

Katie Marie O'Brien, MSPH, PhD

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Contact Information

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Education

2013 PhD in Epidemiology with a minor in Biostatistics, Gillings School of Global Public Health, University of North Carolina at Chapel Hill (UNC)
Race and subtype differences in the replication of previously identified breast cancer susceptibility loci: A Bayesian approach [Co-chairs: Robert Millikan and Stephen Cole]

2010 MSPH, Epidemiology, Gillings School of Global Public Health, University of North Carolina at Chapel Hill

2005 BA, Williams College, Williamstown, MA
Double Major: Mathematics and Psychology

Work Experience

2018-present Staff Scientist, Epidemiology Branch, National Institute of Environmental Health Sciences (NIEHS), Research Triangle Park, NC

2013-2018 Post-doctoral fellow, Biostatistics and Computational Biology Branch, NIEHS, Research Triangle Park, NC (Primary mentor: Clarice R. Weinberg, PhD)

2011-2013 Intern, *Epidemiology*

2007-2012 Graduate Research Assistant, Department of Epidemiology, UNC
Mentors: Drs. Lawrence Engel (11-12), Robert Millikan (08-11), and Audrey Pettifor (07-08)

2005-2007 Data Manager (05-06), promoted to Regulatory Coordinator (06-07)
Clinical Trials Office, Division of Hematology and Medical Oncology
Weill Medical College of Cornell University, New York, NY

Honors and Awards

2017 NIEHS Intramural Paper of the Month (October) "Serum vitamin D and risk of breast cancer within five years"

2016 NIEHS Fellow of the Year

2016 Best oral presentation for "Serum vitamin D and risk of breast cancer within five years", 8th annual SPER/SER Day, National Institute of Environmental Health Sciences

2015 NIEHS Intramural Paper of the Month (November) "Environmental chemicals in urine and blood: Improving methods for creatinine and lipid adjustment"
Best poster presentation for "Environmental chemicals in urine and blood: Improving methods for creatinine and lipid adjustment", 7th annual SPER/SER Day, National Institute of Environmental Health Sciences

Mentoring and Teaching Experience

Pre-doctoral Trainees:

John Murphy, NIEHS Summers of Discovery 2018 as UNC doctoral student. Primary mentor on “Severe acne and risk of breast cancer”

Cuicui Wang, visiting pre-doctoral fellow through Graduate Partnerships Program
Co-mentor (Primary mentor: Clarice Weinberg) on “Predictive modeling of vitamin D”
Current position: Post-doctoral research fellow, Department of Epidemiology, Harvard TH Chan School of Public Health

Gloria Regalado, NIEHS Summers of Discovery 2016 as North Carolina State undergraduate
Co-mentor (with Clarice Weinberg) on “Perinatal and pregnancy-related risk factors for young-onset breast cancer”
Current Position: North Carolina State undergraduate, majoring in statistics and applied math
Winner: 2016 NIEHS Presentation Challenge

Nicole Gonzalez, NIEHS Summers of Discovery 2015 and part-time intramural research trainee (September 2015-September 2016) as UNC undergraduate
Co-mentor (with Clarice Weinberg) on “Talc use, douching and risk of ovarian cancer” and “Predictive modeling of vitamin D”
Current Position: graduated from UNC in 2017 with biostatistics major. Currently applying to biostatistics masters’ programs

Denis Whelan, NIEHS Summers of Discovery 2014 as Villanova undergraduate
Co-mentor (with Clarice Weinberg) on “Eating disorders, and breast cancer” and “Young-onset eating disorders and reproductive outcomes”
Current Position: PhD student, Department of Biostatistics and Bioinformatics, Rollins School of Public Health, Emory University

Jenny Sun, NIEHS Summers of Discovery 2013 as UNC undergraduate
Co-mentor (with Clarice Weinberg) on “Risk factors for young-onset breast cancer”
Current Position: PhD student, Department of Epidemiology, Harvard TH Chan School of Public Health

Teaching and Lecturing:

