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**EDUCATION AND EMPLOYMENT**

<b>National Toxicology Program, NIEHS</b> , Office of Health Assessment and Translation Health Scientist	2011-present
<b>National Toxicology Program, NIEHS</b> , Center for the Evaluation of Risks to Human Reproduction IRTA Post-Doctoral Fellow	2010-2011
<b>National Institute Environmental Health Sciences/ NIH</b> , Epidemiology Branch IRTA Post-Doctoral Fellow	2006-2010
<b>Duke University</b> , Ph.D. University Program in Genetics and Genomics	2006
Certificate in Teaching College Biology	2006
Certificate in Bioinformatics and Genome Technology	2004
<b>GlaxoSmithKline</b> , Department of Receptor Biochemistry, Research Assistant	1999-2001
<b>North Carolina State University</b> , B.S. Zoology, Minor in Genetics, summa cum laude	1998

**HONORS**

NIEHS Leadership Development Program, 2013  
 One-NIEHS Award, Science Day Organizing Committee, 2012  
 Fellows Award for Research Excellence (FARE), 2010  
 James B. Duke Fellowship, 2001-2005  
 John T. Caldwell Alumni Scholarship, 1994-1998

**SCIENTIFIC SERVICE**

Vitamin D Federal Working Group, 2013-present  
 NIEHS Science Day Organizing Committee, 2012-present  
 Cross-Divisional Implementation Plan: Scientific Data and Knowledge Management Workgroup, 2012-13  
 NIEHS Trainees Assembly (NTA) Steering Committee –2007-2011  
 NIEHS Strategic Planning Stakeholder Workshop Participant - 2011  
 NIEHS Division of Intramural Research Council – NTA representative 2008-2009  
 NIEHS Assembly of Scientists Council – NTA representative: 2008-2009, 2010-2011

**Peer Reviewer:** (selected list) American Journal of Clinical Nutrition, Birth Defects Research Part A, BMJ, Epidemiology, JAMA, The New England Journal of Medicine, PLoS ONE, Reproductive Toxicology

**PUBLISHED WORK**

Rooney AA, **Boyles AL**, Wolfe MS, Bucher JR, and Thayer KA. (2014) Systematic review and evidence integration for literature-based environmental health science assessments. *Environ Health Perspect.* 122: 711-718.

NTP Monograph on Health Effects of Low-level Lead (2012)

[http://ntp.niehs.nih.gov/NTP/ohat/Lead/Final/MonographHealthEffectsLowLevelLead\\_Final\\_508.pdf](http://ntp.niehs.nih.gov/NTP/ohat/Lead/Final/MonographHealthEffectsLowLevelLead_Final_508.pdf)

**Boyles AL**, Ballard JL, Gorman EB, McConnaughey DR, Cabrera RM, Wilcox AJ, Lie RT, and Finnell RH. (2011) Association between inhibited binding of folic acid to folate receptor  $\alpha$  in maternal serum and folate-related birth defects in Norway. *Hum Reprod.* 26: 2232-2238.

Jugessur A, Shi M, Gjessing HK, Lie RT, Wilcox AJ, Weinberg CR, Christensen K, **Boyles AL**, Daack-Hirsch S, Trung TN, Bille C, Lidral AC and Murray JC. (2011) Fetal genetic risk of isolated cleft lip only (CLO) versus isolated cleft lip and palate (CLP): A sub-phenotype analysis using two population-based studies of orofacial clefts in Scandinavia. *Birth Defects Res A Clin Mol Teratol.* 91:85-92.

**Boyles AL**\*, DeRoo LA\*, Lie, RT, Taylor JA, Jugessur A, Murray JC, Wilcox AJ. (2010) Maternal alcohol consumption, alcohol metabolism genes and the risk of oral clefts: a population based case-control study in Norway. *Am J Epidemiol.* 172: 924-931.

\*co-first authored

Jugessur A\*, Shi M\*, Gjessing HK, Lie RT, Wilcox AJ, Weinberg CR, Christensen K, **Boyles AL**, Daack-Hirsch S, Trung TN, Christiansen L, Lidral AC and Murray JC. (2010) Maternal genes and facial clefts in offspring: a comprehensive search for genetic associations in two population-based cleft studies from Scandinavia. *PLoS ONE.* 5: e11493.

\*co-first authored

Jugessur A\*, Shi M\*, Gjessing HK, Lie RT, Wilcox AJ, Weinberg CR, Christensen K, **Boyles AL**, Daack-Hirsch S, Trung TN, Bille C, Lidral AC and Murray JC. (2009) Genetic Determinants of Facial Clefting: Analysis of 357 Candidate Genes Using Two National Cleft Studies from Scandinavia. *PLoS ONE.* 4: e5385.

