY SERVICES

Able Seaman, Engineering Department, R.O.C. Navy (2007 - 2008).

PUBLICATIONS

Ping-Chun Li*, **Jen-Chien Chang***, Arthur La Porta and Edward T. Yu, *Fabrication of birefringent nanocylinders for single-molecule force and torque measurement*, Nanotechnology **25**, 235304 (2014). (*Joint first author)

Michel de Messieres, **Jen-Chien Chang**, Ashton Trey Belew, Arturas Meskauskas, Jonathan D. Dinman and Arthur La Porta, *Single-molecule measurement of the CCR5 mRNA unfolding pathways*, Biophysical Journal **106**, 244 (2014).

Jen-Chien Chang, Michel de Messieres and Arthur La Porta, *Effect of handle length and microsphere size on transition kinetics in single-molecule experiments*, Physical Review E **87**, 012721 (2013).

Michel de Messieres, **Jen-Chien Chang**, Barbara Brawn-Cinani and Arthur La Porta, *Single-Molecule Study of G-Quadruplex Disruption Using Dynamic Force Spectroscopy*, Physical Review Letters **109**, 058101 (2012).

Jen-Chien Chang, Michel de Messieres, Max Kushner, Olga I. Kulaeva, Vasily M. Studitsky and Arthur La Porta, *Mechanical stability of single nucleosome revealed by optical torque wrench*, in preparation.

PRESENTATIONS

Jen-Chien Chang, Michel de Messieres, Ping-Chun Li, Olga I. Kulaeva, Vasily M. Studitsky, Edward T. Yu and Arthur La Porta, *Mechanical stability of mononucleosome revealed by optical torque wrench*, poster, Biophysical Society 57th Annual Meeting, Philadelphia, PA (2013).

Jen-Chien Chang, Michel de Messieres, Ping-Chun Li, Olga I. Kulaeva, Vasily M. Studitsky, Edward T. Yu and Arthur La Porta, *Mechanical stability of nucleosome revealed by optical torque wrench*, poster, Bioscience Day, University of Maryland (2012).

Jen-Chien Chang, Michel de Messieres, Olga I. Kulaeva, Vasily M. Studitsky and Arthur La Porta. *Single-molecule twist and stretch of mononucleosome using optical torque wrench*, poster, Biophysical Society 56th Annual Meeting, San Diego, CA (2012).

Michel de Messieres, **Jen-Chien Chang**, Ashton T. Belew, Arturas Meskauskas, Jonathan D. Dinman and Arthur La Porta, *Single-molecule optical trap study of human CCR5 mRNA structure*, poster, Biophysical Society 56th Annual Meeting, San Diego, CA (2012).

Jen-Chien Chang, Michel de Messieres and Arthur La Porta, *Using dynamic force spectroscopy to study G-quadruplex disruption*, poster, Biophysical Society 55th Annual Meeting, Baltimore, MD (2011).

Jen-Chien Chang, Michel de Messieres, Crystal Evans, Max Kushner, Maia Werbos and Arthur La Porta, *Single-molecule manipulation at IPST*, UMD-NCI workshop, Bethesda, MD (2011).

HONORS/AWARDS

Jacob K. Goldhaber Travel Award, UMD (2013).

International Conference Student Support Award, UMD (2013).

Dean's Award, NTU (2007).

Professor Yun-Guei Dai Scholarship, Department of Physics, NTU (2004 & 2005).

Presidential Award, NTU (2004 & 2005).

Professor Jen-Lin Huang Scholarship, Department of Physics, NTU (2004).

Bronze Medal, 4th Asian Physics Olympiad, Thailand (2003).

PROFESSIONAL ASSOCIATIONS

Member, Biophysical Society and American Physical Society.

SCIENCE COMMUNICATIONS / PUBLIC OUTREACH

Academic Counselor, 8th C.S. Wu Science Camp, Taiwan (2005).

Academic Counselor, 7th C.S. Wu Science Camp, Taiwan (2004).

LEADERSHIP

Finance Director, NTU Physics Student Society (2005 - 2006).

President, NTU Philharmonic Club (2004 - 2005).

LANGUAGE

English, Chinese, Japanese (JLPT N2).