

ROSEMARY IRENE BRAUN, PH.D.

Laboratory of Population Genetics, National Cancer Institute, NIH
2115 E. Jefferson St, Rm 6053, Bethesda, MD 20892

Phone: +1 (301) 594-3588
Email: braunr@mail.nih.gov

EDUCATION

M.P.H.

Johns Hopkins–Bloomberg School of Public Health 2006

Concentration in Biostatistics

Thesis: *Identifying Differentially Expressed Gene–Pathway Combinations*

Advisor: Prof. G. Parmigiani, Biostatistics

Ph.D., Physics

University of Illinois, Urbana–Champaign 2004

Dissertation: *Molecular Dynamics Studies of Interfacial Effects on Protein Conformation*

Advisor: Prof. K. Schulten, Physics

B.Sc., Physics

Stony Brook University (SUNY Stony Brook) 1996

Honors College Graduate

Thesis: *Binary Pulsar Evolution*

Advisor: Prof G. E. Brown, Physics

RESEARCH EXPERIENCE

National Cancer Institute, National Institutes of Health

Postdoctoral Fellow, Cancer Research Training Award 7/2009–Present

Postdoctoral Fellow, Cancer Prevention Fellowship Program 7/2005–7/2009

Developed, implemented, and tested novel biostatistical methods for the analysis of high-throughput genomic data, including mRNA and miRNA expression and SNP array data. Work was done in collaboration with Johns Hopkins–Bloomberg School of Public Health (2005–6), NCI Laboratory of Human Carcinogenesis (2006–7), and in the NCI Laboratory of Population Genetics (2007–present).

University of Illinois, Urbana-Champaign (UIUC)

Postdoctoral Research Associate, Physics Department 7/2004–7/2005

Investigated the gas migration pathways through myoglobin using computational biophysics techniques (molecular dynamics); authored tutorial material based on myoglobin simulations and taught workshops based on the tutorial material. Contributed to successful grant applications.

Graduate Research Assistant, Physics Department 8/1997–6/2004

Investigated the interaction of biologically-active molecules using computational biophysics techniques (molecular dynamics) including simulation of helix-helix interactions, micelle formation, and interaction of protein with metal surfaces; developed physical and mathematical models to characterize the simulation results. Contributed to successful grant applications.

ROSEMARY IRENE BRAUN, PH.D.

Stony Brook University (SUNY Stony Brook)

Undergraduate Research Assistant, Physics Department

8/1994–12/1995

Investigated the evolution of the dynamics of binary pulsar star systems through the development and execution of computer simulations.

TEACHING

Foundation for Advanced Education in the Sciences Graduate School, NIH

Instructor, Calculus

2009–2010

Developed course material and instructed introductory calculus. (FAES Graduate School courses are certified by the Maryland Higher Education Committee.)

National Institutes of Health

Computational Biophysics Workshop

2007

Tested hands-on workshop material; facilitated and taught hands-on workshop sessions.

University of Illinois, Urbana-Champaign (UIUC)

Computational Biology Summer School

2003

Developed workshop material, facilitated hands-on workshops in molecular dynamics; composed molecular dynamics “case study” material for public use.

Teaching Assistant, “University Physics: Mechanics,” Physics Department

1996–1997

Lead discussions and assisted students of introductory, calculus-based physics.

Stony Brook University (SUNY Stony Brook)

Tutor, Math Learning Center, Mathematics Department

1994–1996

Assisted students of all undergraduate levels in mathematics and statistics on an individual basis; lead review sessions in mathematics for large groups of students.

Teaching Assistant, “Calculus II,” Mathematics Department

1994–1995

Developed material for calculus discussion sections, including short lecture, homework, and quiz problems; lead discussion, review, and individual help sessions for calculus students.

AWARDS, FELLOWSHIPS, AND GRANTS

National Institutes of Health, K-22

Novel Pathway Analysis Methods for Identifying Genomic Causes of Cancer

pending review

12th International MGED Meeting

Poster Award

10/2009

National Institutes of Health

Fellows Award for Research Excellence

2009

Santa Fe Institute

Complex Systems Summer School

2009

ROSEMARY IRENE BRAUN, PH.D.

National Cancer Institute, NIH
Cancer Prevention Fellowship 2005–2009

University of Illinois, Urbana Champaign
Semifinalist, Campus Award for Excellence in Public Engagement 2003
GAANN Fellow, Department of Physics 1996–1997

Stony Brook University (SUNY Stony Brook)
Sigma Pi Sigma Physics Honor Society 1995
Honors College Scholar 1993–1996

GTE
GTE Scholarship 1993–1996

Commonwealth of Massachusetts State Senate
Citation of Academic Excellence 1993

PROFESSIONAL SOCIETIES AND SERVICE

National Institutes of Health
Fellows' Editorial Board 2007–2008
Assisted editing of manuscripts submitted by NIH fellows to the editorial board for comment.

International Society for Computational Biology
Member 2006–Present

Biophysical Society
Member 2001–2005

Graduate Employees' Organization, University of Illinois, Urbana-Champaign
Member 2000–2004
Co-president and Chief Negotiator 2002–2004
Served as chief spokesperson, representative, and liaison for UIUC Graduate Assistants; researched graduate assistant concerns, represented graduate assistants to university, media and community, coordinated and lead committees, mediated conflicts.

