

CURRICULUM VITAE

MARGUERITE MULRYAN IRVIN, PH.D., M.S.

Current Office Address:

*Department of Epidemiology
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FORMAL EDUCATION

Doctor of Philosophy, Epidemiology

*The University of Alabama at Birmingham, Ryals School of Public Health, August 2008
GPA: 4.0*

Master of Science, Biostatistics

*Medical University of South Carolina, Charleston, May 2004
GPA: 3.95*

Bachelor of Science, Biology

*University of North Carolina at Chapel Hill, Dec 1999
GPA: 3.85 (Major) with Honors, 3.77 (Overall)*

FACULTY APPOINTMENTS

2011- Assistant Professor, Department of Epidemiology, University of Alabama at Birmingham School of Public Health, Birmingham, AL

POSTDOCTORAL RESEARCH

Department of Epidemiology and Section on Statistical Genetics at UAB, August 2008-May 2011

Fellowship in genetic epidemiology with a focus on study design, phenotype definition, laboratory issues and statistical analysis of genome wide association studies of single nucleotide polymorphisms and copy number variants with cardiometabolic disorders. An additional focus includes pharmacogenetics of adverse metabolic outcomes following antihypertensive treatment and the pharmacogenetics of response to lipid lowering treatment. (Advisor's Name: Donna K Arnett, Phone: (205) 975-7669)

DOCTORAL RESEARCH

Department of Epidemiology at UAB, August 2004-August 2008

My dissertation research involved the study of genetic and psychiatric treatment related risk factors for type 2 diabetes (T2D) in participants from the PAARTNERS Familial Study of Schizophrenia Liability (1 R01 MH66181). Results showed transcription factor 7 like 2 (*TCF7L2*), a risk factor for T2D in the general population, is also a risk factor for T2D in African-American patients with schizophrenia or schizoaffective disorder. Additionally, we showed the gene may modify the association of antipsychotic treatment with T2D. Research in larger populations of patients is needed to determine if T2D associated polymorphisms are of interest in the pharmacogenetics of antipsychotic treatment. I also worked on projects in Alzheimer's Disease (AD) including candidate gene association studies and a linkage scan for age at onset of disease in the National Institute of Mental Health AD genetic initiative sample. (Advisor's Name: Rodney Go, email: RGo@ms.soph.uab.edu)

OTHER PROFESSIONAL EXPERIENCE

Project Manager and Multi-Site Coordinator, UAB Dept of Epidemiology August 2004-August 2008

- Project manager for the PAARTNERS Familial Study of Schizophrenia Liability (1 R01 MH66181) in African Americans centered at UAB.
- Performed data quality control, data analysis, and scientific writing.

- Statistical software utilized: SAS, FBAT, Genehunter and SOLAR.
- Corresponded with the other 7 sites regarding data submission, data quality control, and discuss study protocol procedures.
- Advisor's Name: Rodney C.P. Go, email: RGo@ms.soph.uab.edu

**Ph.D. Candidate Research Assistant, Department of Biostatistics at UAB
August 2007-August 2008**

- Assessed the association of candidate gene, environment (diet), and gene by environment interactions with obesity related traits in the Yu'pik Eskimo population as pertaining to the study titled "Genetics of Obesity in Yup'ik Eskimos" (3R01DK074842-02S1).
- Calculated descriptive statistics, Hardy-Weinberg equilibrium testing, and linkage disequilibrium between SNPs
- Performed association testing using mixed models and explored methods to adjust for relatedness in datasets with very large pedigrees.
- Advisor's Name: Hemant Tiwari, Phone: (205) 934-4907

Statistical and Research Analyst II, Department of Pulmonary and Critical Care Medicine at the Medical University of South Carolina, 2000-2004

