

## CURRICULUM VITAE

**Name:** Marylyn DeRiggi Ritchie, PhD

**Work Address:** Pennsylvania State University  
Department of Biochemistry and Molecular Biology  
The Huck Institutes of the Life Sciences  
512 Wartik Laboratory  
University Park, PA 16870

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**E-mail Address:** [marylyn.ritchie@psu.edu](mailto:marylyn.ritchie@psu.edu)

**Website Address:** <http://ritchielab.psu.edu> and  
<http://visualization.ritchielab.psu.edu>

**Center Website Address:** <http://csg.psu.edu>

**H-index** : 45

### EDUCATION

1999, BS University of Pittsburgh at Johnstown (Biology)

2002, MS Vanderbilt University (Applied Statistics)

2004, PhD Vanderbilt University (Statistical Genetics)  
*Genetic Programming Optimized Neural Networks for Detecting  
Gene-Gene Interactions*

### PROFESSIONAL EMPLOYMENT

#### Academic Appointments

2004-2009 Assistant Professor  
Department of Molecular Physiology & Biophysics  
Vanderbilt University

2004-2011 Investigator  
Center for Human Genetics Research  
Vanderbilt University

2009-2011 Associate Professor with tenure  
Department of Molecular Physiology & Biophysics  
Vanderbilt University

2009-2011 Associate Professor, Secondary Appointment  
Department of Biomedical Informatics  
Vanderbilt University

## Curriculum Vitae: Marylyn DeRiggi Ritchie

- 2011- 2014 Associate Professor with tenure  
Department of Biochemistry and Molecular Biology  
Pennsylvania State University
- 2011-present Director, Center for Systems Genomics  
The Huck Institutes of the Life Sciences  
Pennsylvania State University
- 2014- present Professor with tenure  
Department of Biochemistry and Molecular Biology  
Pennsylvania State University

### Other Professional Positions

- 2005-2010 Consultant, Boehringer-Ingelheim

## Honors and Awards

- 1999 Graduated Summa Cum Laude, University of Pittsburgh, Johnstown
- 2000- 2002 NIH Breast Cancer Research Training Grant
- 2001 Vanderbilt University, Charles R. Park Student Travel Award
- 2002- 2003 NLM Bioinformatics Training Grant
- 2002 Vanderbilt University Graduate School Travel Grant
- 2003 Vanderbilt University Dissertation Enhancement Grant
- 2003 Vanderbilt University Graduate School Travel Grant
- 2003 Vanderbilt University, Charles R. Park Student Travel Award
- 2004 Best Paper Award, Genetic and Evolutionary Computation Conference
- 2006 *Genome Technology*, Rising Young Investigator Award
- 2010 Sloan Research Fellow
- 2011-2013 KAVLI Frontiers in Science fellow, National Academy of Science

Jointly sponsored by the US National Academy of Sciences and The Kavli Foundation, the Kavli Frontiers of Science bring together some of the very best young scientists to discuss exciting advances and opportunities in their fields in a format that encourages informal collective, as well as one-on-one discussions among participants. It is an honor to be selected as a Kavli fellow, and Dr. Ritchie was selected three years in a row.

**Membership in Professional Societies**

- American Statistical Association (ASA)
  - Middle TN Chapter Representative (2004-2006)
- American Society of Human Genetics (ASHG)
- International Neural Network Society (INNS)
- International Genetic Epidemiology Society (IGES)
  - Member of Education Committee (2009-2013)
- International Society for Genetic and Evolutionary Computation (ISGEC)
- International Society for Computational Biology (ISCB)

**Administrative and Service Contributions**

Institutional Service

- 2003-2004 Center for Human Genetics Research Core Oversight Board  
Vanderbilt University Medical Center, Nashville, TN
- 2005 Organizing Committee—CHGR Annual Genetics Symposium  
Vanderbilt University Medical Center, Nashville, TN
- 2006 ACCRE Study Group, co-chair  
Vanderbilt University, Nashville, TN
- 2006 Panel Member—Women in Academe Series  
Vanderbilt University Medical Center, Nashville, TN
- 2008 Faculty Recruitment Committee  
Center for Human Genetics Research
- 2009 Faculty Recruitment Committee, chair  
Center for Human Genetics Research
- 2009 Personalized Medicine Task Force - Vision 2020  
Vanderbilt University
- 2009 IGP Internal Review Administrative Subcommittee  
Vanderbilt University
- 2004-2001 Faculty Director, CHGR Computational Genomics Core  
Vanderbilt University Medical Center, Nashville, TN
- 2007-2011 ACCRE Faculty Advisory Board  
Vanderbilt University, Nashville, TN
- 2008-2011 Director, Program in Computational Genomics  
Vanderbilt University, Center for Human Genetics Research
- 2011 Biobehavioral Health Genetics Faculty Search Committee  
The Pennsylvania State University, University Park, PA

Curriculum Vitae: Marylyn DeRiggi Ritchie

- 2011-2012 PSU Presidential Task Force  
The Pennsylvania State University, University Park, PA
- 2011-2013 BMB Graduate Student Recruitment Committee  
The Pennsylvania State University, University Park, PA
- 2011-present BMB Junior Faculty Mentoring Committee  
The Pennsylvania State University, University Park, PA
- 2011-present Director, Center for System Genomics  
The Pennsylvania State University, University Park, PA
- 2012-present BMB Promotion & Tenure Committee  
The Pennsylvania State University, University Park, PA
- 2012-present iBIOS Bioinformatics & Genomics Graduate Program Admissions  
Committee  
The Pennsylvania State University, University Park, PA
- 2012-present Institute of Cyberscience, Search Committee  
The Pennsylvania State University, University Park, PA
- 2012-present IT Strategic Planning Committee  
The Pennsylvania State University, University Park, PA
- 2012-present Research Data and Computing Committee  
The Pennsylvania State University, University Park, PA

National / International Service

- 2002 Grant Reviewer, "Small Grants Program for Cancer Epidemiology."  
PA-01-021, National Cancer Institute, National Institutes of Health
- 2004 Workshop Organizer, Biological Applications of Genetic and  
Evolutionary Computation
- 2005 Session Organizer, Computational Approaches for Pharmacogenomics,  
Pacific Symposium on Biocomputing
- 2005 Program Committee, Biological Applications of Genetic and  
Evolutionary Computation
- 2005 Workshop Organizer, Biological Applications of Genetic and  
Evolutionary Computation
- 2006 Grant Reviewer, "Toward Maximizing the Scientific Value of the  
Biologic Specimens from the Women's Health Initiative."  
RFP-NHLBI-WH-06-09, National Heart, Lung, and Blood Institute,  
National Institutes of Health
- 2006 Session Organizer, Computational Approaches for Pharmacogenomics,  
Pacific Symposium on Biocomputing