- Summer 2016 Co-lead journal club and science workshops for summer intern program
Instructor, “Biostatistics I: Introduction to Statistics and Experimental Design”, NIEHS (half-day course)
- Spring 2016 “Vitamin D and Breast Cancer in the Sister Study: An Epidemiology Example”. Guest lecture in “Rx for Science Literacy” presented by the North Carolina Association for Biomedical Research at the National Institutes of Environmental Health Sciences, Research Triangle Park, NC.
- Spring 2015 Co-Instructor for “Professional Development for Epidemiology Students”, Department of Epidemiology, UNC
- Spring 2014 Primary instructor for “Bayesian Methods in Epidemiology: Basic principles and applications”, Department of Epidemiology, UNC

- Fall 2013 “An introduction to Bayesian methods for epidemiologists.” Guest lecture in “Epidemiologic Analysis of Binary Data”, Dept of Epidemiology, UNC
- Spring 2010 Teaching Assistant, “Theory and Quantitative Methods in Epidemiology”, Department of Epidemiology, UNC
- 2004-2005 Teaching assistant, “Elementary Statistics and Data Analysis” and “Intermediate Statistics”, Williams College
- 2003-2004 Junior advisor (resident mentor in freshmen dormitory)
Teaching assistant, “Quantitative Studies”, and “Elementary Statistics and Data Analysis”
Tutor, calculus and statistics
Williams College
- 2002-2003 Tutor, calculus and statistics, Williams College

Peer-reviewed Publications

* Shared first author, † Student under my supervision, § Shared senior author

24. Schoemaker MJ, Nichols HB, Wright LB, Brook MN, Jones ME, **O’Brien KM**, ..., Dale P Sandler DP, Swerdlow AJ. Body-mass index, age and premenopausal breast cancer risk: A prospective analysis of 758,592 women. *In press, journal to be named later*.
23. **O’Brien KM**, Sandler DP, Shi M, Harmon QE, Taylor JA, and Weinberg CR. Genome-wide association study of 25-hydroxyvitamin D in US women. *Frontiers in Genetics*, 2018; 9: 1-11.
22. Hooper LG, Young MT, Keller JP, Szpiro AA, **O’Brien KM**, Sandler DP, Vedal S, Kaufman JD, London SJ. Ambient air pollution exposure and chronic bronchitis in a cohort of U.S. women. *Environmental Health Perspectives*, 2018; 126(2): 1-9.
21. **O’Brien KM**, Sandler DP, Kinyamu HK, Taylor JA, Weinberg CR. Single nucleotide polymorphisms in vitamin D-related genes may modify vitamin D-breast cancer associations. *Cancer Epidemiology, Biomarkers, and Prevention*, 2017; 26(12):1761-1771.
20. **O’Brien KM**, Sandler DP, Taylor JA, Weinberg CR. Serum vitamin D and risk of breast cancer within five years. *Environmental Health Perspectives*, 2017; 125(7):1-9.
19. **O’Brien KM**, Whelan DR†, Sandler DP, Hall JE, and Weinberg CR. Predictors and long-term health outcomes of eating disorders. *PLoS One*, 2017; 12(7): e0181104. doi:10.1371/journal.pone.0181104
18. Park YMM, White AJ, Nichols HB, **O’Brien KM**, Weinberg CR, and Sandler DP. The association between metabolic health, obese phenotype and the risk of breast cancer. *International Journal of Cancer*, 2017; 140(12):2657-2666.
17. Park YMM, **O’Brien KM**, Zhao S, Weinberg CR, Baird DD, and Sandler DP. Recurrent gestational diabetes is associated with an increased risk of breast cancer. *British Journal of Cancer*, 2017; 116(7):960-963.
16. **O’Brien KM**, Whelan DR†, Sandler DP, and Weinberg CR. Eating disorders, and breast cancer. *Cancer Epidemiology, Biomarkers, and Prevention*, 2017; 26(2): 206-211.
15. Shi M*, **O’Brien KM***, Sandler DP, Taylor J, Zaykin DV, and Weinberg CR. Previous GWAS hits in relation to young-onset breast cancer. *Breast Cancer Research and Treatment*, 2017; 161(2): 333-344.