\*co-first authored

**Boyles AL**, Wilcox AJ, Taylor JA, Shi M, Weinberg CR, Meyer K, Fredriksen Å, Ueland PM, Johansen AMW, Drevon CA, Jugessur A, Trung TN, Gjessing HK, Vollset SE, Murray JC, Christensen K, and Lie RT. (2009) Oral facial clefts and gene polymorphisms in metabolism of folate/one-carbon and vitamin A: a pathway-wide association study. *Genet Epidemiol.* 33: 247-255.

**Boyles AL**, Wilcox AJ, Taylor JA, Meyer K, Fredriksen Å, Ueland PM, Drevon CA, and Lie RT. (2008) Folate and one-carbon metabolism gene polymorphisms and their associations with oral facial clefts. *Am J Med Genet A.* 146A: 440-449.

O'Grady G, **Boyles AL**, Speer MC, DeRuyter F, Strittmatter W, and Worley G. (2007) Apolipoprotein E alleles and sensorineural hearing loss. *Int J Audiol.* 46: 183-186.

**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. *Am J Med Genet A.* 140A: 2776-2785.

**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. *Environ Health Perspect.* 114: 1547-1552.

**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. *Hum Hered.* 59: 220-227.

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 (*NCAMI*) may be associated with Human Neural Tube Defects. *Hum Genet.* 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. *Nat 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. Hered.* 90: 514-520.

†published under maiden name

## EDITORIAL, REVIEW, LETTER, INVITED COMMENTARY AND BOOK CHAPTER

Thayer KA, Wolfe MS, Rooney AA, **Boyles AL**, Bucher JR, and Birnbaum LS. (2014) Intersection of systematic review methodology with the NIH Reproducibility Initiative. *Environ Health Perspect*. 122: A126

Taylor K, Novak R, Anderson H, Birnbaum L, Blystone C, Devito M, Jacobs D, Köhrle J, Lee D, Rylander L, Rignell-Hydbom A, Tornero-Velez R, Turyk M, **Boyles AL**, Thayer KA, and Lind L. (2013) Evaluation of the Association between Persistent Organic Pollutants (POPs) and Diabetes in Epidemiological Studies: A National Toxicology Program Workshop Review. *Environ Health Perspect*. 121:774-83.

**Boyles AL**, Harris SF, Rooney AA, and Thayer KA. (2011) Forest Plot Viewer: a fast, flexible graphing tool. *Epidemiology*. 22: 746-747.

**Boyles AL**. (2010) The quest for the elusive causative SNP. *Kidney Int*. 78: 9-10.

**Boyles AL**, Hammock P, and Speer MC (2005) Candidate Gene Analysis in Human Neural Tube Defects. *Am J Med Genet C: Semin Med Genet*. 135: 9-23.

## ORAL PRESENTATIONS

Society of Toxicology Annual Meeting, 2013

Sponsored Session “Implementing Systematic Review at the NTP” San Antonio, TX; **AL Boyles**, AA Rooney, MS Wolfe, and KA Thayer.

NIEHS and EPA Centers for Children's Environmental Health and Disease Prevention Research, 2012

Invited Talk “NTP Update: Systematic review incorporating data mining with graphical tools for researchers” Bethesda, MD; **AL Boyles**, AA Rooney, and KA Thayer.

Society for Risk Analysis Annual Meeting, 2011

Symposium Chair “Graphic Depictions of Toxicological Data” George Woodall and **Abee Boyles**

Symposium Talk “Software for displaying toxicological data at NTP: the Meta Data Viewer program” AA Rooney, **AL Boyles**, SF Harris, and KA Thayer.

FASEB Summer Conferences: Folic Acid, B12, and One-Carbon Metabolism, 2010

“Inhibited binding of folic acid to folate receptor  $\alpha$  in maternal serum and folate related birth defects in Norway.” Carefree, AZ. **AL Boyles**, JL Ballard, EB Gorman, DR McConnaughey, RM Cabrera, AJ Wilcox, RT Lie, and RH Finnell.

Society for Pediatric and Perinatal Epidemiologic Research, 2009

“Maternal alcohol consumption and infant clefts: the role of alcohol metabolism gene variants.” Anaheim, CA. **AL Boyles**, LA DeRoo, AJ Wilcox, JA Taylor, A Jugessur, K Christensen, JC Murray and RT Lie.