Curriculum Vitae: Marylyn DeRiggi Ritchie

- 2006 Program Committee, Biological Applications of Genetic and Evolutionary Computation
- 2006 Workshop Organizer, Biological Applications of Genetic and Evolutionary Computation
- 2006 Program Committee, European Conference on Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics
- 2006 Workshop Organizer, PGRN Data Analysis Workshop
- 2007 Program Committee, Genetic and Evolutionary Computation Conference
- 2007 Program Committee, European Conference on Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics
- 2007 Grant Reviewer, "Facilitating Interdisciplinary Research via Methodological and Technological Innovation in the Behavioral and Social Sciences (R21)." RFA-RM-07-004, National Institutes of Health
- 2007 Grant Reviewer, "Small Grants Program in Cancer Epidemiology." PAR-06-294, National Cancer Institute (June and November), National Institutes of Health
- 2008 Program Committee, Genetic and Evolutionary Computation Conference
- 2008 Program Committee, International Conference on Intelligent Systems in Molecular Biology
- 2008 Grant Reviewer, "PA Department of Health Final Performance Reviews." Oak Ridge Associated Universities
- 2008 Grant Reviewer, "GWA Studies for the Genes, Environment, and Health Initiatives." RFA-HG-07-012, National Human Genome Research Institute, National Institutes of Health
- 2008 Grant Reviewer, "Toward Maximizing the Scientific Value of the Biologic Specimens from the Women's Health Initiative II." BAA HLBI-WH-09-01, National Heart, Lung, and Blood Institute, National Institutes of Health
- 2008 Grant Reviewer, "Genomic Parsing of Bipolar Disorder and Schizophrenia: Collaborative R01's (Teleconference)". Special Emphasis Panel/Scientific Review Group 2008/08 ZMH1 ERB-S (08). National Institute of Mental Health, National Institutes of Health
- 2008 Grant Reviewer, Israel Science Foundation's FIRST (Focal Initiatives in Research in Science and Technology)

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- 2008 Grant Reviewer, "Small Grants Program in Cancer Epidemiology." PAR-06-294, National Cancer Institute (June), National Institutes of Health
- 2009 Grant Reviewer, "GWAS of Treatment Response in Randomized Clinical Trials - Study Investigators." RFA-HG-08-004, National Human Genome Research Institute, National Institutes of Health
- 2009 Meeting Participant, "The Challenge of Mapping GWAS Signals." Hosted by the Genes, Environment and Health Initiative (GEI), and National Cancer Institute. National Institutes of Health.
- 2009 Conference Chair, European Conference on Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics
- 2010 Conference Chair, European Conference on Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics
- 2010 Program Committee, Genetic and Evolutionary Computation Conference
- 2010 Program Committee, The 2010 International Conference on Intelligent Computing (ICIC 2010)
- 2010 Session Chair, Genetic and Evolutionary Computation Conference
- 2010 Program Committee, European Conference on Computational Biology
- 2010 Program Committee, Pattern Recognition in Bioinformatics
- 2010 Host, P-STAR Analysis Workshop, October 2010, Nashville, TN
- 2005-2010 Grant Reviewer, Alzheimer's Association
- 2006-2010 Pharmacogenetics Research Network (PGRN) Analysis Working Group Co-Chair
- 2011 Workshop Chair, "Systems Pharmacogenomics: Birds of a Feather", Pacific Symposium on Biocomputing 2011
- 2011 Conference Chair, European Conference on Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics
- 2011 Program Committee, Asia-Pacific Translational Bioinformatics Conference
- 2011 External Examiner for Viva, University of Nottingham, Nottingham UK
- 2011 Program Committee, The 2011 International Conference on Intelligent Computing (ICIC 2011)
- 2011 Grant Reviewer, "Computational Tool Development and Integrative Data Analysis for LINCS (U01)", RFA- RM-10-005, Special Emphasis Panel, National Institutes of Health

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- 2011 Grant Reviewer, Ad Hoc, Genomics, Computational Biology and Technology (GCAT), National Institutes of Health
- 2011 Bioinformatics Track Chair, Genetic and Evolutionary Computation Conference
- 2011 Program Committee, European Conference on Artificial Life 2011
- 2011 Program Committee, Pattern Recognition in Bioinformatics 2011
- 2011 Host, P-STAR Analysis Workshop, December 2011, Chicago, IL
- 2011 Session Chair, "Beyond GWAS: Integrating Transcriptome, Proteome, and Pathway Data in the Genetic Dissection of Complex Traits", International Congress on Human Genetics, October 2011, Montreal, Canada
- 2012 Workshop Chair, "Systems Pharmacogenomics", Pacific Symposium on Biocomputing 2012
- 2012 Local Host, Genetic and Evolutionary Computation Conference, Philadelphia, PA
- 2012 Grant Reviewer, Genome Canada
- 2012 Program Committee, Asia-Pacific Translational Bioinformatics Conference
- 2012 External Examiner for PhD, University of Liege
- 2012 Host, P-STAR Analysis Workshop, December 2012, Austin TX
- 2012 Grant Reviewer, Special Emphasis Panel 2012/10 ZEY1 VSN, National Eye Institute
- 2012 Grant Reviewer, Special Emphasis Panel 2012/05 ZAI1 QV-I, National Institute of Allergy and Infectious Disease
- 2012 Grant Reviewer, Science Foundation Ireland
- 2012 Organizing Committee, KAVLI Frontiers in Science, American-Indonesian conference
- 2013 Organizing Committee, KAVLI Frontiers in Science, American-Indonesian conference
- 2013 Program Committee, Asia-Pacific Translational Bioinformatics Conference
- 2013 Guest Editor, PLOS Genetics
- 2013 Guest Editor, Frontiers in Genetics
- 2013 Program Committee, The 2013 International Conference on Intelligent Computing (ICIC 2013)
- 2013 Program Committee, Pattern Recognition in Bioinformatics 2013

## Curriculum Vitae: Marylyn DeRiggi Ritchie

- 2013 Host, P-STAR Analysis Workshop, December 2013, Nashville TN
- 2014 Organizing Committee, Pacific Symposium of Biocomputing
- 2007-2012 Grant Reviewer, Pennsylvania Performance Review, PA Department of Health
- 2007-present Managing Editor, BMC BioData Mining
- 2007-present Member, Faculty of 1000 Biology
- 2008-present Member, Genetic Epidemiology Scientific Review Committee for the Department of Veterans Affairs
- 2008-present Member Editorial Board, Pharmacogenomics
- 2009-present Executive Editor, Pharmacogenomics
- 2010-2013 Grant Reviewer, European Research Council
- 2011-present Member Editorial Board, Pharmacogenetics & Genomics
- 2012-present Member, Genomics, Computational Biology and Technology (GCAT), National Institutes of Health

## REVIEWER FOR JOURNALS

*Alcohol Research & Health, American Journal of Human Genetics, Annals of Human Genetics, Annals of Neurology, Arthritis Care and Research, Artificial Intelligence in Medicine, BioData Mining, Bioinformatics, Biometrical Journal, Biostatistics, BMC Bioinformatics, BMC Cancer, BMC Genetics, BMC Medical Genomics, BMC Systems Biology, Briefings in Bioinformatics, British Journal of Cancer, Cancer Epidemiology Biomarkers & Prevention, Cancer Informatics, Cellular and Molecular Life Sciences, Clinical Cancer, Clinical Genetics, Clinical Pharmacology & Therapeutics, Current Bioinformatics, Epidemiology, European Journal of Human Genetics, European Journal of Operational Research, EvoBio, Genes, Brain & Behavior, Genetic Analysis Workshop, Genetic and Evolutionary Computation Conference Proceedings, Genetic Epidemiology, Human Genetics, Human Genomics, Human Heredity, Human Immunology, Human Molecular Genetics, Human Mutation, IBM Systems Journal, IEEE Transactions in Evolutionary Computation, In Silico Biology, Intelligent Systems in Molecular Biology, International Journal Artificial Intelligence in Medicine, Journal of the American Medical Association (JAMA), Molecular Psychiatry, Nature Reviews Drug Discovery, Nature Reviews Genetics, Neoplasia, Neuropsychiatric Genetics, Nucleic Acids Research, Pacific Symposium on Biocomputing, Pharmacogenetics and Genomics, Pharmacogenomics, PLOS Computational Biology, PLOS Genetics, PLOS One, Proceedings of the National Academy of Science, Psychiatry Research, The Pharmacogenomics Journal, Science Translational Medicine, Source Code for Biology and Medicine, Statistics in Medicine, Transactions in Tropical Medicine*