14. Gonzalez N†, **O'Brien KM**, D'Aloisio AA, Sandler DP§, and Weinberg CR§. Talc use, douching and risk of ovarian cancer. *Epidemiology*, 2016; 27: 797-802.
13. **O'Brien KM***, Shi M*, Sandler DP, Taylor JA, Zaykin DV, Keller J, Wise AS, and Weinberg CR. A family-based, genome-wide association study of young-onset breast cancer: Germline variants and maternally-mediated effects. *European Journal of Human Genetics*, 2016; 24: 1316-1323.
12. **O'Brien KM**, Upson K, Cook NR, and Weinberg CR. Environmental chemicals in urine and blood: Improving methods for creatinine and lipid adjustment. *Environmental Health Perspectives*. 2016; 124(2): 220-227.
11. **O'Brien KM**, Sun J†, Sandler DP, DeRoo LA, and Weinberg CR. Risk factors for young-onset breast cancer. *Cancer Causes and Control*. 2015; 26: 1771-1778.
10. **O'Brien KM**, Fei C, Sandler DP, Nichols HB, DeRoo LA, and Weinberg CR. Hormone therapy and young-onset breast cancer. *American Journal of Epidemiology*. 2015; 181: 799-807.
9. **O'Brien KM**, Cole SR, Engel LS, Bensen JT, Poole C, Herring AH, and Millikan RC. Breast cancer subtypes and previously established genetic risk factors: A Bayesian approach. *Cancer Epidemiology, Biomarkers and Prevention*. 2014; 23: 84-97.
8. **O'Brien KM**, Cole SR, Poole C, Bensen JT, Herring AH, Engel LS, and Millikan RC. Replication of breast cancer susceptibility loci in whites and African-Americans using a Bayesian approach. *American Journal of Epidemiology*. 2014; 179: 382-94.
7. **O'Brien KM**, Orlow I, Antonescu CR, Ballman K, McCall L, DeMatteo R, and Engel LS. Gastrointestinal stromal tumors: a case-only analysis of single nucleotide polymorphisms and somatic mutations. *Clinical Sarcoma Research*. 2013; 3:12.
6. **O'Brien KM**, Orlow I, Antonescu CR, Ballman K, McCall L, DeMatteo R, and Engel LS. Gastrointestinal stromal tumors, somatic mutations and candidate genetic risk variants, *PLoS One*. 2013; 8(4):e62119. doi:10.1371/journal.pone.0062119
5. Mordukhovich I, Reiter PL, Backes DM, Family L, McCollough LE, **O'Brien KM**, Razzaghi H, and Olshan AF. A review of African American-white differences in risk factors for cancer: prostate cancer, *Cancer Causes and Control*. 2011; 3: 341-357.
4. **O'Brien KM**, Cole SR, Tse CK, Perou CM, Carey LA, Foulkes WD, Dressler LG, Geradts J, and Millikan RC. Intrinsic breast tumor subtypes, race, and long-term survival in the Carolina Breast Cancer Study, *Clinical Cancer Research*. 2010; 16: 6100-6110.
3. Pettifor A, **O'Brien K**, MacPhail C, Miller W, and Rees, H. Early coital debut and associated risk factors among young women and men in South Africa, *International Perspectives on Sexual and Reproductive Health*. 2009; 35 (2): 82-90.
2. Li T, Christos PJ, Sparano JA, Hershman DL, Hoschander S, **O'Brien K**, Wright JJ, and Vahdat LT. Phase II trial of the farnesyltransferase inhibitor tipifarnib plus fulvestrant in hormone receptor-positive metastatic breast cancer: New York Cancer Consortium Trial P6205, *Annals of Oncology*. 2009; 20: 642-647.
1. Gorgun E, Remzi FH, Montague DK, Conner JT, **O'Brien K**, Laparo B, and Fazio VW. Male sexual function improves after ileal pouch anal anastomosis, *Colorectal Disease*. 2005; 7:545-550.

Invited Commentaries, Reviews, and Book Chapters (not Peer-Reviewed)

1. **O'Brien KM**, Upson K, Buckley JP. Lipid and creatinine adjustment to evaluate health effects of environmental exposures. *Current Environmental Health Reports*. 2017; 4 (1): 44-50.

Forthcoming Manuscripts

* Shared first author, † Student under my supervision

Trabert B, Poole EM, ..., **O'Brien KM**, ..., Wentzensen N, and Tworoger SS, on behalf of the Ovarian Cancer Cohort Consortium (OC3). Frequent Aspirin, Nonsteroidal Anti-inflammatory Drug, and Acetaminophen Use and Risk for Ovarian Cancer: An Analysis in the Ovarian Cancer Cohort Consortium (OC3). *Preliminary acceptance, Journal of the National Cancer Institute*.

