Jun Wu

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SUMMARY

- PhD level cell bio-physicist, bio-engineer, chemical engineer and molecular biologist
- Productive, fast learning and meticulous researcher with excellent communication skills and leadership
- Extensive experience leading and mentoring graduate and undergraduate students

EDUCATION

Doctor of Philosophy, Chemical Engineering (focus on cell biophysics and engineering) 05/2012

University of Florida, Gainesville, FL GPA: 3.72/4.0

Dissertation: Molecular Motor Forces and Nuclear Positioning in Living Cells

Master of Science, Chemical Engineering 07/2007

Tianjin University, Tianjin, China GPA: 3.28/4.0

Thesis: Computational Fluid Dynamics Study of Melt Crystallization and Separation Process of p-Cresol

Bachelor of Science, Chemical Engineering and Technology 07/2005

Tianjin University, Tianjin, China GPA: 3.37/4.0

Undergraduate Honor Thesis: Preparation and Product Analysis of 1-Methyl-2-(3-Pentenyl)- Benzene

PROFESSIONAL EXPERIENCE

Postdoctoral Research Associate 10/2012 - present

Advisor: Dr. Deborah Leckband, Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign

- Applied traction force microscopy (TFM) and magnetic twisting cytometry (MTC) to study α-Catenin's role in cadherin-dependent adhesion and mechanotransduction
- Combined dynamic fluorescence imaging and mechanical measurements of living cells to study the role of vinculin in cell global mechanotransduction
- Study the signaling pathway of cross talk between cell-cell adhesion and cell-substrate adhesion (focal adhesion) involving PI3K, Src and Rho GTPase etc.
- Built a new magnetic twisting cytometry system

Graduate Assistant 08/2007- 10/2012

Advisor: Dr. Tanmay Lele, Chemical Engineering, University of Florida

- Used microscopy and developed imaging analysis method to statistically study nuclear rotation in mammalian cells and proposed a model based on force generation by dynein walking on dynamic microtubules drives nuclear rotation
- Applied femtosecond laser ablation to study microtubule mechanics and centrosome centering mechanism
- Designed experiments to investigate the mechanism of nuclear translation during mammalian cells migration
- Developed a new mathematical model for FRAP (fluorescence recover after photobleaching) analysis to study protein binding dynamics in live cells
- Improved the performance of a new wound-healing assay developed in our lab
- Trained and supervised master students and undergraduate students to work on scientific research, students trained have successfully entered medical school, pharmacy school and engineering programs
- Participated as a mentor in Ronald E. McNair Post-Baccalaureate Achievement Program

PROFESSIONAL EXPERIENCE CONT.'

Master Research 08/2005- 07/2007

Advisor: Dr. Xingang Li, Chemical Engineering, Tianjin University

- Designed experimental system and conducted simulation to study melting crystallization and separation of p-Cresol

Undergraduate Research 12/2004- 06/2005

Advisor: Dr. Jiaming Zheng, Chemical Technology, Tianjin University

- Conducted experiments to studies synthesis of 1-Methyl-2-(3-Pentenyl)-Benzene

Teaching Assistant

Advisor: Prof. Chang-Won Park, Chemical Engineering, University of Florida, Gainesville, FL 01-05/2011

- Taught Material and Energy Balances: process design using UNISIM

Advisor: Prof. Fan Ren and Ranga Narayanan, Chemical Engineering, University of Florida 08-12/2010

- Taught unit operation experiments: batch distillation, continuous distillation, liquid-liquid extraction, continuous filtration, thin film evaporator, heat exchanger, fluid flow

Research Assistant, GUIZHOU CHITIANHUA CO.LTD, Chishui, Guizhou, China, 07-08/2005

- Conducted the heat exchange calculation in Vapor System Energy Conservation Modification project