## Teaching activities



Curriculum Vitae: Marylyn DeRiggi Ritchie  
Vanderbilt Contributions

- 2002 IGP Biostatistics Module, Lecturer  
Vanderbilt University
- 2004 Human Genetics—MPB 340, Lecturer  
Vanderbilt University
- 2004 IGP Biostatistics Module, Lecturer  
Vanderbilt University
- 2004 Health Systems Management Organization Course, Lecturer  
Vanderbilt University
- 2005 Human Genetics, HGEN 341, Lecturer  
Vanderbilt University
- 2005 Tutorials in Statistical and Population Genetics, HGEN 371,  
Co-Organizer  
Vanderbilt University
- 2006 Human Genetics, HGEN 341, Lecturer  
Vanderbilt University
- 2006 Tutorials in Statistical and Population Genetics, HGEN 371,  
Co-Organizer  
Vanderbilt University
- 2006 Cancer Biology Methodology Course, Lecturer  
Vanderbilt University
- 2007 Human Genetics, HGEN 341, Lecturer  
Vanderbilt University
- 2007 Tutorials in Statistical and Population Genetics, HGEN 371,  
Co-Organizer  
Vanderbilt University
- 2007 Cancer Biology Methodology Course, Lecturer  
Vanderbilt University
- 2008 Human Genetics, HGEN 341, Lecturer  
Vanderbilt University
- 2008 Organizer, Program in Computational Genomics Journal Club  
Vanderbilt University
- 2009 Human Genetics, HGEN 341, Lecturer  
Vanderbilt University
- 2009 Organizer, Program in Computational Genomics Journal Club  
Vanderbilt University
- 2009 Biomedical Informatics 310, Lecturer  
Vanderbilt University
- 2009 IGP, Human Genetics, Lecturer  
Vanderbilt University
- 2010 Human Genetics, HGEN 341, Lecturer  
Vanderbilt University

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- 2010 Biomedical Informatics 310, Lecturer  
Vanderbilt University
- 2011 Human Genetics, HGEN 341, Course Director  
Vanderbilt University

The Pennsylvania State University Contributions

- 2012 Tutorials in Bioinformatics & Genomics, iBIOS 598B FA, Co-director  
The Pennsylvania State University, University Park, PA
- 2012 Genomics, iBIOS/BMMB 551 FA, Lecturer  
The Pennsylvania State University, University Park, PA
- 2013 Tutorials in Bioinformatics & Genomics, iBIOS 598B SP, Co-director  
The Pennsylvania State University, University Park, PA
- 2013 Human Genomics and Biomedical Informatics, BMB498D, Director  
The Pennsylvania State University, University Park, PA
- 2013 Tutorials in Bioinformatics & Genomics, iBIOS 598B FA, Co-director  
The Pennsylvania State University, University Park, PA
- 2013 Genomics, iBIOS/BMMB 551 FA, Lecturer  
The Pennsylvania State University, University Park, PA

External Contributions

- 2009 Course Co-Director, Genetic Analysis of Complex Disease  
Miami Institute of Human Genetics, University of Miami
- 2010 Course Co-Director, Genetic Analysis of Complex Disease  
Miami Institute of Human Genetics, University of Miami
- 2010 Lecturer, Vanderbilt-NARI-NIE Informatics Training Program (VNNIT)  
Workshop, Pune, India
- 2010 "A comparison of analytical methods for genetic association studies,"  
CDC Workshop, Atlanta, GA
- 2011 Course Co-Director, Genetic Analysis of Complex Disease  
Miami Institute of Human Genetics, University of Miami
- 2011 "A comparison of analytical methods for genetic association studies II",  
CDC Workshop, Atlanta, GA
- 2011 "Next-generation Sequencing", CDC Workshop, Atlanta, GA
- 2012 Course Co-Director, Genetic Analysis of Complex Disease  
Miami Institute of Human Genetics, University of Miami
- 2012 "Next-generation Sequencing", CDC Workshop, Atlanta, GA
- 2013 "Next-generation Sequencing", CDC Workshop, Atlanta, GA
- 2013 Course Co-Director, Genetic Analysis of Complex Disease  
Miami Institute of Human Genetics, University of Miami

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2013 "Analysis Tools For Genetic Testing", CDC Workshop, Atlanta, GA

Advisory and Supervisory Responsibilities

High School Students

2007 Xun Miao  
Martin Luther King High School

Undergraduate Students

2005 Gordon Lemmon  
Vanderbilt Summer Science Academy

2006 Theresa Fanelli  
Vanderbilt Summer Science Academy

2012-2013 Christian Suri  
The Pennsylvania State University

2013 Tomek Dobranski  
The Pennsylvania State University

2013 Anastasia Lucas  
The Pennsylvania State University

Post-doctoral Fellows - Members of Lab

2009-2011 Sarah A. Pendergrass, PhD  
Vanderbilt University School of Medicine

2009-2011 Rebecca Zuvich, PhD  
Vanderbilt University School of Medicine

2013-present DoKyoong Kim, PhD  
The Pennsylvania State University

Graduate Students - Members of Lab

2004-2007 Alison A. Motsinger  
Vanderbilt University, Ph.D. Program in Human Genetics  
Currently Tenured Track Assoc. Prof. at North Carolina State University  
(Department of Statistics)

2005-2008 Todd L. Edwards  
Vanderbilt University, Ph.D. Program in Human Genetics  
Currently Tenure Track Asst. Prof. at Vanderbilt University (Department  
of Medicine, Center for Epidemiology)

2004-2009 William S. Bush  
Vanderbilt University, Ph.D. Program in Human Genetics  
Currently Tenure Track Asst. Prof. at Vanderbilt University (Department  
of Biomedical Informatics)

2006-2010 Stephen Turner  
Vanderbilt University, Ph.D. Program in Human Genetics  
Currently Director Bioinformatics Core, University of Virginia

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- 2008-2012 Benjamin Grady  
Vanderbilt University, Ph.D. Program in Human Genetics
- 2009-2013 Emily Holzinger  
Vanderbilt University, Ph.D. Program in Human Genetics  
Currently Post-doctoral fellow, National Human Genome Research  
Institute
- 2009-2013 Carrie Buchanan  
Vanderbilt University, Ph.D. Program in Human Genetics  
Currently 3<sup>rd</sup> year Medical Student, MD/PhD program, Vanderbilt  
University
- 2011-2013 Neerja Katiyar  
Pennsylvania State University, Ph.D. Program in Bioinformatics &  
Genomics
- 2011-present Molly Hall  
Pennsylvania State University, Ph.D. Program in BMMB
- 2012-present Ruowang Li  
Pennsylvania State University, Ph.D. Program in Bioinformatics &  
Genomics
- 2013-present Anna Okula  
Pennsylvania State University, Ph.D. Program in BMMB

Thesis Committees

- 2005-2006 Zheng (Roger) Liu  
Microbiology & Immunology  
Vanderbilt University School of Medicine
- 2005-2006 Tricia Thornton-Wells  
Neuroscience Program  
Vanderbilt University School of Medicine
- 2005-2007 Xueying (Sharon) Liang  
Human Genetics Ph.D. Program  
Vanderbilt University School of Medicine
- 2006-2008 Digna Velez  
Human Genetics Ph.D. Program  
Vanderbilt University School of Medicine
- 2007-2009 Daniel Kinnamon  
Statistical Genetics  
University of Miami Miller School of Medicine
- 2008-2009 Rebecca Zuvich  
Human Genetics PhD Program  
Vanderbilt University School of Medicine
- 2007-2010 Britney Grayson  
Microbiology & Immunology  
Vanderbilt University School of Medicine