White AJ, **O'Brien KM**, Niehoff N, and Sandler DP. Hazardous Metallic Air Toxics and Breast Cancer Risk in a Nationwide Cohort Study. *In revision*.

O'Brien KM, Taylor JA, Sandler DP, Kinyamu HK, Xu Z, Weinberg CR. Vitamin D, DNA methylation, and breast cancer. *In revision*.

Grant DJ, Manichaikul A, ..., **O'Brien KM**, ..., Kennedy CJ, and Schildkraut JM. Evaluation of Vitamin D Receptor regulated genes reveals *UGT2A1/2* and *EGFR* polymorphisms associated with epithelial ovarian cancer in African American Women. *In review*.

White AJ, **O'Brien KM**, Jackson BP, Karagas MR. Urine and toenail cadmium levels in pregnant women: a validation study. *In review*.

O'Brien KM, White AJ, Sandler DP, Jackson BP, Karagas MR, Weinberg CR. Do post-breast cancer diagnosis toenail metal concentrations reflect pre-diagnostic levels? *In review*

O'Brien KM, Sandler DP, Taylor JA, and Weinberg CR. The influence of a breast cancer diagnosis on serum 25-hydroxyvitamin D. *In review*.

Geller RJ, Brotman RM, **O'Brien KM**, Fine DM, Zota AR. Phthalate Exposure and Odds of Bacterial Vaginosis among U.S. Reproductive-Aged Women, NHANES 2001-2004. *In review*.

O'Brien KM, White AJ, Jackson BP, Sandler DP, Karagas MR, and Weinberg CR. Toenail-based toxic metals and young-onset breast cancer. *In preparation*.

Nichols HB, Williams LA, Young K, Graff M, **O'Brien KM**, Troester M, Bensen J, Ambrosone C, Palmer J, and Olshan A. Genetic variants in anti-Müllerian hormone-related genes and breast cancer risk: Results from the AMBER consortium. *In preparation*.

Upson K, **O'Brien KM**, Hall JE, Baird DD. Association between urinary cadmium concentrations and follicle stimulating hormone in older reproductive-aged women and the impact of the urinary creatinine adjustment method on results. *In preparation*.

O'Brien KM, Shi M, D'Aloisio AA, Sandler DP and Weinberg CR. Perineal talc use, douching and the risk of endometrial cancer. *In preparation*.

Weinberg CR, Shi M, **O'Brien KM** and Umbach DM. Adjusting for urinary creatinine or serum lipids when analyte assays are based on pooled specimens. *In preparation*.

Kresovich JK, **O'Brien KM**, Sandler DP, Weinberg CR and Taylor JA. The importance of blood cell-type proportions in studying associations with telomere length. *In preparation*.

Fellowships, Grants, and Contracts

- 2017-2018 “The influence of β -carotene supplements, dietary and circulating carotenoids on oxidative stress, inflammation, and risk of postmenopausal breast cancer in the Sister Study” Office of Dietary Supplement Research Scholars Program (Co-Investigator; Principal Investigator: Yong-Moon Park)
- 2016- 2017 “Vitamin D levels over time and the risk of breast cancer” National Institute of Environmental Health Sciences, Division of Intramural Research (Post-doctoral fellow, Principal Investigator: CR Weinberg)
- 2015- 2017 “The Role of Cadmium and Other Trace Elements in Young-onset Breast Cancer” National Institute of Environmental Health Sciences, Division of Intramural Research (Post-doctoral fellow, Principal Investigator: CR Weinberg)
- 2014- 2015 Received \$100,000 grant for “The Joint Effects of Vitamin D, Genetics, and Epigenetics in the Prevention of Breast Cancer” from the Office of Dietary Supplement Research Scholars Program (Principal Investigator)
- 2011- 2013 Recipient of NIH Cancer Education and Career Development Program Institutional Training Grant (5R25CA057726-19)
- 2008- 2011 Recipient of NIH National Research Service Award Institutional Training Grant for Cancer Epidemiology (5T32CA009330-30)

