

## Ryan A. Tasseff

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### CONTACT INFORMATION

Institute for Systems Biology  
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### RESEARCH INTERESTS

Computational biology and nonlinear dynamics of complex systems. Strong focus on problems relevant to human health and practical integration of experimental and computational/ data-driven, techniques; interest in active collaboration with experimental molecular cell biology groups and industry.

### EDUCATION

**Cornell University**, Ithaca, New York USA

Ph.D. Chemical and Biomolecular Engineering, June 2011

- Dissertation Topic: "Reconstruction and Analysis of the Molecular Programs Involved in Deciding Mammalian Cell Fate"
- Concentrations: Computational Science and Engineering, Comparative Biomedical Sciences and Statistical Mechanics
- Advisor/ Committee Chair: Jeffrey D. Varner

**University of Florida**, Gainesville, Florida USA

B.S., Chemical Engineering, June, 2006

- Minor in Mathematics and Advanced Option in Physical Chemistry

### HONORS AND AWARDS

Edna and William C. Hooey Fellowship, Cornell University 2011

National Science Foundation IGERT Fellowship in Nonlinear Dynamics, Cornell University 2008

Graduated Magna Cum Laude, Honors in Chemical Engineering, University of Florida, 2006

University Scholars Research Grant and Best Undergraduate Paper, University of Florida, 2005

Florida Bright Futures Award for 100% paid tuition, 2001

### ACADEMIC EXPERIENCE

**Institute for Systems Biology**, Seattle, WA USA

**2011 - present**

*Postdoctoral research on computational systems biology*

Involved in computational research for ISB-Procter and Gamble (P&G) collaboration. Primary goal: integration of systems biology methods with current research pipelines at P&G related to Epithelial biology.

Worked directly with P&G biologist to formulate measures for systematic identification of biomarkers and therapeutic targets. Integration of high-throughput data and pre-existing knowledge. Identified marker sets to track the progression of inflammatory skin diseases. Identified and currently validating targets for modulation of hair growth.

Developing a general framework for the nonlinear dynamic analysis of periodic systems. Applied coupled oscillator model to capture aspects of hair cycle expression patterns. Predicted general features of multiple cell populations and possible interactions within the hair follicle.

Developing an *in silico* skin platform for assisting experimental investigation. Applying multi-scale, agent-based modeling techniques. Leveraging existing model descriptions and combining with in-house, high performance computing frameworks. Focused on scalability, quantification, and generalization to other systems.

Involved in bioinformatics research for ISB-INOVA health care system collaboration. Massive full genome sequencing project for identifying genetic predisposal to preterm birth. Assisted in standard bioinformatics analysis. Developed and applied dissimilarity measures for identifying associated genetic regions.

**Cornell University**, Ithaca, New York USA

**2006 - 2011**

*Ph.D. research on computational and experimental molecular cell biology.*

Constructed and analyzed mechanistic mathematical models of biomolecular interaction networks. Networks associated with prostate cancer and hematopoietic GM precursor cells revealed robust yet fragile subnetworks relating to the cellular infrastructure. Employed both experimental and computational techniques to characterize a feedback control circuit in programed differentiation. Experimentally correlated activity and inhibition of a critical subsystem to molecular and phenotypic events and computationally uncovered dynamic properties of cell differentiation.

- Completed both computational and experimental research in cell biology
- Advisor and team leader for 30+ undergraduate/Masters/PhD research projects
- Designed, organized and maintained the departments shared mammalian cell culture facility

*Instructed Course for Masters of Engineering program.*

- Novel Masters Program: Medical and Industrial Biotechnology
- CHEME 5490, MIB Molecular Biology Lab
- Designed the curriculum for Mammalian Cell Culture

*Teaching Assistant*

- CHEME 2880, Biomolecular Engineering: Fundamentals and Applications

## INDUSTRY EXPERIENCE

**Cornell / General Electric**, Albany, New York USA

**2008 and 2009**

*Cornell Business of Science and Technology Initiative member* Consulted with General Electric on an analysis of a full supply chain model of fuel production from renewable biomass. My primary task was to develop software for processing large amounts of data from multiple sources in multiple formats for cost and availability estimates, and to merge various modeling sub-modules into a single package for estimating profits from ventures into woody biomass gasification.

**University of Florida / Progress Energy**, Crystal River, Florida USA

**2005 - 2006**

*Integrated Product and Process Design Member* Consulted with Progress Energy to model power generator cooling operations. My primary task was to create algorithms and code for the physical modeling aspects. I also assisted with development of the artificial neural network architecture for statistical inference and GUI design. Modeling strategies were combine to produce real-time predictions for proper and environmentally safe operations of cooling process.

**Dow Chemical Company**, USA *Rotating Cooperative*

**2003 - 2004**

Computational design of distillation columns and separations processes in Freeport, TX.  
Research and development of pharmaceutical soluble polymers in Plaquemine, LA.  
Process control and optimization in Pittsburg, CA.

## SKILLS

- Programming languages: proficient in Python, basic skills in Java, Fortran and C++, some use of Unix shell scripts
- Mathematical platforms: Matlab, Octave, R and Aspen
- Operating Systems: Mac OSX, Linux, Windows.
- Experience with cloud/commodity computing (Amazon EC2)
- Mammalian cell culture techniques
- Biochemical techniques: Fluorescence Activated Cell Sorting, cytometry, cloning, immunochem.
- Familiarity with high-throughput data (mRNA microarray, full genome sequencing)

## PUBLICATIONS

**Ryan Tasseff**, Satyaprakash Nayak, Sang Ok Song, Andrew Yen and Jeffrey Varner. 2011. Modeling and Analysis of Differentiation Program of a model Adult Hematopoietic Stem Cell Line, HL-60. *Integrative Biology*, DOI: 10.1039/c0ib00141d..

