

## BIOGRAPHICAL SKETCH

<b>NAME</b> David M. Reif		<b>POSITION TITLE</b> Statistician	
<b>EDUCATION/TRAINING</b>			
<b>INSTITUTION AND LOCATION</b>	<b>DEGREE (if applicable)</b>	<b>YEAR(s)</b>	<b>FIELD OF STUDY</b>
U.S. Environmental Protection Agency (RTP, NC)	Post-doc	2006-2008	Computational Toxicology
Vanderbilt University (Nashville, TN)	Ph.D.	2002-2006	Human Genetics
Vanderbilt University (Nashville, TN)	M.S.	2003-2005	Applied Statistics
College of William and Mary (Williamsburg, VA)	B.S.	1998-2002	Biology

### A. POSITIONS and HONORS

#### Research and Professional Experience:

- 2008-Present Statistician, National Center for Computational Toxicology,  
U.S. Environmental Protection Agency, Research Triangle Park, NC
- 2008-Present Visiting Scholar, Department of Statistics,  
North Carolina State University, Raleigh, NC
- 2006-2008 Biologist (federal post-doc), National Center for Computational Toxicology,  
U.S. Environmental Protection Agency, Research Triangle Park, NC  
(advisor: Elaine Cohen Hubal)
- 2002-2006 Graduate Research Assistant, Center for Human Genetics Research,  
Vanderbilt University, Nashville, TN  
(advisors: Jason Moore and Jonathan Haines)
- 1999-2001 Research Assistant, Department of Biology,  
College of William and Mary, Williamsburg, VA  
(advisor: Patty Zwollo)

#### Honors and Awards:

- 2007 OTS Award,  
Human Studies Division,  
U.S. Environmental Protection Agency, Research Triangle Park, NC
- 2005 International Travel Grant,  
Vanderbilt University, Nashville, TN
- 2003-2005 NIH Training Grant in Human Genetics,  
Vanderbilt University, Nashville, TN
- 2002 Phi Sigma Biology Honors Fraternity,  
College of William and Mary, Williamsburg, VA
- 2001 Omicron Delta Kappa Leadership Fraternity,  
College of William and Mary, Williamsburg, VA
- 2001 Monroe Scholarship Supplemental Award for International Research,  
College of William and Mary, Williamsburg, VA
- 2000-2001 Howard Hughes Medical Institute Undergraduate Research Grant,  
College of William and Mary, Williamsburg, VA
- 1998-2002 Monroe Scholar Honors Program,  
College of William and Mary, Williamsburg, VA
- 1998-2002 Commonwealth One Scholarship,

1998 College of William and Mary, Williamsburg, VA  
Daily News-Record Leadership Award,  
College of William and Mary, Williamsburg, VA

### **Selected Assistance/Advisory Support to the Agency and the Scientific Community:**

2009 “Gene-Environment Interactions”, *Science Café* presented by the North Carolina Museum of Science, Raleigh, NC, USA [seminar/discussion].

2008 Program Committee, “Bioinformatics and Computational Biology”, Genetic and Evolutionary Computation Conference, Atlanta, GA, USA.

2008 Career Panel, Durham Public Schools “Stay in School” program, Durham, NC, USA.

2008 “Human Genetics”, EPA-Shaw University Research Associateship Program, Chapel Hill, NC, USA [seminar].

2007-present Grant Reviewer, National Science Foundation.

2007 Session Chair, “Statistical and Mathematical Modeling for Community-Based Risk Assessment”, Community Based Risk Assessment Workshop, National Center for Environmental Research, Research Triangle Park, NC, USA.

2007 “Genotyping technology and analysis in cancer research”, Association for Biomedical Research, Chapel Hill, NC, USA [seminar].

2006-present *Ad-hoc* internal peer reviewer for EPA publications.

2006-present EPA Speaker’s Bureau

2006-present Reviewer for:  
*Pharmacogenomics*  
*BMC Bioinformatics*  
*Human Genetics*  
*Journal of Exposure Science and Environmental Epidemiology*  
*Journal of Infectious Disease*  
*Biotechniques*  
*Medical Science Monitor*

### **Teaching Experience:**

2008 Course Director and Lecturer, *Introduction to R*,  
**North Carolina State University**, Raleigh, NC, USA [semester course].

2006 Teaching Assistant & Guest Lecturer, *Statistics for Biomedical Researchers*,  
**Vanderbilt University**, Nashville, TN, USA [semester course].

2006 Guest Lecturer, *General Biology I & II*,  
**Nashville State Technical College**, Nashville, TN, USA [semester course].