- Manager of the Alpha-1 Foundation's National Research Registry for persons affected by Alpha-1 Antitrypsin Deficiency
- Involved in subject recruitment, survey data collection, data entry, database design, database maintenance, website design, and study protocol maintenance,
- Performed descriptive data analysis and scientific writing
- Advocated for the registry and gave presentations at regional research and awareness meetings
- Utilized Filemaker Pro, STATA, Excel and Power Point
- Supervisor's Name: Charlie Strange, Phone: (843) 792-3712

**Research Assistant, Department of Biology, University of North Carolina at Chapel Hill
1998-2000**

- Performed wet-lab work to knock out the gene for the E2F2 protein in Drosophila melanogaster
- Investigated the protein's function in the cell cycle
- Duties included fly care, fly crosses and administration of mutagen exposure to the flies
- Supervisor's Name: Bob Duronio, Phone: (919) 962-7749

**Intern National Institute of Environmental Health Sciences, Research Triangle Park, NC
Summer 1999**

- Organized and prepared a mouse cDNA library to create a microarray chip
- Supervisor's Name: Rick Paules, Phone: (919) 541-3710

PROFESSIONAL MEMBERSHIPS

2006	International Genetic Epidemiology Society
2009	Nominated Member of AAAS/Science Program for Excellence in Science
2011	American Heart Association

TEACHING EXPERIENCE AT UAB

2005-2006	TA Quantitative Methods in Epidemiology EPI625 (2 Summer Terms)
2011	Guest Lecturer Genetic Epidemiology EPI731 (2 sessions)
2012	Guest Lecturer Genetics in Public Health EPI635 (1 session)
2012	Guest Lecturer Graduate Biomedical Sciences GBS 721 (2 sessions)

INVITED LECTURES

Search for genes associated with metabolic traits in special populations: progress and pitfalls. UAB Department of Epidemiology Seminar Series. October 2010, Birmingham, AL

Pharmacogenetics of Fenofibrate Response in the GOLDN study. UAB Department of Epidemiology Seminar Series. February 2011, Birmingham, AL