Young-Min Ban, **Ryan A Tasseff**, and Dmitry I. Kopelevich. 2011. Non-adiabatic Dynamics of Interfacial Systems: A Case Study of a Nanoparticle Penetration into a Lipid Bilayer. *Molecular Simulation*, 37(7) 525-536.

**Ryan A. Tasseff**, and Jeffrey D. Varner. 2011. Mathematical Models in Biotechnology. *Comprehensive Biotechnology*, 2nd edition ISBN: 9780444533524

Timon H. Stasko, Robert J. Conrado, Andreas Wankerl, Rodrigo Labatut, **Ryan Tasseff**, et al. 2010. Mapping Woody-Biomass Supply Costs Using Forest Inventory and Competing Industry Data. *Biomass and Bioenergy*. doi:10.1016/j.biombioe.2010.08.044

Reiterer G, Chen L, **Tasseff R**, Varner JD, Chen CY and Yen A. 2010. Raf associates with phosphorylated nuclear BubR1 during endoreduplication induced by JAK inhibition. *Cell Cycle* 9(16):3297-304

**Tasseff R**, Nayak S, Salim S, et al. 2010. Analysis of the Molecular Networks in Androgen Dependent and Independent Prostate Cancer Revealed Fragile and Robust Subsystems. *PLoS ONE* 5(1): e8864. doi:10.1371/journal.pone.0008864

Dmitry I. Kopelevich, Jean-Claude Bonzongo, **Ryan A. Tasseff**, et al. 2008. Potential Toxicity of Fullerenes and Molecular Modeling of Their Transport across Lipid Membranes. *Nanoscience and Nanotechnology*:233-260. Copy Right John Wiley & Sons, Inc.

**Ryan Tasseff**, Dr. Dmitry Kopelevich. 2006. Molecular Modeling of Nanoparticle Transport across Lipid Bilayers. *University of Florida: Journal of Undergraduate Research* 7(4)

Holly A. Jensen, Lauren E. Styskal, **Ryan Tasseff**, et al. 2013 The Src-family kinase inhibitor PP2 Rescues Early Inducible Differentiation Events in Emergent Retinoic Acid-Resistant Myeloblastic Leukemia Cells. *PLoS ONE* 8(3):e58621. doi:10.1371/journal.pone.0058621

## PAPERS IN PREPARATION

**Ryan Tasseff** and Ilya Shmulevich. Spontaneous Synchronization of Oscillators Describes Aspects of Hair Cycle Gene Expression. *Mol Syst Biol*.

**Ryan Tasseff**, Johanna Congleton, Andrew Yen and Jeffrey D. Varner. Investigation of the cRaf interactome and steady-state multiplicity in Retinoic Acid-Induced Differentiation of HL-60 cells. *Biophys J*.

## CONFERENCE PRESENTATIONS

SBE International Conference on Biomolecular Engineering 2011, San Fransisco, CA (poster)  
Modeling and Analysis of the Retinoic Acid Induced Proliferation and Differentiation Program of HL-60. **Ryan Tasseff**, Satyaprakash Nayak, Sang Ok Song, Andrew Yen and Jeffrey D. Varner.

AICHE Annual Meeting 2010, Salt Lake City, UT - In Silico Biology (oral)  
Modeling and Analysis of the Retinoic Acid Induced Proliferation and Differentiation Program of HL-60. **Ryan Tasseff**, Satyaprakash Nayak, Sang Ok Song, Andrew Yen and Jeffrey D. Varner.

ACS National Meeting 2010, San Francisco, CA - Biotechnology (poster)  
Modeling and Analysis of the Retinoic Acid Induced Proliferation and Differentiation Program of HL-60. **Ryan Tasseff**, Satyaprakash Nayak, Sang Ok Song, Andrew Yen and Jeffrey D. Varner.

AICHE Annual Meeting 2008, Philadelphia, PA - Systems Biotechnology II (oral)  
Mathematical Modeling and Analysis of the Role of the BLR1 Protein and MAPK Activation in the Growth-Arrest and Differentiation Program of a Model Adult Stem-Cell. Jeffrey D. Varner, **Ryan Tasseff**, Satyaprakash Nayak and Andrew Yen.

AICHE Annual Meeting 2008, Philadelphia, PA - Engineering Life Sciences (poster)  
Formulation and Analysis of An Ultrascale Protein Interaction Network Involved In the Androgen Response of Prostate Cancer Epithelial Cells. **Ryan A. Tasseff**, Satyaprakash Nayak, Poorvi Kaushia, Noreen Rizvi, Saniya Salim, Jeffrey D. Varner.

AICHE Annual Meeting 2007, Salt Lake City, UT - Bioengineering (poster)  
Identification of Fragile Mechanisms in the Human Complement Cascade Is Sensitive to the Choice of Numerical Method for the Solution of the Sensitivity Equations. **Ryan A. Tasseff**, Jeffrey D. Varner, Satyaprakash Nayak, Thomas J. Mansell, Deyan Luan.

AICHE Annual Meeting 2005, Cincinnati, OH - Transport in Nanoscale (oral)  
Modeling of Transport of Nanoparticles across a Lipid Bilayer. **Ryan A. Tasseff** and Dmitry I. Kopelevich.

OTHER

Peer Reviewer for Oxford Journal, *Bioinformatics*