### **Professional Societies and Affiliations:**

2007-present International Society of Exposure Analysis (**ISEA**)

2006-present American Association of Immunologists (**AAI**)

2005-present International Society of Computational Biology (**ISCB**)

2005-present Institute of Electrical and Electronic Engineers (**IEEE**)

2004-present American Society of Human Genetics (**ASHG**)

2004-present International Genetic Epidemiology Society (**IGES**)

2003-present American Statistical Association (**ASA**)

2003-present International Society for Genetic and Evolutionary Computation (**ISGEC**)

## **B. SELECTED PUBLICATIONS**

### **Peer-Reviewed:**

- 2008 Reif D.M., Motsinger A.A., McKinney B.A., Edwards K.M., Chanock S.J., Rock M.T., Crowe Jr. J.E., Moore J.H. **Integrated Analysis of Genetic and Proteomic Data Identifies Biomarkers Associated with Systemic Adverse Events Following Smallpox Vaccination.** *Genes and Immunity*, 9(8).
- 2008 Martin M.T., Judson R.S., Reif D.M., Kavlock R.J., Dix D.J. **Profiling Chemicals Based on Chronic Toxicity Results from the U.S. EPA ToxRef Database.** *Environmental Health Perspectives*, 116(11).
- 2008 Reif D.M., McKinney B.A., Motsinger A.A., Chanock S.J., Rock M.T., Moore J.H., Crowe Jr. J.E. **Genetic basis for systemic adverse events following smallpox vaccination.** *Journal of Infectious Diseases*, 198(1).
- 2008 Motsinger A.A., Reif D.M., Fanelli T.J., Ritchie M.D. **Comparison of computational approaches for genetic association studies.** *Genetic Epidemiology*, 32(6).
- 2008 Hardison N.E., Fanelli T.J., Dudek S.M., Reif D.M., Ritchie M.D., Motsinger A.A. **A Balanced Accuracy Fitness Function Leads to Robust Analysis using Grammatical Evolution Neural Networks in the Case of Class Imbalance.** *Genetic and Evolutionary Computation Conference*.
- 2007 Motsinger A.A., Reif D.M. **Embracing Complexity: Gene-gene and Gene-Environment Interactions.** In: *Genes, Genomes, and Genomics*, vol. 3.
- 2007 Motsinger A.A., Ritchie M.D., Reif D.M. **Novel Methods for Detecting Epistasis in Pharmacogenomics Studies.** *Pharmacogenomics*, 8(9).
- 2007 McKinney B.A., Reif D.M., White B.C., Crowe J.C., Moore J.H. **Evaporative cooling feature selection for genotypic data involving interactions.** *Bioinformatics*, 23(16).
- 2007 Reif D.M., Israel M.A., Moore J.H. **Exploratory visual analysis of statistical results of microarray experiments comparing high and low grade glioma.** *Cancer Informatics*, 2(1).
- 2007 Motsinger A.A., Reif D.M., Fanelli T.J., Davis A.C., Ritchie M.D. **Linkage disequilibrium in genetic association studies improves the power of Grammatical Evolution Neural Networks.** *IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology*.
- 2006 McKinney B.A., Reif D.M., Moore J.H., Crowe Jr. J.E. **Cytokine Expression Patterns Associated with Systemic Adverse Events Following Smallpox Immunization.** *Journal of Infectious Diseases*, 194(4).
- 2006 Reif D.M., Motsinger A.A., McKinney B.A., Crowe Jr. J.E., Moore J.H. **Feature Selection using Random Forests for the Integrated Analysis of Multiple Data Types.** *IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology*.
- 2006 McKinney B.A., Reif D.M., Ritchie M.D., Moore J.H. **Machine learning for detecting gene-gene interactions.** *Applied Bioinformatics*, 5(2).
- 2006 Motsinger A.A., Reif D.M., Dudek S.M., Ritchie M.D. **Understanding the Evolutionary Process of Grammatical Evolution Neural Networks for Feature Selection in Genetic Epidemiology.** *IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology*.
- 2006 Reif D.M., Moore J.H. **Visual analysis of statistical results from microarray studies of human cancer.** *Oncology Reports*, 15(5). [Cover Article].
- 2005 Wilke R., Reif D.M., Moore J.H. **Combinatorial pharmacogenetics.** *Nature Reviews Drug Discovery*, 4(11).
- 2005 White B.C., Gilbert J., Reif D.M., Moore J.H. **A statistical comparison of grammatical evolution strategies in the domain of human genetics.** *IEEE Congress on Evolutionary Computation*, 6(2).
- 2005 Reif D.M., Dudek S.M., Shaffer C.M., Wang J., Moore J.H. **Exploratory Visual Analysis of Pharmacogenomic Results.** *Biocomputing*, 9<sup>th</sup> ed.
- 2004 Reif D.M., White B.C., Moore J.H. **Integrated Analysis of Genetic, Genomic, and Proteomic Data.** *Expert Reviews in Proteomics*, 1 (1).
- 2003 Reif D.M., White B.C., Olsen N.J., Aune T.A., Moore J.H. **Complex function sets improve symbolic discriminant analysis of microarray data.** In: Cantu-Paz, E. *et al.* (eds.) *Lecture Notes in Computer Science*, 2724.

