

Richard W. Tourdot

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EDUCATION

PhD. Chemical and Biomolecular Engineering, *University of Pennsylvania, Philadelphia, PA* Fall 2015

B.ChE. Chemical Engineering, *University of Minnesota, Minneapolis, MN* Spring 2010

RESEARCH/WORK EXPERIENCE

Postdoc: Physical Sciences-Oncology Group, *University of Pennsylvania, Philadelphia, PA* Fall 2015 –

- Utilized machine learning and image processing algorithms to analyze liver histology stains.
- Quantified single cell pressure in normal and disease states such as liver stiffening in cirrhosis in order to determine the forces on each cells plasma membrane.

PhD Research: Membrane Biophysics, *University of Pennsylvania, Philadelphia, PA* Fall 2010 – Fall 2015

- Thesis Advisor: Ravi Radhakrishnan
- Dissertation Title: Defining the Free Energy Landscape for Protein Induced Cell Membrane Curvature
- Created a computational membrane model and applied statistical mechanics based sampling methods in order to investigate membrane morphological transitions including endocytosis and membrane tubulation
- Used both theory and simulation to categorized the tension dependence of membrane tubulation and matched to experiments.
- Involved in highly interdisciplinary research drawing upon collaborations with physicians, cell biologists, chemists, and physicists.

Undergraduate Research: DNA, *University of Minnesota, Minneapolis, MN* Fall 2009 – Fall 2010

- Advisor: Kevin Dorfman
- Studied emergent secondary structure of oligomeric DNA with a coarse grained computational model
- Developed a coarse potential to describe hydrogen bonding of DNA base pairs beyond Watson-Crick (Hoogsteen base pairs) which is cited in other Coarse Grained models for DNA

Technical Aide, *3M Corporation, St Paul, MN* Spring 2008 – Fall 2009

- Worked in the Occupational Health and Environmental Safety division developing respirator products
- Helped develop an organic vapor sensor to be used in respirators to notify of replacement

SELECTED PUBLICATIONS

Tourdot R.W., Ramakrishnan N., Baumgart T., and Radhakrishnan R. (2015). Application of a Free Energy Landscape Approach to Study Tension Dependent Bilayer Tubulation Mediated by Curvature Inducing Proteins. *Phys. Rev. E.*, 92 042715.

Tourdot R.W., Ramakrishnan N., and Radhakrishnan R. (2014). Defining the free-energy landscape of curvature-inducing proteins on membrane bilayers. *Phys. Rev. E.*, 90 022717.

TECHNICAL EXPERIENCE

Languages and Packages: C & C++, Fortran, Python, Ruby, R, Perl, BASH, Cluster Computing, Parallel Computing (MPI, OpenMP), scikit-learn, samtools, FFT

Computational Software: MATLAB, Mathematica, Paraview, Pymol, VMD, Chimera, Clustal

Biology Wet Lab: some experience with Western Blot, PCR, Plasmid Purification, and DNA Sequencing

LEADERSHIP AND SUMMER PROGRAMS

IAS / Park City Mathematics Institute - Graduate Summer School, *PCMI, Park City, UT* July 2014

- Mathematics and Materials theme, workshop on the statistical mechanics of materials.

Summer Academy in Applied Science and Technology, *UPenn, Philadelphia, PA* July 2011-2013

- Mentored high school students as they developed cutting edge research projects in biotechnology