BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	POSITION TITLE
Elston, Timothy Charles	Associate Professor of Pharmacology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Georgia Institute of Technology	B. S.	1988	Physics
Georgia Institute of Technology	Ph. D.	1993	Physics

A. Positions and Honors

Positions and Employment

1994-1996 Postdoctoral Fellow, The Center for Nonlinear Studies, Los Alamos National Laboratory
1996-1997 Visiting Scholar, Department of Molecular and Cell Biology, University of California, Berkeley
1997-1998 Assistant Professor, Department of Physics, DePaul University
1998-2002 Assistant Professor, Department of Statistics, North Carolina State University
2001-2002 Director of the Graduate Program, Biomathematics Graduate Program, North Carolina State University
2002-2005 Associate Professor, Department of Mathematics, University of North Carolina at Chapel Hill
2005- Associate Professor, Department of Pharmacology, University of North Carolina at Chapel Hill
2006- Director of the Graduate Program in Bioinformatics and Computational Biology, University of North Carolina at Chapel Hill

Editorial Boards

2006- Journal Theoretical Biology
2005- Mathematical Medicine and Biology

Professional Memberships

1990 Member, American Physical Society
1996 Member, Biophysical Society
1998 Member, Society of Mathematical Biology

B. Selected Peer-Reviewed Publications

1. Elston, T. and G. Oster. 1997. Protein turbines I: the bacterial flagellar motor. *Biophys. J.* 73, 703-721.
2. Glick, B., T. Elston and G. Oster. 1997. Cisternal maturation can explain the asymmetry of the golgi stack. *FEBS Letters.* 414:177-181.

3. Wang, H., T. Elston, A. Mogilner and G. Oster. 1998. Force production in RNA polymerase. *Biophys. J*. 74:1186-1202.
4. Elston, T., H. Wang and G. Oster. 1998. Energy transduction in ATP synthase. *Nature* 391:510-513.
5. Elston, T., and C. Peskin. 2000. The role of protein flexibility in molecular motor function: coupled diffusion in a tilted periodic potential. *SIAM.* 60: 842-867.
6. Elston, T., D. You and C. Peskin. 2000. Protein flexibility and the correlation ratchet. *SIAM.* 61:776-791.
7. Elston, T. 2000. A macroscopic description of biomolecular transport. *J*. *Math*. *Biol*. 41:189-206.
8. Elston, T. 2000. Models of post-translational protein translocation. *Biophys*. *J*. 79:2235-2251.
9. Elston, T. and T. Kepler. 2001. A linear two-state model with complex dynamics. *PLA*., 280:204-208.
10. T. Kepler and T. Elston. 2001. Stochasticity in transcriptional regulation: origins, consequences, and mathematical representations. *Biophys. J.* 81:3116-3136.
11. T. Elston. 2002. The Brownian ratchet and power stroke models of post-translational translocation into the endoplasmic reticulum *Biophys. J.* 82:1239-1253.
12. Wang, H., C. Peskin and T. Elston. 2003. A robust numerical algorithm for studying energy transduction in motor proteins. *J. Theor. Biol*., 221:491-511.
13. Morgan, K., W. Casey, M. Easton, D. Creech, H. Ni, L. Yoon, S. Anderson, C. Qualls, L. Crosby, P. Bloomfield, A. MacPherson, and T. Elston. 2003. Frequent Sampling Reveals Dynamic Responses by the Transcriptome to Routine Media Replacement in HepG2 Cells. *Tox. Path.*, 31:448-461.
14. Hao, N., Yildirim, N. Wang, Y., Elston, T., and Dohlman, H. G. 2003. Regulators of G protein signaling and transient activation of signaling: Experimental and computation analysis reveals negative and positive feedback controls on G protein activity. *J. Biol. Chem*., 278:46506-46515.
15. Pirone, J. and T. Elston. 2004 Fluctuations in transcription factor binding can explain the graded and binary responses observed in inducible gene expression. *J. Theor. Biol*., 226:111-121.
16. Adalsteinsson, D., D. McMillen, and T. Elston. 2004. Biochemical Network Stochastic Simulator (BioNetS): software for stochastic modeling of biochemical networks. *BMC Bioinformatics* 5:2-37.
17. Yildirim, N. N. Hao, H. Dohlman, and T. Elston. 2004. Mathematical Modeling of RGS and G Protein Regulation in Yeast. *Mehtods Enzomol.*, 389:383-398.
18. Goedecke, M., and T. Elston. 2005. A mechanism for the oscillatory behavior of single dynein molecules. *J. Theor. Biol*., 232:27-39.
19. Kaern, M., W. Blake, T. Elston, and J. Collins. 2005. Stochasticity in gene expression: from theories to phenotypes. *Nat. Rev. Gen*., 6:451-64.
20. Fricks, J., H. Wang, and T. Elston. 2005. A numerical algorithm for investigating the role of the motor-cargo linkage in molecular motor driven transport. *J. Theor. Biol.*, 239:33-48.
21. Wang, X., N. Hao, H. Dohlman and T. Elston. 2005. Bistability, Stochasticity and Oscillations in the Mitogen Activated Protein Kinase Cascade. *Biophys. J.*, 90:1961-1978.
22. Guido, N., X. Wang, D. Adalsteinsson, D. McMillen, J. Hasty, T. Elston, and J. J. Collins. 2005. A bottom-up approach to gene expression. *Nature*, 439:856-860.
23. Erban, R., D. Adalsteinsson, I. G. Keverkidis, T. Elston. 2005. Gene regulatory networks: a course-grained, equation-free approach to multiscale computation. *J. Chem. Phys.* (in press).

C. Research Support

Ongoing Research Support

R01-GM078994-01 Elston (PI) 4/1/2006-3/31/2010
NIH/NIGMS
Cytoskeletal Oscillations: Mathematical Modeling Integrated with Experiment
The goal of this project is to discover the mechanism that underlies cytoskeletal oscillations. This will be accomplished by developing a mathematical model that couples the biochemical network that regulates actin-dependent contractility to force generation by myosin.

R01-GM073180 Dohlman, H. (PI) 4/1/2005-3/31/2009
NIH/NIGMS
Mathematical and Experimental Analysis of Feedback Regulation in the Pheromone Response Pathway of Yeast
This project is to understand the biochemical mechanisms that mediate the graded to binary response observed in the pheromone response pathway of yeast.
Role: Co-Investigator

Completed Research Support

DMS-0242543 Elston (PI) 8/15/2000-10/15/2004
NSF
Modeling Biomolecular Transport Processes
The goal of this project was to develop theoretical models to understand energy transduction in biomolecular motors.
Role: PI

F30602-01-2-0579 Collins, J. (PI) 9/1/2001-9/1/2003
DARPA
Stochastic Fluctuations in Gene Regulation
The goals of this project were to develop software for stochastic modeling of genetic regulatory networks and to conduct theoretical investigations into the effects of biochemical fluctuations in gene expression.
Role: Co-Investigator

F30602-01-2-0579 Elston (PI) 9/1/2003-9/1/2005
DARPA
Stochastic Fluctuations in Gene Regulation
The goals of this project are to develop software for stochastic modeling of genetic regulatory networks and to conduct theoretical investigations into the effects of biochemical fluctuations in gene expression.
Role: PI