

**ABEE BOYLES, PH.D.**  
 Epidemiology Branch  
 National Institute of Environmental Health Sciences  
 111 TW Alexander Drive, MD A3-05  
 Durham, NC 27709  
 P: (919) 541-7886, F: (919) 541-2511  
 Email: [boylesa@niehs.nih.gov](mailto:boylesa@niehs.nih.gov)

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## EDUCATION

**Duke University**, Ph.D. Program in Genetics and Genomics, 2006  
 Certificate in Bioinformatics and Genome Technology, 2004  
 Certificate in Teaching College Biology, 2006

**North Carolina State University**, B.S. Zoology, Minor in Genetics (summa cum laude) 1998

## SCIENTIFIC EXPERIENCE

**National Institute Environmental Health Sciences/ NIH**, Epidemiology Branch,  
 Post Doctoral Fellow (2006-present)  
 Folate genes and nutrition in facial clefts.

**Duke University**, Center for Human Genetics, Graduate Researcher (2001-2006)  
 Statistical genetics analysis in neural tube defects and Chiari Malformation I.

**GlaxoSmithKline**, Department of Receptor Biochemistry, Research Assistant (1999-2001)  
 High throughput screening in the melanophore lawn assay.

**North Carolina State University**, Department of Genetics, Research Assistant (1997-1999)  
 Molecular evolution of floral regulatory genes in cole cabbage crops.

**Centers for Disease Control and Prevention**, Research Intern (Summer 1998)  
 Metabolic gene expression in tuberculosis pathogenesis.

## HONORS

James B. Duke Fellowship, 2001  
 John T. Caldwell Alumni Scholarship, 1994  
 NSF Graduate Research Fellowship, Honorable Mention, 2003  
 Graduate School International Research Travel Award, 2004  
 AAAS /Science Program for Excellence – Duke University, 2005  
 25<sup>th</sup> Advanced Gene Mapping/Linkage Course Travel Grant, 2003  
 NCSU Summer Institute in Statistical Genetics Scholarship, 2004  
 Sigma Xi Undergraduate Symposium Award – Biological Research, 1998

## PUBLISHED WORK

**Boyles AL**, Enterline DS, Hammock PH, Siegel DG, Slifer SH, Mehlretter L, Hu-Lince D, Stephan D, Milhorat TH, Iskandar BJ, George TM, and Speer MC. (2006) A whole genome screen for Chiari malformation type I shows significant linkage to regions on chromosomes 9 and 15. *American Journal of Medical Genetics*. (in press)

**Boyles AL**, Billups AV, Deak KL, Siegel DG, Mehlretter L, Slifer SH, Bassuk AG, Kessler JA, Reed MC, Nijhout HF, George TM, Enterline DS, Gilbert JG, Speer MC, and the NTD Collaborative Group. (2006) Neural tube defects and folate pathway genes: family-based association tests of gene-gene and gene-environment interactions. *Environmental Health Perspectives* 114:1547-1552. (Science Selections comment by E. Hood pg A601)

**Boyles AL**, Scott WK, Martin ER, Schmidt S, Li YJ, Ashley-Koch A, Bass MP, Schmidt M, Pericak-Vance MA, Speer MC, and Hauser ER (2005) Linkage disequilibrium inflates Type I error rates in multipoint linkage analysis when parental genotypes are missing. *Human Heredity* 59: 220-227.

**Boyles AL**, Hammock P, and Speer MC (2005) Candidate Gene Analysis in Human Neural Tube Defects. *American Journal of Medical Genetics Part C: Seminars in Medical Genetics* 135:9-23.

Deak KL, **Boyles AL**, Etchevers HC, Melvin EC, Siegel DG, Graham FL, Slifer S, Enterline DS, George TM, Vekemans M, McClay D, Bassuk AG, Kessler JA, Linney E, Gilbert JR, Speer MC and the NTD Collaborative Group (2005) SNPs in the Neural Cell Adhesion Molecule 1 (*NCAM1*) may be associated with Human Neural Tube Defects. *Human Genetics* 117: 133-142.

Bammler T, Beyer RP, Bhattacharya S, Boorman GA, **Boyles A**, Bradford BU, Bumgarner RE, Bushel PR, Chaturvedi K, Choi D, Cunningham ML, Deng S, Dressman HK, Fannin RD, Farin FM, Freedman JH, Fry RC, Harper A, Humble MC, Hurban P, Kavanagh TJ, Kaufmann WK, Kerr KF, Jing L, Lapidus JA, Lasarev MR, Li J, Li YJ, Lobenhofer EK, Lu X, Malek RL, Milton S, Nagalla SR, O'Malley JP, Palmer VS, Pattee P, Paules RS, Perou CM, Phillips K, Qin LX, Qiu Y, Quigley SD, Rodland M, Rusyn I, Samson LD, Schwartz DA, Shi Y, Shin JL, Sieber SO, Slifer S, Speer MC, Spencer PS, Sproles DI, Swenberg JA, Suk WA, Sullivan RC, Tian R, Tennant RW, Todd SA, Tucker CJ, Van Houten B, Weis BK, Xuan S, Zarbl H, and Members of the Toxicogenomics Research Consortium. (2005) Standardizing global gene expression analysis between laboratories and across platforms. *Nature Methods*. 2:351-6.