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- 2008-2010 Logan Dumitriscu  
Human Genetics PhD Program  
Vanderbilt University School of Medicine
- 2010-2012 Janina Jeff  
Human Genetics PhD Program  
Vanderbilt University School of Medicine
- 2013-present Jacob Hall  
Human Genetics PhD Program  
Vanderbilt University School of Medicine
- 2013-present Claire Reynolds  
Biochemistry, Microbiology and Molecular Biology PhD Program  
The Pennsylvania State University
- 2013-present Matt Oetgens  
Human Genetics PhD Program  
Vanderbilt University School of Medicine
- 2013-present Marta Byrska-Bishop  
Bioinformatics and Genomics PhD Program  
The Pennsylvania State University
- 2013-present Rohit Reja  
Bioinformatics and Genomics PhD Program  
The Pennsylvania State University

**MAJOR RESEARCH INTERESTS**

Computational Genomics Genetic Epidemiology  
Bioinformatics Statistical Genetics  
Epistasis Systems Genomics  
Pharmacogenomics Computational Biology  
Proteomics Infectious Disease  
Evolutionary Computation Cardiovascular Disease

**SOFTWARE AND PATENTS**

- 2001 [Multifactor Dimensionality Reduction \(MDR\)](#)
- 2003 [MDR-PDT](#)
- 2002 U.S. Provisional Patent: "Method and Apparatus for Multifactor Dimensionality Reduction"
- 2006 [genomeSIMLA](#)
- 2009 [LD-Plus](#)
- 2009 [LD-Spline](#)
- 2010 [Synthesis-View](#)
- 2012 [ATHENA](#)

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2012 [Biofilter 2.0](#)

2012 [BioBin](#)

2012 [PheWAS-view](#)

2013 [Phenogram](#)

**RESEARCH FUNDING**

## Active Funding

**5U01 HL065962 (Roden, Ritchie PI U19-subcontract)**

09/01/2010-08/31/2015 2.40 calendar

months

NIH/NHLBI

\$2,772,165 annual

\$333,034 to Dr.

Ritchie

Pharmacogenomics of Arrhythmia Therapy: P-STAR Network Resource

Dr. Ritchie is the PI of the Statistical Analysis Resource to the PGRN (P-STAR). This is a U19 - network resource, that was submitted as part of a parent U01, per the RFA. Dr. Ritchie and her team lead this network resource which does methods development, applied studies, education and outreach, as well as statistical genetics consulting for the Pharmacogenomics Research Network (PGRN).

**5U01 HG006385 (Haines, Ritchie PI subcontract)**

08/15/2011-07/31/2015 1.20

calendar months

NIH/NHGRI

\$958,512 annual

\$212,345 to Dr.

Ritchie

eMERGE II Coordinating Center

This project will coordinate the activities of the eMERGE network in phase II. In particular, Dr. Ritchie's group will lead the coordination of the genomics data across the network. She is the PI of the genomics coordination efforts.

**5U01 HG006389 (McCarty, Ritchie PI subcontract)**

08/15/2011-07/31/2015 1.80 calendar

months

NIH/NHGRI

\$737,047 annual

\$189,535 to Dr.

Ritchie

IRIS: Incorporating Research into Sight: eMERGE II

Dr. Ritchie's lab leads all statistical genetics work for the Marshfield-Essentia eMERGE project. This includes genome-wide association studies, gene-gene and gene-environment interaction analyses, and all quality control of the genomic data.

**2 P01 ES011269-11 (Van de Water, Ritchie PI subcontract)**

04/01/2013 to

03/31/2018

0.6 calendar months

NIH/NIEHS

\$739,510 annual

\$372,498 to Dr.

Ritchie

UC Davis Center for Children's Environmental Health and Disease Prevention (CCEH):  
Perinatal Environment-Nerve-Immune Interactions in Neurodevelopmental Disorders

The Ritchie Lab will work on methods and analysis to explore gene-environment interactions associated with the risk for autism.

**5U01 HG004798-03 (Crawford, Ritchie PI-subcontract))**

06/01/2013-12/31/2013 .24

calendar months

NIH/NHGRI

\$150,000 annual

\$14,118 to Dr.

Ritchie

Epidemiologic Architecture for Genes Linked to Environment

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Dr. Ritchie's lab is leading the Pheome-Wide Association Studies (PheWAS) for the PAGE network

Completed Funding

- 2004-2005 Development award supported by CFAR - P30 AI54999 (PI)  
Genetic Basis of NNRTI Toxicity in HIV Patients
- 2004-2005 Development award supported by CFAR - P30 AI54999 (Co-PI)  
A Pilot Study of Mitochondrial Genetics and Peripheral Neuropathy during Antiretroviral Therapy
- 2004-2008 NIH R01 AG020135 (PI of subcontract)  
Revealing Epistasis in Alzheimer Disease
- 2005-2007 Development award supported by SPORE - P50 CA098131 (PI)  
Approaches to Genome-Wide Association in Sporadic Breast Cancer
- 2006-2009 AVCF- Vanderbilt (Co-investigator)  
DNA Capture Project - Dan Roden  
9/28/2007-7/31/2011
- 2006-2009 NIH R21 HL0877226 (Co-investigator)  
Iron as a Nutritional Modifier of Toxic Neuropathy in HIV/AIDS - Asha Kallianpur  
9/27/06-7/31/09
- 2007-2009 NIH R01 CA122756 (Co-investigator)  
Cell Cycle/Apoptosis Gene Variants and Breast Cancer - Jiyang Cai  
12/1/2007-11/30/2011
- 2007-2009 NIH/NIA R01 AG027944 (Co-investigator)  
Genomic Convergence in Alzheimer Disease - Pericak-Vance, Univ. of Miami  
12/01/2007-11/30/2012
- 2008-2009 NCCAM R01 AT004660 (Co-investigator)  
Dietary Calcium and Magnesium, Genetics and Colorectal Adenoma - Qi Dai  
06/01/2008-05/31/2012
- 2006-2009 NIH R21 NS059330 (Co-investigator)  
Mitochondrial Genomics and Peripheral Neuropathy during HIV Therapy - Todd Hulgan  
3/15/2007-6/30/2010
- 2004-2010 NIH U01 HL065962 (PI of core)  
Pharmacogenomics of Arrhythmia Therapy - Dan Roden  
9/01/2005-8/31/2010



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- 2007-2011 NIH U01 HG004603-01 (Co-investigator)  
Vanderbilt Genome-Electronic Records Project – Dan Roden  
9/28/2007-7/31/2011
- 2007-2011 NIH U01 HG004608 (PI of subcontract)  
Genome-Wide Study of Cataract and Low HDL in the Personalized  
Medicine Research Project – Catherine McCarty  
9/30/2007-9/29/2011
- 2009-2013 NIH/NLM 1R01LM009989-01A1 (Malin)  
Technologies to Enable Privacy in Biomedical Databanks  
07/01/2009-06/30/2013
- 2009-2011 NIH/NIGMS 1RC2GM092618-01 (Masys)  
VESPA: Vanderbilt Electronic Systems for Pharmacogenomic  
Assessment  
09/30/2009-09/29/2011
- 2010-2015 NIH U01 HL065962 (PI of core)  
Pharmacogenomics of Arrhythmia Therapy – Dan Roden  
9/01/2010-8/31/2015
- 2009-2013 NIH/NLM 1R01 LM010040-01(PI)  
Analysis Tool for Heritable and Environmental Network Associations  
07/01/2009-06/30/2013
- 2008-2013 NIH/NIAID 5R01 AI077505-03 (Haas)  
Pharmacogenomics of HIV Therapy  
07/08/2008-06/30/2013