PUBLICATIONS

*previously published under Dickson MR

1. Strange C, **Dickson MR**, Carter C, Carpenter MJ, Holladay B, Lundquist R, Brantly ML. Genetic testing for alpha-1 antitrypsin deficiency. *Genet Med*. 2004 Jul-Aug; 6(4):204-10.
2. **Dickson MR**, Perry RT, Wiener H, Go RC. Association Studies of transforming growth factor beta 1 and Alzheimer's Disease. *Am J Med Genet B Neuropsychiatr Genet*. 2005 Nov 5; 139(1):38-41.
3. Strange C, Stoller JK, Sandhaus RA, **Dickson R**, Turino G. Results of a survey with alpha-1 antitrypsin deficiency. *Respiration*. 2006 Aug 3; 73(2):185-90.
4. Carpenter MJ, Strange C, Jones Y, **Dickson MR**, Carter C, Moseley MA, Gilbert GE. Does genetic testing result in behavioral health change? Changes in smoking behavior following testing for alpha-1 antitrypsin deficiency. *Ann Behav Med*. 2007 Feb;33(1):22-8.
5. **Dickson MR**, Li J, Wiener H, Perry RT, Blacker D, Bassett SS, Go R C.P. A Genomic Scan for Age at Onset of Alzheimer's Disease in 437 Families from the NIMH Genetic Initiative. *Am J Med Genet B Neuropsychiatr Genet*. 2008 Sep 5;147B(6):784-92.
6. **Dickson MR**, Carter CL, Carpenter MJ, McClure RL, McGee DA, Zapka JG, Strange C. Barriers to genetic testing among persons at risk for alpha-1 antitrypsin deficiency. *Genet Test*. 2008 Dec;12(4):501-5.
7. Padilla MA, **Irvin MR**, Tiwari HK (2008). Gene-environment Interactions: Gene-environment interactions in human traits. Nriagu (editor), Encyclopedia on Environmental Health, Elsevier Science, 2011.
8. Wiener HW, Klei L, **Irvin MR**, Perry RT, Aliyu MH, Allen TB, Bradford LD, Calkins ME, Devlin B, Edwards N, Gur RE, Gur RC, Kwentus J, Lyons PD, McEvoy JP, Nasrallah HA, Nimgaonkar VL, O'Jile J, Santos AB, Savage RM, Go RC. Linkage Analysis of Schizophrenia in African-American Families. *Scz Res*. 2009 Apr;109(1-3):70-9. PMID: PMC2721327
9. **Irvin MR**, Wiener HW, Perry RP, Savage RM, Go RC. Genetic risk factors for type 2 diabetes with pharmacologic intervention in African-American patients with schizophrenia or schizoaffective disorder. *Schizophr Res*. 2009 Oct;114(1-3):50-6 PMID: PMC2753171
10. Shrestha S, **Irvin MR**, Taylor KD, Wiener HW, Pajewski NM, Haritunians T, Delaney JA, Schambelan M, Polka JF, Arnett DK, Chen YD, Grunfeld C. A genome-wide association study of carotid atherosclerosis in HIV-infected men AIDS 2010, 24:000-000. PMID: PMC3072760
11. **Irvin MR**, Kabagambe EK, Tiwari, HK, Parnell LD, Robert Straka RJ, Tsai MY, Ordovas, JM, Arnett DK. Apolipoprotein E polymorphisms and postprandial triglyceridemia before and after fenofibrate treatment in the GOLDN Study. *Circ Cardiovasc Genet*. 2010 Oct 1;3(5):462-7 PMID: PMC3119521
12. **Irvin MR**, Lynch AI, Kabagambe EK, Tiwari HK, Barzilay JI, Eckfeldt JH, Eric Boerwinkle E, Davis BR, Ford CE, Arnett DK. Pharmacogenetic association of hypertension candidate genes with fasting glucose in the GenHAT Study. *J Hypertens*. 2010 Oct;28(10):2076-83 PMID: PMC2957368
13. Zhang Q, **Irvin MR**, Arnett DK, Province MA, Borecki I. A data-driven method for identifying rare variants with heterogeneous trait effects. *Genet Epidemiol*. 2011 Nov; 35(7):679-85 PMID: PMC3201701
14. **Irvin MR**, Wineinger NE, Rice TK, Pajewski NM, Kabagambe EK, Gu CC³, Pankow J, North KE, Wilk JB, Freedman BI, Franceschini N, Broeckel U, Tiwari HK, Arnett DK. Genome-wide detection of allele specific copy number variation associated with insulin resistance in African Americans from the HyperGEN study. *PLoS ONE* 2011 Aug 15; 6(8): 1-6. PMID: PMC3162025
15. **Irvin MR**, Shrestha S, Tiwari HK, Taylor KD, Wiener HW, Pajewski NM, Arnett DK, and Grunfeld C. Genes linked to energy metabolism and immunoregulatory mechanisms are associated with subcutaneous adipose tissue distribution in HIV-infected men. *Pharmacogenet and Genomics* 2011 Dec; 21(12): 798-807 PMID 3210910
16. Aslibekyan S, Kabagambe EK, **Irvin MR**, Straka RJ, Borecki IB, Tiwari HK, Tsai MY, Hopkins PN, Ordovas JM, Arnett DK. A genome-wide association study of inflammatory markers before and after

fenofibrate treatment in Genetics of Lipid Lowering and Diet Network (GOLDN) participants. Pharmacogenetics and Genomics, (In Press).

17. **Irvin MR**, Zhang Q, Kabagambe EK, Perry RT, Straka RJ, Tiwari HK, Borecki IB, Shimmin LC, Stuart C, Zhong Y, Hixson JE, Arnett DK. Rare PPAR α variants and extreme response to fenofibrate in the Genetics of Lipid Lowering Drugs and Diet Network Study. Pharmacogenetics and Genomics, (In Press).