### Submitted:

- 2008 Heidenfelder B.N., Reif D.M., Harkema J., Cohen-Hubal E., Gallagher J, Edwards S.E. **Comparative microarray analysis and pulmonary morphometric changes in Brown Norway rats exposed to ovalbumin and/or concentrated airborne particulates.** Submitted to *Toxicological Sciences*.
- 2008 Sanchez Y., Deener K., Cohen-Hubal E., Reif D.M., Segal D.A. **Research Needs for Community Based Risk Assessment.** Submitted to *Journal of Exposure Science and Environmental Epidemiology*.

### In Preparation:

- 2009 Reif D.M., Heidenfelder B.N., Gallagher J., Hudgens E., Neas L., Rogers J., Williams A., Cohen-Hubal E., Edwards S.E. **Integrating multiple information sources to identify genomic biomarkers associated with subtypes of childhood asthma.**
- 2008 Elloumi F., Judson R.S., Dix D.J., Shah I., Knudsen T., Reif D.M., Singh A.V., Li Z., Wright F.A. **Deriving Toxicogenomics Pathway-based Concentration Response Profiles.**
- 2009 Reif D.M., Cohen-Hubal E. **Measuring environmental exposures for the characterization of gene-environment interactions.**
- 2009 Gallagher J., Hudgens E., Heidenfelder B.N., Reif D.M., Neas L., Williams A., Harkema J., Hester S., Edwards S.E., Cohen-Hubal E. **Integration of Exposure, Effects, and Susceptibility Data to Improve the Predictive Value of Biomarkers for Asthmatic Children.**
- 2009 Reif D.M., Crowe Jr. J.E., McKinney B.A. **Genetic factors predictive of post-vaccination antibody titers.**
- 2009 Reif D.M., Heidenfelder B.N., Harkema J., Gallagher J., Cohen-Hubal E. **Comparing gene expression patterns in blood and lung tissue of immunologically-challenged rats exposed to concentrated airborne particulates.**

### C. SELECTED PRESENTATIONS

- 2008 “Data integration adds etiological context to a childhood asthma gene expression study”, **Genetics Department Seminar Series**, North Carolina State University, Raleigh, NC, USA [invited seminar].
- 2008 “Integrating multiple data sources to discriminate subtypes of childhood asthma”, **Visiting Pulmonary Scholar Seminar Series**, University of North Carolina, Chapel Hill, NC, USA [invited seminar].
- 2008 “Integrating demographic, clinical, and environmental exposure information to identify genomic biomarkers associated with subtypes of childhood asthma”, **International Society of Exposure Analysis-International Society of Environmental Epidemiology (ISEA-ISEE) Joint Annual Meeting**, Pasadena, CA, USA [oral presentation].
- 2008 “Data integration for the Mechanistic Indicators of Childhood Asthma Study”, **Human Studies Division Seminar Series**, U.S. Environmental Protection Agency, Chapel Hill, NC, USA [seminar].
- 2007 “Detection and characterization of gene–gene and gene–environment interactions in common human diseases and complex clinical endpoints”, **Therapeutic Applications of Computational Biology and Chemistry (TACBAC)**, Wellcome Trust Conference Centre, Cambridge, UK [invited seminar].
- 2006 “Genetic factors associated with adverse events following smallpox vaccination”, **Vanderbilt University Genetics Retreat**, The Hermitage, TN, USA [oral presentation].
- 2006 “Strategies for the integration of multiple data types in analysis of complex clinical outcomes”, **Special Seminar**, U.S. Environmental Protection Agency, Research Triangle Park, NC, USA [seminar].

- 2006 "Integrated analysis of genetic and proteomic data", **Vanderbilt University Genetics Interest Group**, Nashville, TN, USA [seminar].
- 2005 "Exploratory Visual Analysis", **Pacific Symposium on Biocomputing (PSB)**, Lihue, HI, USA [oral presentation].
- 2003 "Symbolic Discriminant Analysis of microarray data using complex function sets", **Genetic and Evolutionary Computation Conference (GECCO)**, Chicago, IL, USA [oral presentation].

#### D. WEBSITES

<http://epa.gov/ncct/index.html>

[www.epistasis-list.org](http://www.epistasis-list.org)

[www4.stat.ncsu.edu/~dmreif/Site/ST610A.html](http://www4.stat.ncsu.edu/~dmreif/Site/ST610A.html)