Professional Service

Alumni Association Co-president, University of North Carolina at Chapel Hill, Department of Epidemiology (July 2016 to June 2017)

Reviewer for *The American Journal of Epidemiology*; *Epidemiology*; *Endocrine-related Cancer*; *International Journal of Molecular Sciences*; *Scientific Reports*; *PLoS One*; *International Journal of Environmental Research and Public Health*; *European Journal of Human Genetics*; *Cancer Epidemiology, Biomarkers and Prevention*; *British Journal of Cancer*; *Environmental Health Perspectives*, *Journal of the National Cancer Institute*; *Cancer Causes and Control*, *Nutrients*, *International Journal of Cancer*

NIEHS Trainees’ Assembly Steering Committee, Representative for the Biostatistics and Computational Biology Branch (May 2014-October 2016)

Society for Epidemiologic Research- Student and Post-Doc Committee, Membership and Nominations Committee Co-Chair (2009-2011); SER member since 2009

International Genetic Epidemiology Society- Next Generation, Co-Founder and board member (2011-2013); IGES website administrator (2012-2013)

Invited Talks

Genetic and Environmental Determinants of Breast and Ovarian Cancer, Epidemiology Branch, National Institute of Environmental Health Sciences, Research Triangle Park, NC, February 2017.

Vitamin D and Breast Cancer. School of Public Health, Division of Epidemiology and Community Health, University of Minnesota, Minneapolis, MN, December 2016.

The Joint Effects of Vitamin D, Genetics, and Epigenetics in the Prevention of Breast Cancer. Department of Epidemiology, University of North Carolina at Chapel Hill, NC, October 2016.

Vitamin D and Breast Cancer. Zilber School of Public Health, University of Wisconsin at Milwaukee, WI, January 2016.

The Joint Effects of Vitamin D, Genetics, and Epigenetics in the Prevention of Breast Cancer. Office of Dietary Supplements Research Scholars Symposium, National Institutes of Health, Bethesda, MD, November 2015.

Vitamin D and Breast Cancer. Department of Epidemiology, Geisel School of Medicine, Dartmouth College, Hanover, NH, October 2015.

Vitamin D and Breast Cancer. University of Washington School of Public Health, Department of Epidemiology, Seattle, WA, September 2015.

Breast cancer etiology: Moving from G to E to G by E. Division of Epidemiology, Department of Medicine, Vanderbilt University School of Medicine, Nashville, TN, July 2015.

Environmental biomarkers: Methods and applications. Epidemiology Branch, National Institute of Environmental Health Sciences, Research Triangle Park, NC, June 2015.

Environmental biomarkers: Methods and applications. Department of Epidemiology, Biostatistics and Occupational Health, McGill University, Montreal, Quebec, Canada, May 2015.

Environmental chemicals in urine and blood: Methods for creatinine and lipid adjustment. Biostatistics and Computational Biology Branch, National Institute of Environmental Health Sciences, Research Triangle Park, NC, April 2015.

Breast cancer etiology: Moving from G to E to G by E. Department of Epidemiology, University of California, Berkeley, CA, February 2015.

Breast cancer epidemiology: Heterogeneity by age, race, and genetic profile. Department of Epidemiology, Biostatistics and Preventive Medicine, University of New Mexico, Albuquerque, NM, August 2014.

Race and subtype differences in the replication of previously identified breast cancer susceptibility loci: A Bayesian approach. Biostatistics Branch Seminar, National Institute of Environmental Health Sciences, October 2012.

Conference Presentations

O'Brien KM, Taylor JA, Sandler DP, Xu Z, and Weinberg CR. The Joint Effects of Vitamin D Genetics and Epigenetics in the Prevention of Breast Cancer. Concurrent Contributed Session, Society for Epidemiologic Research, June 2017, Seattle, WA. (oral presentation)

O'Brien KM, Sandler DP, Taylor JA, and Weinberg CR. Serum Vitamin D and Breast Cancer within 5 years, Submitted Abstract Session, Society for Epidemiologic Research/Epidemiology Congress of the Americas, Miami, FL, June 2016. (oral presentation)

O'Brien KM, Sandler DP, Taylor JA, and Weinberg CR. Serum Vitamin D and Breast Cancer within Five Years. NIEHS Science Day, Research Triangle Park, NC, November 2015. (oral presentation)