ABSTRACTS AND POSTERS

1. **Irvin MR**, Wood AC, Vaughn LK, Kabagambe EK, Sha J, Tiwari HK, Borecki IB, Ordovas JM, Arnett DK. Genetics of Insulin Response to Fenofibrate in the GOLDN Study. Poster Presentation at AHA Scientific Sessions. Nov 12-15 2011, Orlando FL

2. **Irvin MR**, Kabagambe EK, Zhang Q, Sha J, Tiwari HK, Borecki IB, Province MA, Shimmim LC, Hixson JE, and Arnett DK.. Rare PPAR α variants and extreme response to fenofibrate in the GOLDN Study. Poster Presentation at the 51th annual American Heart Association Cardiovascular Disease Epidemiology and Prevention Conference. March 23-25th 2011, Atlanta, GA

3. **Irvin MR**, Kabagambe EK, Zhang Q, Sha J, Tiwari HK, Borecki IB, Province MA, Shimmim LC, Hixson JE, and Arnett DK. Rare PPAR α variants and extreme response to fenofibrate in the GOLDN Study. Poster Presentation at Evolution of Next-Generation Sequencing Data Management Workshop. September 27-29th 2010, Providence, Rhode Island

4. **Irvin MR**, Wineinger N, Pajewski NM, Kabagambe EK, Gu CC, Pankow J, North KE, Wilk JB, Freedman B, Franceschini N, Tiwari HK, Arnett DK. Genome wide detection of allele specific copy number variation associated with diabetes related traits in African Americans from the HyperGEN Study. Poster Presentation at HudsonAlpha Spring Symposium. March 30th 2010, Huntsville, AL

5. **Irvin MR**, Lynch AI, Kabagambe EK, Tiwari HK, Barzilay JI, Eckfeldt J, Boerwinkle E, Davis BR, Ford CE, Arnett DK. Pharmacogenetic association of hypertension candidate genes with fasting glucose in the GenHAT Study. Poster Presentation at the 50th annual American Heart Association Cardiovascular Disease Epidemiology and Prevention Conference. March 3-5th 2010, San Francisco, California

6. **Dickson MR**, Wiener HW, Perry RP, Go R CP. Genetic risk factors for type 2 diabetes with pharmacologic intervention in patients with schizophrenia and schizoaffective disorder. Poster Presentation at Genome-wide Association: Analyze This! August 2008, Bethesda, MD

7. **Dickson MR**, Go R CP, Wiener H, Blacker D, Bassett SS. A genomic scan for age at onset of alzheimer's disease from the NIMH Genetic Initiative. Poster Presentation at Annual International Genetic Epidemiology Society Meeting. November 2006, Tampa Bay, FL.

PEER REVIEW

Obesity (added to reviewer database 7/2010)

Circulation: Cardiovascular Genetics (Ad hoc Review)

Clinical Genetics (Ad hoc Review)

RESEARCH SUPPORT

Epigenetic Determinants of Lipid Response to Dietary Fat and Fenofibrate

NHLBI 1R01HL104135-01 (PI: Arnett)

Research focuses on genetic and epigenetic response to lipid lowering treatment with fenofibrate in the Genetics of Lipid Lowering and Diet Network Study (GOLDN).

Role: Assistant Professor (2011-Current)

Training Grant

NINDS T32NS054584 (PI: Cutter)

Research focus is on pharmacogenetic risk for cardiovascular disease in disadvantaged populations including African Americans.

Role: Post-doc (2009-2011)

Hypergen: Genetics of Left Ventricular (LV) Hypertrophy

NIH/NHLBI 2 R01 HL055673-10 (PI: Arnett)

To further understand the genetic architecture of LV hypertrophy and related traits.

Role: Post-doc (2008-2009)

GenHAT – Genetics of Hypertension Associated Treatments

NIH/NHLBI R01 HL063082-05 (PI: Arnett)

To evaluate whether hypertension candidate genotypes can predict therapeutic response to antihypertensive therapy.

Role: Post-Doc (2008-2009)