PUBLICATIONS

- Muhamed, I., **J. Wu**, X. Kong, A. Tajik, N. Wang, D.E. Leckband. Cadherin Mechanotransduction Alters Global Cell Mechanics through an Integrin-Dependent Pathway. (under review in *Current Biology*)
- Kim, T., S. Zheng, J. Sun, I. Muhamed, **J. Wu**, L. Lei, X. Kong, D. E. Leckband, and Y. Wang. Dynamic visualization of α-catenin reveals rapid, reversible conformation switching between tension states. *Current Biology (2015), http://dx.doi.org/10.1016/j.cub.2014.11.017*
- A.K. Barry, H. Tabdili, I. Muhamed, **J. Wu**, N. Shashikanth, G.A. Gomez, A.S. Yap, C.J. Gottardi, J. de Rooij, N. Wang, and D.E. Leckband. α-Catenin cytomechanics: role in cadherin-dependent adhesion and mechanotransduction. *Journal of Cell Science, 127(8), 1779–1791, 2014.* (co-first author, highlighted article)
- **Wu, J.**, Ian Kent, N. Shekhar, T.J. Chancellor, A. Mendonca, R.B. Dickinson and T.P. Lele. Actomyosin Advances the Nucleus in a Migrating Tissue Cell. *Biophysical Journal, 106(1): 7-15, 2014.*
- Shekhar, N., **J. Wu**, S. Neelam, A.J.C. Ladd, R.B. Dickinson, T.P. Lele. Fluctuating Motor Forces Bend Growing Microtubules. *Cellular and Molecular Bioengineering, 6(2): 120-129, 2013.* (outstanding cellular and molecular bioengineering papers at the 2012 BMES meeting)
- **Wu, J.,** N. Shekhar, R.B. Dickinson, T.P. Lele. Cytoplasmic Dynein: Tension Generation on Microtubules and the Nucleus. *Cellular and Molecular Bioengineering, 6(1): 74-81, 2013.*(invited review)
- **Wu, J.,** N. Shekhar, P.P. Lele, T.P. Lele. FRAP Analysis: Accounting for Bleaching during Image Capture. *PLoS ONE*, 7(8): e42854, 2012.
- **Wu, J,** R.B. Dickinson, T.P. Lele. Investigation of in vivo Microtubule and Stress Fiber Mechanics with Laser Ablation. *Integrative Biology, 4, 471–479, 2012.*
- **Wu, J.**, G. Misra, R.J. Russell, A.J.C. Ladd, T.P. Lele, R.B. Dickinson. Effects of Dynein on Microtubule Mechanics and Centrosome Positioning. *Molecular Biology of the Cell, vol. 22 no. 24: 4834-4841, 2011.*
- **Wu, J.**, K.C. Lee, R.B. Dickinson, T.P. Lele. How Dynein and Microtubules Rotate the Nucleus. *Journal of Cellular Physiology, 226: 2666-2674, 2011.* (Highlighted article)