## BIBLIOGRAPHY

### Peer-Reviewed Research Papers

1. **Ritchie MD**, Hahn LW, Roodi N, Bailey LR, Dupont WD, Plummer WD, Parl FF, Moore JH. Multifactor dimensionality reduction reveals high-order interactions among estrogen metabolism genes in sporadic Breast Cancer. *American Journal of Human Genetics*, 69:138-147 (2001). [PM 11404819](#), [PMC 1226028](#)
2. Moore JH, Hahn LW, **Ritchie MD**, Thornton TA, White BC. Application of genetic algorithms to the discovery of complex genetic models for simulation studies in human genetics. In: Langdon WB, Cantu-Paz E, Mathias K, Roy R, Davis D, Poli R, Balakrishnan K, Honavar V, Rudolph G, Wegener J, Bull L, Potter MA, Schultz AC, Miller JF, Burke E, and Jonoska N, eds. *Proceedings of the Genetic and Evolutionary Computation Conference*, Morgan Kaufmann Publishers, San Francisco, 1150-55 (2002). [PM n/a](#), [PMC n/a](#)
3. Donaldson JC, Dise RS, **Ritchie MD**, Hanks SK. Nephrocystin conserved domains involved in targeting to epithelial cell-cell junctions, interaction with filamins, and establishing cell polarity. *Journal of Biological Chemistry*, 277, 29028-29035 (2002). [PM 12006559](#), [PMC n/a](#)
4. Hahn LW, **Ritchie MD**, Moore JH. Multifactor dimensionality reduction software for detecting gene-gene and gene-environment interactions. *Bioinformatics*, 19, 376-382 (2003). [PM 12584123](#), [PMC n/a](#)

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5. **Ritchie MD**, Hahn LW, Moore JH. Power of Multifactor Dimensionality Reduction for detecting gene-gene and gene-environment interactions in the presence of genotyping error, missing data, phenocopy, and genetic heterogeneity. *Genetic Epidemiology*, 24, 150-157 (2003). [PM 12548676](#), [PMC n/a](#)
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Curriculum Vitae: Marylyn DeRiggi Ritchie

- Ritchie MD**, Wilkens LR, Le Marchand L. Association of the FTO Obesity Risk Variant rs8050136 With Percent Energy Intake from Fat in Multiple Ethnic/Racial Populations: The PAGE Study. *American Journal of Epidemiology*, in press (2013). [PM 23820787](#), [PMC 3755639](#)
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Curriculum Vitae: Marylyn DeRiggi Ritchie

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## Curriculum Vitae: Marylyn DeRiggi Ritchie

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  177. Sun X, Lu Q, Mukheerjee S, Crane PK, Elston R, Ritchie MD. Analysis pipeline for the epistasis search - statistical versus biological filtering. *Front Genet*. 2014 Apr 30;5:106. [PM 24817878](#), [PMC 4012196](#)

## Papers Submitted

1. Pendergrass SA, Buyske S, Frase AT, Dudek SM, Wallace JR, Ambite JL, Avery CL, Bůžková P, Deelman E, Fesinmeyer MD, Haiman C, Heiss G, Hindorff LA, Hsu CN, Jackson RD, Lin Y, Marchand LL, Matisse TC, Monroe KR, Moreland L, North KE, Park SL, Reiner A, Wallace R, Wilkens LR, Kooperberg C, Crawford DC, **Ritchie MD**. An Investigation of Pleiotropy using PheWAS in African Americans in the Population Architecture using Genomics and Epidemiology (PAGE) Network. *PLOS Genetics*, submitted April 9, 2013
2. Verma A, Kuivaniemi HS, Tromp GC, **Ritchie MD**, Pendergrass SA. Exploring Phenome Wide Associations (PheWAS) using Dynamic Network Visualization. *Pacific Symposium on Biocomputing*, submitted July 31, 2013
3. Li R, Kim D, Dudek SM, **Ritchie MD**. An Integrated Analysis of Genome-Wide DNA Methylation and Genetic Variants Underlying Etoposide-Induced Cytotoxicity in European and African Populations. *Pacific Symposium on Biocomputing*, submitted July 31, 2013
4. Kim D, Li R, Dudek SM, Frase AT, Pendergrass SA, **Ritchie MD**. Identifying Knowledge-Based Genomic Interactions Associated with Stage in Ovarian Cancer. *Pacific Symposium on Biocomputing*, submitted July 31, 2013
5. Verma SS, Peissig P, Cross D, Wauby C, Brilliant M, McCarty CA, **Ritchie MD**. Benefits of Accurate Imputations in GWAS: A Case Study. *Pacific Symposium on Biocomputing*, submitted July 31, 2013
6. Pendergrass SA, Frase AT, Wallace JR, Hall MA, Van Lishout F, Van Steen K, **Ritchie MD**. Investigating Gene-Gene Interaction Model Significance Using Biofilter 2.0. *Pacific Symposium on Biocomputing*, submitted July 31, 2013
7. **Ritchie MD**, Van Steen K, Gusareva E. Dimensionality reduction in Genome-Wide Association Interaction Studies (GWAIS): practical considerations. *Genome Medicine*, Submitted February 19, 2014.

## Peer-Reviewed Review Papers

1. Moore JH, **Ritchie MD**. Whole-genome genetics, *JAMA*, 291:1642-1643 (2004).

Curriculum Vitae: Marylyn DeRiggi Ritchie

2. **Ritchie MD**. Trends in genomic variation: a view of some of the latest technologies. *Drug Discovery Today*, 10(21):1417-1418 (2005). [PM 16243260](#), [PMC n/a](#)
3. **Ritchie MD**. Bioinformatics approaches for detecting gene-gene and gene-environment interactions in studies of human disease: a neurological focus. *Neurosurgical Focus*, 19(4):E2 (2005). [PM 16241104](#), [PMC n/a](#)
4. **Ritchie MD**, Motsinger AA. Multifactor Dimensionality Reduction for detecting gene-gene and gene-environment interactions in pharmacogenomics studies. *Pharmacogenomics*, 6(8):823-34 (2005). [PM 16296945](#)
5. McKinney BA, **Ritchie MD**, Moore JH. Machine learning for detecting gene-gene interactions. *Applied Bioinformatics*, 5:77-88 (2006). [PMC 3244050](#)
6. Motsinger A, Haas D, Hulgán T, **Ritchie M**. Human genomic association studies: a primer for infectious disease specialists. *Journal of Infectious Disease*, 195:1737-44 (2007).
7. Crawford DC, **Ritchie MD**, Rieder MJ. Identifying the genotype behind the phenotype: a role model found in VKORC1 and its association with warfarin dosing. *Pharmacogenomics*, 8:487-96 (2007).
8. **Ritchie MD**, Edwards TL, Fanelli TJ, Motsinger AA. Genetic heterogeneity is not as threatening as you might think. *Genetic Epidemiology*, 31:797-800 (2007).
9. Motsinger AA, **Ritchie MD**, Reif DM. Novel methods for detecting epistasis in pharmacogenomics studies. *Pharmacogenomics*, 8:1229-1241 (2007).
10. Motsinger AA, **Ritchie MD**. Neural networks for genetic epidemiology: past, present, and future. *BMC BioData Mining*, 1:3 (2008). [PMC2553772](#)
11. Vineis P, Brennan P, Canzian F, Ioannidis JPA, Matullo G, **Ritchie M**, Stromberg U, Taioli E, Thompson J. Expectations and challenges stemming from genome-wide association studies. *Mutagenesis*, 23(6):439-44 (2008).
12. Srinivasan BS, Chen J, Cheng C, Conti D, Duan S, Fridley BL, Gu X, Haines JL, Jorgenson E, Kraja A, Lasky-Su J, Li L, Rodin A, Wang D, Province M, and **Ritchie MD**. Methods for analysis in pharmacogenomics: Lessons from the Pharmacogenetics Research Network (PGRN) Analysis Group. *Pharmacogenomics*, 10:243-51 (2009). [PMC2737060](#)
13. **Ritchie MD**, Bush WS. Genome simulation approaches for synthesizing in silico datasets for human genomics. *Adv Genet*, 72: 1-24 (2010)
14. Grady BJ and **Ritchie MD**. Statistical optimization of pharmacogenomics association studies: Key Considerations from Study Design to Analysis. *CPPM*, 9:1; 41-66. 2011 [PM 21887206](#), [PMC 3163263](#)
15. Holzinger ER, **Ritchie MD**. Integrating heterogeneous high-throughput data for meta-dimensional pharmacogenomics and disease-related studies. *Pharmacogenomics*. 2012 Jan;13(2):213-22. [PM22256870](#)
16. **Ritchie MD**. The success of pharmacogenomics in moving genetic association studies from bench to bedside: study design and implementation of precision medicine in the post-GWAS era. *Hum Genet*. 2012 Oct;131(10):1615-26.