Qin LX, Kerr K, and **Contributing Members of the Toxicogenomics Research Consortium**. (2004) Empirical evaluation of data transformations and ranking statistics for microarray analysis. *Nucleic Acids Research* 32:5471-5479.

Purugganan MD, **Boyles AL**, and Suddith, JI (2000). Variation and selection at the *CAULIFLOWER* floral homeotic gene accompanying the evolution of domesticated *Brassica oleracea*. *Genetics* 155:855-862.

**Lowman AC** and Purugganan MD (1999). Duplication of the *Brassica oleracea* *APETALA1* floral homeotic gene and the evolution of the domesticated cauliflower. *J. Heredity* 90: 514-520.

## CONFERENCE PRESENTATIONS

American Society of Human Genetics Annual Meeting, 2006

**Poster Presentation:** "Chiari type I malformation: phenotypic definition by MRI and significant linkage to 15q21.3 and 9q22.31 with a high-density SNP genomic screen." New Orleans, LA. **A.L. Boyles**, D.S. Enterline, P.H. Hammock, D.G. Siegel, S.H. Slifer, L. Mehlretter, J.R. Gilbert, D. Hu-Lince, D. Stephan, B.J. Iskandar, T.M. George, T.H. Milhorat, M.C. Speer.

Society of Toxicology Annual Meeting, 2006

**Invited Presentation:** "The relationship between folate deficiency, maize consumption, fumonisin intake, and genetic factors on neural tube defect incidence worldwide." San Diego, CA. **A.L. Boyles** spoke in place of: M. Speer, A. Wise, J.R. Gilbert, and J. Freedman.

American Society of Human Genetics Annual Meeting, 2005

**Poster Presentation:** "Neural tube defects and folate pathway genes: family-based association tests of gene-gene and gene-environment interactions." Salt Lake City, UT. **A.L. Boyles**, A.V. Billups, D.G.

Siegel, S.H. Slifer, M.C. Reed, H.F. Nijhout, T.M. George, A.G. Bassuk, J.A. Kessler, J.R. Gilbert, M.C. Speer, and NTD Collaborative Group.

American Society of Human Genetics Annual Meeting, 2004

**Platform Presentation:** “Linkage disequilibrium inflates Type I error rates in multipoint linkage analysis when parental genotypes are missing.” Toronto, Canada. **Boyles, A.L.**, Scott, W.K., Martin, E.R., Schmidt, S., Li, Y.J., Ashley-Koch, A., Bass, M.P., Pericak-Vance, M.A., Speer, M.C, and Hauser, E.R.

American Syringomyelia Alliance Project Annual Medical Conference, 2004

**Platform Presentation:** “Familial correlations, high density genomic screening, and expression analysis in Chiari Type I Malformation with or without Syringomyelia: A multifaceted approach to understanding etiology from a genetic and genomics perspective.” Miami, FL. **A.L. Boyles**, D.S. Enterline, P. Hammock, L. Mehlretter, J. Gilbert, T.M. George, and M.C. Speer.

Third Structural Birth Defects Meeting, 2004

**Presentation:** “Genomic Screening and Testing of Candidate Genes in Human Neural Tube Defects.” St. Louis, MO. Speer Marcy C., Rampersaud Evadnie, Bastress Kristen, **Boyles Abee L.**, Melvin Elizabeth C., George Timothy M., Swift Frances, Gilbert John R., and the NTD Collaborative Group.

Piedmont Genetic Epidemiology Society Meeting, 2003

**Presentation:** “Microarray Analysis in Pulmonary Fibrosis” Durham, NC. **Abee Boyles**

Annual Meeting: The Society for the Study of Evolution, et al., 1998

**Poster Presentation:** “Molecular Evolution and Flower Development Genes in *Brassica oleracea*: Patterns of Duplication and Variation.” University of British Columbia, Vancouver. **A.C. Lowman** and M.D. Purugganan.

## COURSES

Design and Analysis of DNA Microarray Studies – Jan. 23-25, 2003: New York, NY

25<sup>th</sup> Advanced Gene Mapping/Linkage Course – Dec. 8-12, 2003: New York, NY

NCSU Summer Institute in Statistical Genetics: Quantitative Genetics – May 31-Jun. 2, 2004: Raleigh, NC  
Microarray Analysis – Jun. 7-9, 2004: Raleigh, NC