CONFERENCE PRESENTATIONS

- **Wu, J.,** Adrienne K. Barry, Hamid Tabdili, Ismaeel Muhamed, Nitesh Shashikanth, Guillermo A. Gomez, Alpha S. Yap, Cara J. Gottardi, Johan de Rooij, Ning Wang, and Deborah Leckband. α-Catenin Cytomechanics: Role in Cadherin-Dependent Adhesion and Mechanotransduction *Biomedical Engineering Society Annual Meeting*. San Antonio, Texas, October 2014.
- **Wu, J.**, Ian Kent, N. Shekhar, T.J. Chancellor, A. Mendonca, R.B. Dickinson and T.P. Lele. Actomyosin tug-of-war advances the nucleus in a migrating tissue cell. *Poster session: Conventional Myosins. Annual Meeting of the American Society for Cell Biology. New Orleans, LA, December 2013.*
- **Wu, J**., N. Shekhar, G. Misra, R. J. Russell, A. J. C. Ladd, T. P. Lele, R. B. Dickinson. Effects of Motor Protein on Microtubule Mechanics. *Poster session: Dynein. Annual Meeting of the American Society for Cell Biology. San Francisco, California, December 2012.*
- **Wu, J.**, K. C. Lee, R. B. Dickinson, T. P. Lele. How Dynein and Microtubules Rotate the Nucleus in Fibroblasts. *Poster session: Dynein. Annual Meeting of the American Society for Cell Biology. San Francisco, California, December 2012.*
- **Wu, J.**, N. Shekhar, P. P. Lele, T.P. Lele. FRAP Analysis: Accounting for Bleaching during Image Capture. *Cellular and Molecular Engineering poster session. Biomedical Engineering Society Annual Meeting*. Atlanta, Georgia, October 2012.
- Shekhar N., **J. Wu**, Anthony Ladd, Tanmay Lele, Richard Dickinson. Effect of Microtubule Motors on Microtubule Mechanics in Living Cells. *Session Cell Mechanics I. Biomedical Engineering Society Annual Meeting*. Atlanta, Georgia, October 2012.
- **Wu, J.**, TJ Chancellor, Nandini Shekhar, Agnes Mendonca, Kyle Roux, Richard Dickinson and Tanmay Lele. Nuclear Mechanics in Crawling Cells. *Poster Session: Engineering Fundamentals In Life Science. American Institute of Chemical Engineering Annual Meeting.* Pittsburgh, Pennsylvania. October 2012.
- **Wu, J.**, K. C. Lee, R. B. Dickinson, T. P. Lele. How Dynein and Microtubules Rotate the Nucleus in Fibroblasts. *Poster session. ASME 2011 International Mechanical Engineering Congress & Exposition*. Denver, Colorado, November 2011.
- **Wu, J.**, G. Misra, R. J. Russell, A. J. C. Ladd, T. P. Lele, R. B. Dickinson. Effects of Dynein on Microtubule Mechanics and Centrosome Positioning. *Cellular and Molecular Engineering poster session. Biomedical Engineering Society Annual Meeting*. Hartford, Connecticut, October 2011.
- **Wu, J.**, K. C. Lee, R. B. Dickinson, T. P. Lele. Force Generation On the Nucleus by Dynein Walking On Dynamic Microtubules Is Sufficient to Explain Nuclear Rotation. *Cell Biomechanics session. American Institute of Chemical Engineering Annual Meeting.* Salt Lake City, Utah, November 2010.
- **Wu, J.**, K. C. Lee, R. B. Dickinson, T. P. Lele. Force Generation on the Nucleus by Dynein Walking on Dynamic Microtubules is Sufficient to Explain Nuclear Rotation. *Cellular and Molecular Engineering poster session. Biomedical Engineering Society Annual Meeting*. Austin, Texas, October 2010.

SKILLS AND CERTIFICATES

- Expert in mammalian cell culture and proficient in molecular biology methods including protein expression, transfection, immunocytochemistry, FRET, western blot, plasmid midi-prep, siRNA gene knockout, spectrophotometry, electrophoresis, flow cytometry. Familiar with SPR, SDS-PAGE, PCR, cloning, protein purification and FACS
- Expert in optical live cell imaging techniques including epi-fluorescent, confocal, multi-photon and TIRF microscopy
- Proficient in MATLAB programming for imaging analysis, imaging processing and statistical analysis

SKILLS AND CERTIFICATES CONT.'

- Expert in FRAP, nano-surgery and protein photo-activation using confocal microscope
- Expert in traction force microscopy (TFM) and magnetic twisting cytometry (MTC)
- Proficient in protein conjugation, photolithography and experienced in chemical surface modifications to control cellular behavior including microcontact printing
- Experience with biomaterials to modulate cellular response including polymers, polymer based hydrogels and nanomaterials
- Familiar with processing engineering software including PRO/II, UNISIM, HYSYS and FLUENT software for CFD (computational fluid dynamics) simulation.
- GIBCO® Cell Culture Basics Certificate

HONORS

- Named the *Shen Postdoctoral Fellow* for 2015, Department of Chemical and Biomolecular Engineering, University of Illinois at Urbana-Champaign 07/2014
- Outstanding Paper Award, *2012 Biomedical Engineering Society Annual Meeting* 10/2012
- Research on "Microtubule Mechanics and Centrosome Positioning" highlighted on *Explore* magazine (Research at the University of Florida) 04/2012
- Graduate Publication Award. Department of Chemical Engineering, University of Florida 05/2012
- Image of microtubules in a micro-patterned cell selected to *ibidi* calendar 2012 10/2011
- Article "How Dynein and Microtubules Rotate the Nucleus" highlighted in *Journal of Cellular Physiology* 10/2011
- NSF Travel Award. *ASME 2011 International Mechanical Engineering Congress & Exposition* 10/2011
- Best presentation Award. *12th Chemical Engineering Graduate Symposium*, University of Florida 02/2011

PROFESSIONAL MEMBERSHIPS AND LEADERSHIP

- Biomedical Engineering Society 2010 – present
- President, Society of Postdoctoral Scholars at UIUC 06/2014 – present