Non-Peer Reviewed Papers/Chapters

## Curriculum Vitae: Marylyn DeRiggi Ritchie

1. Moore JH, Thornton TA, **Ritchie MD**. Basic statistics. In: Dracopoli NC, Haines JL, Korf BR, Moir DT, Morton CC, Seidman CE, Seidman JG, Smith DR. (eds). *Current Protocols in Human Genetics*. Wiley-Liss, Inc., New York, A.3M.1-A.3M.10 (2003).
2. **Ritchie MD**, White B, Parker JS, Hahn LW, Moore JH. Optimization of neural networks using genetic programming improves detection and modeling of gene-gene interactions in studies of human diseases. *Genetic and Evolutionary Computation Conference Proceedings* (2003).
3. **Ritchie MD**, Moore JH. Biological applications of genetic and evolutionary computation. *Genetic and Evolutionary Computation Conference Workshop Proceedings* (2004).
4. **Ritchie MD**. Model Validation in Biological Applications of Genetic and Evolutionary Computation. *Genetic and Evolutionary Computation Conference Workshop Proceedings* (2004).
5. **Ritchie MD**. A review of computational approaches for detecting interactions. Educational Program. *American Association of Cancer Research* (2005).
6. Wilke RA, Carrillo MW, **Ritchie MD**. Pacific symposium on biocomputing - computational approaches for pharmacogenomics. *Pharmacogenomics*, 6(2):111-3 (2005). [PM 15882130](#), [PMC n/a](#)
7. **Ritchie MD**, Carillo MW, Wilke RA. Computational approaches for pharmacogenomics. *Pacific Symposium on Biocomputing Proceedings* (2005).
8. Carillo MW, Wilke RA, **Ritchie MD**. Computational approaches for pharmacogenomics. *Pacific Symposium on Biocomputing Proceedings*, 11:544-546 (2006).
9. Williams SM, Canter JA, Crawford DC, Moore JH, **Ritchie MD**, Haines JL. Problems with genome-wide association studies. *Science*, 316:1840-42 (2007).
10. Aguilar-Ruiz J, Moore JH, **Ritchie MD**. Filling the gap between Biology and Computer Science. *BioData Mining*, 1:1 (2008). [PMC2547862](#)
11. Haines JL, Crawford DC, **Ritchie MD**. A Primer in Statistical Methods in Genetics. In: Roden DM (ed), *Cardiovascular Genetics and Genomics*, Blackwell publishing (2009). [PMC n/a](#)
12. Pizzuti C, **Ritchie MD**, Giacobini M (eds). *Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics: 7<sup>th</sup> European Conference, Proceedings EvoBIO 2009*. Springer publishing (2009). [PMC n/a](#)
13. Moore JH, Clegg J, Marchiori E, **Ritchie MD**, and Smith S. Artificial Evolution Methods in the Biological and Biomedical Sciences. *JAEA*. 2009. [PMC n/a](#)
14. Pizzuti C, **Ritchie MD**, Giacobini M (eds). *Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics: 8<sup>th</sup> European Conference, Proceedings EvoBIO 2010*. Springer publishing (2010). [PMC n/a](#)
15. **Ritchie MD**, Bush WS. Genome Simulation: Approaches for Synthesizing *In Silico* Datasets for Human Genomics. In: *Advances in Genetics, Vol. 72*, Elsevier Inc (2010). [PMC n/a](#)
16. Moore JH, **Ritchie MD**. The central role of biological data mining in connecting diverse disciplines. *BioData Mining* 2013, 6:14

## ABSTRACT CONTRIBUTED PRESENTATIONS

Curriculum Vitae: Marylyn DeRiggi Ritchie

- 2003 "Optimization of Neural Networks using Genetic Programming to Improve Detection and Modeling of Gene-Gene Interactions in Studies of Human Diseases," Biological Applications in Genetic and Evolutionary Computation, Chicago, IL (Host: Wolfgang Banzhaf, peer-reviewed)
- 2003 "Optimization of Neural Networks using Genetic Programming to Improve Detection and Modeling of Gene-Gene Interactions in Studies of Human Diseases," Genetic and Evolutionary Computation Conference, Chicago, IL (Host: James Foster)
- 2004 "How Can We Detect Gene-Gene Interactions in Pharmacogenomic Studies?" Pharmacogenetics Research Network - Statistics Workshop, Los Angeles, CA (Host: Mike Province)
- 2004 "Model Validation Strategies in Biological Applications of Genetic and Evolutionary Computation," Biological Applications of Genetic and Evolutionary Computation Workshop, Seattle, WA (Host: Jason Moore, peer-reviewed)
- 2004 "GPNN as a Bioinformatics Tool for Human Genetics," Genetic and Evolutionary Computation Conference, Seattle, WA (Host: James Foster, peer reviewed)
- 2004 "MDR Reveals Gene-Gene Interactions Associated with Multiple Sclerosis," American Society of Human Genetics, Toronto, Canada, peer-reviewed
- 2004 "Gene-Gene Interaction Associated with Response to Treatment of Unipolar Major Depression Disorder," Cold Spring Harbor Laboratory: Pharmacogenomics, Cold Spring Harbor, NY, Peer-reviewed
- 2005 "Computational Approaches for Pharmacogenomics," Session Introduction at the Pacific Symposium on Biocomputing, The Big Island, HI (Host: Russ Altman, peer-reviewed)
- 2005 "Computational Approaches for Pharmacogenomics," Leader of Discussion Session at the Pacific Symposium on Biocomputing, The Big Island, HI (Host: Russ Altman)
- 2005 "Can Neural Network Constraints in GP Provide Power to Detect Genes Associated with Human Disease?" European Workshop on Evolutionary Computation and Bioinformatics, Lausanne, Switzerland (Host: Elena Marchiori, peer-reviewed)
- 2005 "Multifactor Dimensionality Reduction and the Power to Detect Pharmacogenomic Effects in Treatment of Tenureitis," Pharmacogenetics Research Network Statistics Workshop, Chicago, IL (Host: Nancy Cox and Mike Province, peer-reviewed)
- 2005 "Challenges and Strategies for Whole Genome Association Studies," American Society of Human Genetics, Salt Lake City, UT (Host: David Cox, peer-reviewed) *Given by Dr. Jonathan Haines due to maternity leave*
- 2006 "Tutorial on Computational Approaches for Pharmacogenomics," Pacific Symposium on Biocomputing, Maui, Hawaii (Host: Larry Hunter, peer-reviewed) *Given by Alison A. Motsinger due to maternity leave*