NIEHS Science Awards Day, 2007

“Folate and one-carbon metabolism gene polymorphisms and their associations with oral facial clefts.” Durham, NC. **AL Boyles**, AJ Wilcox, JA Taylor, M Shi, CR Weinberg, K Meyer, Å Fredriksen, PM Ueland, CA Drevon, K Solvoll, JC Murray, A Jugessur, and RT Lie.

American Society of Human Genetics Annual Meeting, 2004

“Linkage disequilibrium inflates Type I error rates in multipoint linkage analysis when parental genotypes are missing.” Toronto, Canada. **AL Boyles**, WK Scott, ER Martin, S Schmidt, YJ Li, A Ashley-Koch, MP Bass, MA Pericak-Vance, MC Speer, and ER Hauser.

American Syringomyelia Alliance Project Annual Medical Conference, 2004

“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. **AL Boyles**, DS Enterline, P Hammock, L Mehlretter, JR Gilbert, TM George, and MC Speer.

## POSTER PRESENTATIONS

International Society for Environmental Epidemiology Annual Conference, 2014

“Assessing risk of bias in observational studies for systematic reviews: applying the OHAT method in two case studies” Seattle, WA **AL Boyles**, KA Thayer, and AA Rooney.

SOT CCT Workshop “Building for Better Decisions” (B4BD), 2012

“Systematic Review Incorporating Data Mining with Graphical Tools for Researchers” Durham, NC **AL Boyles**, E Matovinovic, AA Rooney, MS Wolfe, and KA Thayer.

American Society of Human Genetics Annual Meeting, 2009

“Fetal genetic risk factors for isolated cleft lip only.” Honolulu, HI. A Jugessur, M Shi, H Gjessing, RT Lie, AJ Wilcox, CR Weinberg, K Christensen, **AL Boyles**, S Daack-Hirsch, T Trung Nguyen, C Bille, AC Lidral, JC Murray.

Society for Epidemiologic Research, 2009

“Maternal alcohol consumption and infant clefts: the role of alcohol metabolism gene variants.” Anaheim, CA. **AL Boyles**, LA DeRoo, AJ Wilcox, JA Taylor, A Jugessur, K Christensen, JC Murray and RT Lie.

American Society of Human Genetics Annual Meeting, 2007

“Folate metabolism genes and their associations with oral facial clefts.” San Diego, CA. **AL Boyles**, AJ Wilcox, JA Taylor, M Shi, CR Weinberg, K Meyer, Å Fredriksen, PM Ueland, CA Drevon, K Solvoll, JC Murray, A Jugessur, and RT Lie.

American Society of Human Genetics Annual Meeting, 2007

“Comprehensive analysis of 331 candidate genes for orofacial clefting in a population-based infant-parent case-control study from Norway.” San Diego, CA. A Jugessur, M Shi, H Gjessing, AJ Wilcox, RT Lie, CR Weinberg, TN Trung, AC Lidral, **AL Boyles**, K Christensen, JC Murray.

Society for Epidemiologic Research, 2007

“Folate metabolism genes and the risk of orofacial clefts.” Boston, MA. **AL Boyles**, AJ Wilcox, K Meyer, Å Fredriksen, PM Ueland, CA Drevon, K Solvoll, and RT Lie.

Society for Pediatric and Perinatal Epidemiologic Research, 2007

“Folate metabolism genes and the risk of orofacial clefts.” Boston, MA. **AL Boyles**, AJ Wilcox, K Meyer, Å Fredriksen, PM Ueland, CA Drevon, K Solvoll, and RT Lie.

American Society of Human Genetics Annual Meeting, 2006

“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. **AL Boyles**, DS Enterline, PH Hammock, DG Siegel, SH Slifer, L Mehlretter, JR Gilbert, D Hu-Lince, D Stephan, BJ Iskandar, TM George, TH Milhorat, MC Speer.

American Society of Human Genetics Annual Meeting, 2005

“Neural tube defects and folate pathway genes: family-based association tests of gene-gene and gene-environment interactions.” Salt Lake City, UT. **AL Boyles**, AV Billups, DG Siegel, SH Slifer, MC Reed, HF Nijhout, TM George, AG Bassuk, JA Kessler, JR Gilbert, MC Speer, and NTD Collaborative Group.

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

“Molecular Evolution and Flower Development Genes in *Brassica oleracea*: Patterns of Duplication and Variation.” University of British Columbia, Vancouver. **AC Lowman**† and MD Purugganan.

†presented under maiden name

## SPECIALTY COURSES

The Mary Frances Picciano Dietary Supplements Practicum– Jun 6-9, 2011: Bethesda, MD

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

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

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