Jingyi Liang, Ph.D.

Department of Pharmacy
Faculty of Health Sciences
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Research Interests

My general research interests are modeling and simulation of biological reactions/systems and mathematical and statistical analyses. Currently, I focus on developing mathematical models to improve our understanding of drug action in bacterial infections. I am interested in using modeling approaches to identify the relationship between chemical reaction kinetics of antibiotic-target binding and the dynamics of bacterial populations in patients, and thus, to predict optimal dosing regimens for trials of new drugs and preventing relapse.

Education

PhD in Computational Systems Biology **2012 - 2017**
Thesis: Modelling and investigation of NMDAR-mediated Calcium signaling at Hippocampal Dendritic Spine in Alzheimer's disease
Lincoln University, New Zealand

Postgraduate Diploma in Applied Science with Distinction **2011**
Lincoln University, New Zealand

Bachelor of Engineering in Biological Engineering **2004 - 2008**
Dissertation: Comparison of three DNA Extraction Methods for the Detection of Porcine Parvovirus from Boar Semen
Henan Agricultural University, Zhengzhou city, China

Bachelor of Engineering in Computer Science and Technology **2005 - 2008**
Dissertation: The research on Search Function of Search Engine and PageRank
Henan Agricultural University, Zhengzhou city, China

Research and Teaching Experience

Post doctor at the Department of Pharmacy **2018 – present**

University of Tromsø, Norway

- The project focus on developing mathematical models that improve our understanding of drug action in bacterial infections

Teaching assistant and tutor at course COMP 308: Computer Modelling and Simulation **2014 - 2017**

Lincoln University, New Zealand

- Weekly computer labs and tutorial lectures
- Designed and marked assignments and final project
- Administered grades
- Demonstrated and helped students develop and analyze various systems using computer modelling techniques, and met with students upon request

Research Assistant **2013 - 2017**

Lincoln University, New Zealand

Assisted Prof. Don Kulasiri on various research projects, including stochastic modeling of synaptic transmission and synaptic plasticity, model reduction of large biochemical systems using global sensitivity analysis, and simulation of entropy production during synaptic transmission.

- Developed mathematical models based on biological mechanisms and theories
- Designed and conducted computational experiments
- Managed large datasets and maintained project records
- Prepared and interpreted research results for publications

Head of Department (HOD) Support **2016**

Lincoln University, New Zealand

- Assisted HOD to conduct research
- Discussed and guided postgraduate students to solve their research problems
- Assisted postgraduate students in programming

Publications

- **Liang, J.**, & Kulasiri, D. (2018). What can computational modeling offer for studying the Ca2+ dysregulation in Alzheimer's disease: current research and future directions. *Neural regeneration research, 13*(7), 1156.
- **Liang, J.**, Kulasiri, D., & Samarasinghe, S. (2017). Computational investigation of Amyloid-β-induced location-and subunit-specific disturbances of NMDAR at hippocampal dendritic spine in Alzheimer's disease. *PLOS ONE, 12*(8), e0182743.
- Kulasiri, D., **Liang, J**., He, Y., & Samarasinghe, S. (2017). Global sensitivity analysis of a model related to memory formation in synapses: Model reduction based on epistemic parameter uncertainties and related issues. *Journal of Theoretical Biology, 419,* 116-136.

- **Liang, J**., Kulasiri, D., & Samarasinghe, S. (2015). Ca^{2+} dysregulation in the endoplasmic reticulum related to Alzheimer's disease: a review on experimental progress and computational modelling. *Biosystems, 134,* 1-15.
- He, Y., Kulasiri, D., & **Liang, J**. (2018). A mathematical and computational study of Synaptotagmin 7 revealing functional importance of short-term plasticity. *Neural regeneration research.* (In press).

Conference presentation:

- "Computational Modelling of Apoptosis Signalling and Inspiration for Alzheimer's disease Research", presented at the BIT's 4th World DNA and Genome Day, Nanjing, China. April 26, 2013.
- "Mathematical modelling on Aβ-induced neuronal calcium dysregulation in Alzheimer's disease", Presentation at the Postgraduate Conference, Lincoln University, Christchurch, New Zealand. August 28, 2013.

Scholarships / Awards

- Lincoln University Doctoral Scholarship, $21,000 NZD per year, 2013-2015
- Research Writing Scholarships, Lincoln University, $2,000 NZD, 2016

Professional Skills Training

- Awarded a certificate for successful completion of the Enterprise & Innovation Workshops, held at Lincoln University, 2017
- Effective Tertiary Teaching workshop, held at Lincoln University, 2017

Additional Employment

Pastoral Care Officer of New Zealand Institute of Business and Technology 2016 - 2017

- Provided exceptional supports to ensure students successfully adjust to life and study
- Developed, coordinated and delivered the orientation programs for new students
- Conducted workshops for students on referencing, presentation and other research skills
- Provided and facilitated services that enhance the social and cultural welfare of students
- Formed strong and productive relationships with students, agents, Lincoln University and community
- Translated the international prospectus for recruitment in China

Other

Member of Lincoln University Chinese Association 2012

- Participated in club orientation
- Organized activities for new Chinese students