Curriculum Vitae: Marylyn DeRiggi Ritchie

- 2006 "GenomeSim: Data Simulation Software for Whole-Genome Association Studies," Pacific Symposium on Biocomputing, Maui, HI (Host: Russ Altman, peer-reviewed) *Given by Alison A. Motsinger due to maternity leave*
- 2006 "Grammatical Evolution Neural Networks: A Powerful Gene-Gene Interaction Detection Method," Genetic Analysis Workshop Special Session, St. Petersburg, FL (Host: Jean MacCleur, peer-reviewed)
- 2006 "The Potential of a Sequential Replication Approach for Whole Genome Association Studies," International Genetic Epidemiology Society, Tampa, FL (Host: Jeanne Cashman, peer-reviewed)
- 2006 "PLATO: A Platform for the Analysis, Translation, and Organization of Large Scale Data," Pharmacogenetics Research Network Analysis Workshop, Nashville, TN (Host: Mike Province, peer-reviewed)
- 2008 "Thinking about Epistasis in Whole Genome Association Studies," Pharmacogenetics Research Network Analysis Workshop, Memphis, TN (Host: Mary Relling, peer-reviewed)
- 2009 "Genome-wide association study identifies novel genomic regions associated with drug-induced Long QT Syndrome," CSHL-Wellcome Trust Pharmacogenomics Meeting, Hinxton, UK. (Host: Steve Leeder, peer-reviewed)
- 2009 "Genome-wide association study identifies novel genomic regions associated with drug-induced Long QT Syndrome," American Society for Human Genetics, Honolulu, HI. (peer-reviewed)
- 2010 "Using Biological Knowledge to Guide the Search for Epistasis in Genome-Wide Association Studies", American Society of Human Genetics, Washington DC. peer-reviewed
- 2010 "Chromosome 4q25 variants are genetic modifiers of rare ion channel mutations associated with familial atrial fibrillation", American Society of Human Genetics, Washington DC. peer-reviewed
- 2010 "Rare and Common Variants for Atrial Fibrillation", PGRN Statistical Analysis Workshop, Nashville, TN. peer-reviewed
- 2011 "Meta-dimensional analysis of phenotypes", International Congress on Human Genetics, Montreal, Canada, peer-reviewed
- 2012 "Meta-dimensional Analysis Of Complex Biological Traits Using ATHENA", Genetic Programming Theory in Practice, Ann Arbor, MI. peer-reviewed
- 2013 "Using Biological Knowledge in Modern Genomic Analysis of Complex Traits", Epistasis Discovery in Genetic Epidemiology (EDGE) 2013 Workshop, Key West, FL
- 2013 "Next generation analysis of human genome sequence", Pharmacogenomics Research Network Scientific Meeting, Chicago IL. peer-reviewed

**INVITED PRESENTATIONS**

Curriculum Vitae: Marylyn DeRiggi Ritchie

- 2001 "Approaches to Detecting Epistasis in Sporadic Breast Cancer," The Second Annual Genetics Symposium, Meharry Medical College, Nashville, TN (Host: Ellen Wright Clayton)
- 2001 "An Introduction to Neural Network Models for Statistical Data Analysis," Quantitative Brown Bag Seminar Series, Vanderbilt University, Nashville, TN (Host: Niels Waller)
- 2001 "Quantitative Resources on the WWW," Quantitative Brown Bag Seminar Series, Vanderbilt University, Nashville, TN (Host: Niels Waller)
- 2001 "Gene-Gene Interactions in Common, Complex Diseases," Molecular Physiology and Biophysics Seminar Series, Vanderbilt University, Nashville, TN (Host: Alan Cherrington)
- 2002 "Genetic Programming Optimization of Neural Network Architecture for the Detection of Gene-Gene Interactions," Biomathematics Seminar Series, Vanderbilt University, Nashville, TN (Host: Peter Hinow)
- 2002 "Neural Networks for Detecting Gene-Gene Interactions," Molecular Physiology and Biophysics Seminar Series, Vanderbilt University, Nashville, TN (Host: Alan Cherrington)
- 2003 "Data Reduction and Pattern Recognition Approaches for Complex Genetic Analysis," Statistical Genetics Seminar Series, Rockefeller University, New York, NY (Host: Jurg Ott, invited)
- 2003 "Data Reduction and Pattern Recognition Approaches for Complex Genetic Analysis," Clinical Epidemiology and Biostatistics Faculty Candidate Seminar, University of Pennsylvania, Philadelphia, PA (Host: Tim Rebbeck, invited)
- 2003 "Data Reduction and Pattern Recognition Approaches for Complex Genetic Analysis," Bioinformatics Faculty Candidate Seminar, Medical University of South Carolina, Charleston, SC (Host: Eberhard Voit, invited)
- 2003 "Data Reduction and Pattern Recognition Approaches for Complex Genetic Analysis," Human Genetics Faculty Candidate Seminar Series, Wake Forest University, Winston-Salem, NC (Host: Stephen Rich, invited)
- 2003 "Computational Approaches for Detecting Gene-Gene Interactions," Intelligent Systems for Molecular Biology Conference, Brisbane, Australia (Host: Mark Ragan, invited)
- 2003 "Optimization of Neural Networks using Genetic Programming to Improve Detection and Modeling of Gene-Gene Interactions in Studies of Human Diseases," National Library of Medicine Training Directors' Conference, Bethesda, MD (Host: Carol Bean, invited)
- 2003 "Neural Networks for Detecting Gene-Gene Interactions," Epidemiology Faculty Candidate Seminar Series, Wake Forest University, Winston-Salem, NC (Host: Lynne Wagenknecht, invited)
- 2003 "Data Mining and Pattern Recognition Approaches for Detecting Gene-Gene Interactions," Statistical Genetics Interview Seminar, Bristol-Myers Squibb, Hopewell, NJ (Host: Kim Zerba, invited)



Curriculum Vitae: Marylyn DeRiggi Ritchie

- 2003 "Computational Approaches for Detecting Gene-Gene Interactions," Molecular Physiology & Biophysics Faculty Candidate Seminar Series, Vanderbilt University, Nashville, TN (Host: Alan Cherrington, Jonathan Haines)
- 2003 "Neural Networks for Detecting Gene-Gene Interactions," Department of Human Genetics, University of Pittsburgh, Pittsburgh, PA (Host: Bob Ferrell, invited)
- 2004 "Analysis of Genome-Wide Epistasis via Dimensionality Reduction Procedures," International Biometric Society, Eastern North American Region 2004, Pittsburgh, PA (Host: David Allison, invited)
- 2004 "How to Look for Gene-Gene Interactions using Multifactor Dimensionality Reduction," Vanderbilt University GCRC Skills Workshop, Nashville, TN (Host: Dan Byrne)
- 2004 "Genome-Wide Association Studies: Challenges, Strategies, and MDR," Vanderbilt University Genetic Interest Group Seminar Series, Nashville, TN (Host: Kelly McDermott)
- 2004 "Neural Networks Approaches for Genetic Studies," Marshfield Clinic Research Foundation Scientific Seminar Series, Marshfield, WI (Host: Russell Wilke, invited)
- 2004 "Dissecting the Genetics of Complex Disease," National Society of Genetic Counselors, Washington, DC, invited
- 2005 "Parallel Multifactor Dimensionality Reduction: Applications in Rheumatoid Arthritis," Invited Presentation, Universitat Politecnica, Barcelona, Spain (Host: Sara Marsal, invited)
- 2005 "Computational Approaches to Detecting Interactions," Educational Session on Gene-Gene Interactions in Cancer Etiology at the AACR, Anaheim, CA (Host: Jason Moore, invited)
- 2005 "Multifactor Dimensionality Reduction for Detecting Epistasis," Joint Conference of the Classification Society of North America and the Interface Foundation of North America, St. Louis, MO (Host: Rob Culverhouse, invited)
- 2005 "Multifactor Dimensionality Reduction for the Analysis of Pharmacogenomics Data," Beyond Genome 2005: Genomic Variation, San Francisco, CA (Host: Catherine Lisciandra, peer-reviewed)
- 2005 "Detecting Gene-Gene Interactions Using Multifactor Dimensionality Reduction," Joint Statistical Meetings, Minneapolis, MN (Host: Cheng Cheng, invited)
- 2005 "Multifactor Dimensionality Reduction for the Analysis of Epistasis in Studies of Human Disease and Pharmacogenomics," Boehringer-Ingelheim Invited Special Seminar, Danbury, CT (Host: Supriya Jayadev, invited)
- 2005 "Data Mining Approaches in Biological Sciences," Fields Institute on Data Mining, Toronto, Canada (Host: Helmut Kroger, invited)  
*Given by Will Bush due to maternity leave*