O'Brien KM, Upton K, Cook N, and Weinberg CR. Environmental chemicals in urine and blood: Methods for creatinine and lipid adjustment. Society for Epidemiologic Research, June 2015. (poster)

O'Brien KM, Whelan DR, Hall JE, Sandler DP and Weinberg CR. Young-onset eating disorders, reproductive outcomes, and breast cancer. Society for Epidemiologic Research, June 2015. (poster)

- O'Brien KM, Upson K, Cook N, and Weinberg CR. Environmental chemicals in urine and blood: Methods for creatinine and lipid adjustment. NIEHS Science Day, November 2014. (poster)
- O'Brien KM, Fei C, Sandler DP, Nichols HB, DeRoo LA, and Weinberg CR. Hormone therapy and young-onset breast cancer. Society for Epidemiologic Research, June 2014. (poster)
- O'Brien KM, Sun J, Sandler DP, DeRoo LA, and Weinberg CR. Risk Factors for young-onset breast cancer. Society for Epidemiologic Research, June 2014. (poster)
- O'Brien KM, Cole SR, and Millikan RC. Breast cancer subtypes and previously established genetic risk factors: A Bayesian approach. Society for Epidemiologic Research, Boston, MA, June 2013. (oral presentation)
- O'Brien KM, Orlow I, Antonescu CR, Ballman K, McCall L, DeMatteo R and Engel LS. Gastrointestinal stromal tumors: linking single nucleotide polymorphisms and somatic mutations, Society for Epidemiologic Research, June 2013. (poster)
- O'Brien KM, Cole SR, Engel LS, Bensen JT, Poole C, Herring AH and Millikan RC. Breast cancer subtypes and previously established genetic risk factors: A Bayesian approach, American Society of Preventive Oncology, March 2013. (poster)
- O'Brien KM, Cole SR, Bensen, JT and Millikan RC. Race and subtype differences in the replication of previously identified breast cancer susceptibility loci, International Genetic Epidemiology Society, October 2012. (poster)
- O'Brien KM, Orlow I, Antonescu CR, Ballman K, McCall L, DeMatteo R and Engel LS. Gastrointestinal stromal tumors, somatic mutations and candidate genetic risk factors, International Genetic Epidemiology Society, October 2012. (poster)
- O'Brien KM, Millikan RC and Cole SR. Bayesian approaches to identifying susceptibility loci: A simulation study, International Genetic Epidemiology Society, September 2011. (poster)
- O'Brien KM, Hawkins LK, and Millikan RC. The association between cooked meat and breast cancer in a racially diverse population, Society for Epidemiologic Research, June 2011. (poster)
- O'Brien KM, Cole SR, and Millikan RC. Subtypes, race, and long-term survival in the Carolina Breast Cancer Study, Society for Epidemiologic Research, Seattle, WA, June 2010. (oral presentation)
- O'Brien KM, Cole SR, and Millikan RC. Subtypes, race, and long-term survival in the Carolina Breast Cancer Study, American Association for Cancer Research, April 2010. (poster)
- Ocean A, Schnoll-Sussman F, Chen X, Holloway S, Matthews N, O'Brien K, Christos P, Mazumdar M, Wright J, Wadler S. Phase II study of PS-341 (VELCADE, bortezomib) with or without irinotecan in patients with advanced gastric adenocarcinomas (AGA), American Society for Clinical Oncology- Gastrointestinal Cancers Symposium, January 2007. (poster)
- Ocean A, Ruggiero J, O'Brien K, Lee J, Holloway, S, Christos P, Kung TS, Kaubisch A, Chen H, Wadler, S. FOLFOX6 plus bevacizumab and cetuximab for metastatic colorectal cancer: New York Cancer Consortium Trial P6490, American Society for Clinical Oncology, June 2007. (poster)
- Li T, Christos P, Sparano J, Hershman D, Hoschander S, O'Brien K, Wright J, Vahdat L. Phase II study of the farnesyltransferase inhibitor tipifarnib plus fulvestrant in postmenopausal patients with hormone receptor-positive metastatic breast cancer: New York Cancer Consortium Trial P6205, American Society of Clinical Oncology, June 2007. (poster)