NIH Resource for Macromolecular Modeling and Bioinformatics, UIUC
Systems administration team 1999–2005
Assisted with administration of network of heterogeneous UNIX-based machines, including trouble-shooting, software installation, backup maintenance, and addressing user concerns.

Society of Physics Students, Stony Brook University
Member 1994–1996
Co-president 1995
Coordinated society meetings and seminars, facilitated communication between faculty and undergraduate students, and organized tutoring provided by society members to the university community.

SELECTED PRESENTATIONS AND PUBLISHED ABSTRACTS

<i>A Novel Method for Pathway-Based Analysis of Genome-Wide Association Study Data</i> 12th International MGED Meeting focusing on translational genomics and high throughput sequencing	10/2009
<i>The Informative Genome: Applying information theory the GWAS analysis</i> Fellows' research seminar, Cancer Prevention Fellowship Program, NCI/NIH	10/2008
<i>An Information Theoretic Approach to Genomic Data</i> Fellows' research seminar, Cancer Prevention Fellowship Program, NCI/NIH	06/2008
<i>Reproducibility and Cross-Platform Integration of MicroArrays</i> Microarray seminar, Laboratory of Human Carcinogenesis, NCI/NIH	07/2007
<i>Development of a Multi-Biomarker Signature for Cancer Prognosis and Diagnosis</i> Fellows' research seminar, Cancer Prevention Fellowship Program, NCI/NIH	04/2007
<i>Machine Learning Techniques for Microarray Data</i> Microarray seminar, Laboratory of Human Carcinogenesis, NCI/NIH	12/2006
<i>Molecular Dynamics Studies of SDS Aggregation About Glycophorin-A Transmembrane Helix Dimers</i> Biophysical Society Meeting	2004
<i>Molecular Dynamics Studies of Helix Association in Micelles</i> Biophysical Society Meeting	2002
<i>Invited speaker, Conference on the Higher Education Workforce</i> National Bureau of Economic Research (NBER) and Harvard Labor and Worklife Program	2002
<i>Molecular Dynamics Studies of Protein Interaction with Au Crystal Surface</i> Biophysical Society Meeting	2001

MANUSCRIPTS SUBMITTED / IN PREPARATION

- [1] **Rosemary Braun** and Kenneth Buetow. Pathways of Distinction Analysis: a new technique for multi-SNP analysis of GWAS data. *Submitted*, 2010.
- [2] **Rosemary Braun**, Greg Leibon, Scott Pauls, and Daniel Rockmore. Partition decoupling for multi-gene analysis of gene expression profiling data. *Submitted*, 2010 [arXiv:1002.3946].

PUBLICATIONS

- [1] **Rosemary Braun**, William Rowe, Carl Schaefer, Jinghui Zhang, and Kenneth Buetow. Needles in the haystack: Identifying individuals present in pooled genomic data. *PLoS Genetics*, 5(10):e1000668, 2009.
- [2] Ewy A. Mathé, Giang Huong Nguyen, Elise D. Bowman, Yiqiang Zhao, Anuradha Budhu, Aaron J. Schetter, **Rosemary Braun**, Mark Reimers, Kensuke Kumamoto, Duncan Hughes, Nasser K. Altorki, Alan G. Casson, Chang-Gong Liu, Xin Wei Wang, Nozomu Yanaihara, Nobutoshi Hagiwara, Andrew J. Dannenberg, Masao Miyashita, Carlo M. Croce, and Curtis C. Harris. MicroRNA expression in squamous cell carcinoma and adenocarcinoma of the esophagus: associations with survival. *Clinical Cancer Research*, 15:6192–6200, 2009.

- [3] **Rosemary Braun**, Leslie Cope, and Giovanni Parmigiani. Identifying differential correlation in gene/pathway combinations. *BMC Bioinformatics*, 9:488, 2008.
- [4] Jordi Cohen, Anton Arkhipov, **Rosemary Braun**, and Klaus Schulten. Imaging the migration pathways for O₂, CO, NO, and Xe inside myoglobin. *Biophys. J.*, 91:1844–1857, 2006.
- [5] James C. Phillips, **Rosemary Braun**, Wei Wang, James Gumbart, Emad Tajkhorshid, Elizabeth Villa, Christophe Chipot, Robert D. Skeel, Laxmikant Kale, and Klaus Schulten. Scalable molecular dynamics with NAMD. *J. Comp. Chem.*, 26:1781–1802, 2005.
- [6] **Rosemary Braun**, Donald M. Engelman, and Klaus Schulten. Molecular dynamics simulations of micelle formation around dimeric glycophorin-A transmembrane helices. *Biophys. J.*, 87:754–763, 2004.
- [7] **Rosemary Braun**, Mehmet Sarikaya, and Klaus Schulten. Genetically engineered gold-binding polypeptides: Structure prediction and molecular dynamics. *J. Biomat. Sci.*, 13:747–758, 2002.
- [8] Justin Gullingsrud, **Rosemary Braun**, and Klaus Schulten. Reconstructing potentials of mean force through time series analysis of steered molecular dynamics simulations. *J. Comp. Phys.*, 151:190–211, 1999.