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- 2006 "The Complexities of Data Analysis in Human Genetics," Complex Data Conference, Vanderbilt University Kennedy Center, Nashville, TN (Host: Jennifer Blackford, invited)
- 2006 "Multifactor Dimensionality Reduction for Detecting Gene-Gene and Gene-Environment Interactions," Vanderbilt University Center for AIDS Research, Nashville, TN (Host: Todd Hulgan, invited)
- 2006 "Challenges and Strategies for Whole-Genome Association Studies," Boehringer Ingelheim Invited Speaker, Danbury, CT (Host: Jing Yuan, invited)
- 2007 "Computational Genetics Approaches in Cancer Epidemiology," University of Miami Bio-behavioral Oncology and Cancer Control Program Meeting, Miami, FL (Host: Jennifer Hu, invited)
- 2007 "The MDR Approach," ECNIS WP 7-8 Workshop, "AFTER GWAS: an Exercise in Problem Solving," Venice, Italy (Host: Paolo Vineis, invited)
- 2007 "Computational Genomics in the Whole Genome Era," University of Virginia, Charlottesville, NC (Host: Stephen Rich, invited)
- 2008 "Computational Genomics in the Whole Genome Era," Washington University in St. Louis, St. Louis, MO (Host: Mike Province, invited)
- 2008 "A Bio-filter for Systems Biology," NEWGENERIS Workshop, Athens, Greece (Host: S.A. Kyrtopoulos, invited)
- 2008 "Epistasis Modeling," Keystone Symposium on Towards Identifying the Pathophysiology of Autistic Syndromes, Santa Fe, NM (Host: Joseph Piven and Pat Levitt, invited)
- 2008 "Epistasis, Stratification, and Confounding: Lessons from Genomic Analyses," ASCPT, Orlando, FL (Host: Issam Zineh, invited)
- 2008 "Computational Genomics in the GWAS Era," NIEHS, Raleigh-Durham, NC (Host: Gregg Dinse, invited)
- 2009 Invited Seminar, University of Alabama Department of Genetics, Birmingham, AL (Host: Hemant Tiwari, invited)
- 2009 "Computational Strategies for Genome-Wide Association Studies," Korea Pharmacogenetics Research Network Annual Symposium, Seoul, Korea (Host: Ju Han Kim, invited)
- 2009 "Individual Opt-Out: Efficacy, Challenges, and Concerns," American Society for Human Genetics, Honolulu, HI. (Host: Laura Rodriguez, invited)
- 2009 "Genome Wide Association Studies," Annual Education Conference of the National Society of Genetic Counselors, Atlanta, GA.
- 2010 "Summary of the state-of-the-art for gene-gene interaction analysis," CDGCA, Belgium, Host: Kristel Van Steen, invited
- 2010 "Beyond GWAS: Integrating Transcriptome, Proteome, and Pathway Data in the Genetic Dissection of Complex Traits", Huck Institutes of Life Sciences, Pennsylvania State University, State College, PA
- 2011 "Pharmacogenetics using the electronic medical record and a large institutional biobank", Dartmouth Medical School, Lebanon, NH

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- 2011 “Bringing Biology Back to Human Genomics”, University of Nottingham, Nottingham, UK
- 2011 “Surfing the Tsunami of Human Genetic Data”, University of Idaho, Moscow, ID
- 2011 “Phenotype-Genotype Associations in DNA Biobanks Linked to Electronic Medical Records”, Asia-Pacific Translational Bioinformatics Conference, Seoul, Korea
- 2011 “Using Biological Knowledge in Modern Genomic Analysis of Complex Traits”, University of California at Davis (Host: Isaac Pessah)
- 2011 “Using biological knowledge to inform complex genetics analysis”, NIEHS meeting Bioinformatics and Computational Approaches to Integrate Genes and Environment in Autism Research, Durham, NC
- 2011 “Beyond GWAS: Integrating Transcriptome, Proteome, and Pathway Data in the Genetic Dissection of Complex Traits”, Flash Poster Talk, Kavli Frontiers in Science, National Academy of Science, Irvine, CA
- 2011 “Genomics and Pharmacogenomics using the electronic medical record and a large institutional biobank”, Geisinger Clinic, Weis Center for Research, Danville, PA (Host: David Carey)
- 2012 “Meta-Dimensional Analysis of Phenotypes to Dissect the Architecture of Complex Traits”, Keystone Symposium, Complex Traits: Genomics and Computational Approaches, Breckenridge, CO
- 2012 “Mining electronic health records for genomic research - experiences of the eMERGE network”. Inaugural Symposium of Penn State Hershey Institute for Personalized Medicine, Hershey, PA
- 2012 “Searching for the missing heritability in gene-gene and gene-environment interactions”, University of Georgia Symposium, Methodological and Statistical Issues in Gene-Environment and Gene-Gene Interaction Research, Atlanta, GA
- 2012 “The phenome and pleiotropy: Dissecting the architecture of complex traits”, AACR-MEG Special Conference on Post-GWAS Horizons in Molecular Epidemiology: Digging Deeper into the Environment, Hollywood, FL
- 2012 “Meta-Dimensional Analysis for Dissecting the Architecture of Complex Traits”, University of Liege, Liege, Belgium
- 2013 “Overview of pharmacogenomics, gene-gene interactions, system genomics”, Eastern North America Region International Biometric Society 2013, Orlando, FL
- 2013 “Analytic approaches for complex trait analysis”, American Association of Cancer Research Educational Session, Washington DC
- 2013 “The Next Frontier in Genomics: Data Analysis Strategies”, Ohio State University Comprehensive Cancer Center Annual Scientific Meeting, Columbus OH
- 2013 “Complex genetic analysis: Searching for the missing heritability”, Ohio State University, Columbus OH

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- 2013 “Analysis technologies to go beyond a single gene: the quest for understanding genetic architecture”, University of Maryland, Baltimore MD
- 2013 “Bioinformatics tools for incorporating biological knowledge into genetic analysis”, Advances in Statistical Methods for Cancer Genetic Epidemiology. Memorial Sloan-Kettering, New York, NY. Host: Sanjay Shete.
- 2013 “Bringing Biology back to Genomics”. University of Pittsburgh, Pittsburgh, PA. Host: Robert Ferrell.
- 2013 “The quest for understanding genetic architecture”, University of Chicago, Chicago IL. Host: Barbara Stranger.
- 2014 TBD. Case-Western Reserve University. Host: Jonathan L. Haines.