

Kathie Y. Sun

PHD CANDIDATE · STATISTICAL GENETICS

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Education

University of North Carolina, Chapel Hill (UNC-CH)

Chapel Hill, NC

Ph.D. candidate in Bioinformatics and Computational Biology (BCB)

2016 – 2021 (expected)

- Minor: Biostatistics

UNC-CH School of Public Health

Chapel Hill, NC

M.S.P.H. in Environmental Health Sciences

2014 – 2016

Duke University

Durham, NC

B.S. in Environmental Sciences and Biology

2008 – 2012

Research and Professional Experience

Valdar Lab, UNC-CH

Chapel Hill, NC

Graduate Research Assistant

2016 – 2021

- Defending in March 2021: *Statistical modeling of parent-of-origin effects and allelic imbalance in genetically-diverse mouse crosses*
- Developed Bayesian statistical models and novel computational pipelines to analyze large genomic (DNA- & RNA-seq) data sets
- Customized new methods to estimate genetic and environmental effects on complex behavioral phenotypes and gene expression in genetically-heterogeneous mice
- Presented work at international conferences, including The Allied Genetics Conference and the Gordon Research Conferences on Quantitative Genetics and Genomics; forthcoming manuscript is in press at *Genetics*

Cardno ChemRisk

Aliso Viejo, CA

Summer Intern

2015

- Conducted epidemiological meta-analysis of human clinical data to evaluate the profile of common or therapy-targetable mutations in lung cancers of never and ever smokers
- Designed study methodology, conducted statistical analysis, and drafted work for manuscript published in *Lung Cancer*

Nylander-French Lab, UNC-CH

Chapel Hill, NC

Graduate Research Assistant

2014 – 2016

- Thesis: *Influence of genetic variation on an occupational exposure assessment model of 1,6-hexamethylene diisocyanate*
- Designed linear mixed model containing whole-genome markers along with environmental exposure predictors to determine the contribution of individual genetic variants and their interactions to observed biomarker levels among exposed workers
- Presented work at the 2016 Society of Toxicology annual meeting in New Orleans, LA

National Human Genome Research Institute (NHGRI)

Rockville, MD

Scientific Program Analyst

2012 – 2014

- Synthesized data in support of NHGRI extramural grant portfolios
- Facilitated cooperation and collaboration between NHGRI Program Directors and academic researchers
- Consolidated information generated from meetings and coordinated 2-3 consortia meetings per year
- Conducted literature reviews resulting in 2 manuscripts

Communication and Teaching Experience

UNC-CH School of Public Health and Graduate School

Chapel Hill, NC

Teaching Assistant

2014 – 2018

- Helped teach two graduate-level core courses in (1) environmental health sciences and (2) statistical modeling
- Guided students toward understanding of difficult concepts, facilitated weekly discussions, and graded tests & homework

How To Learn To Code

Chapel Hill, NC

Instructor

2018

- Developed curriculum and materials for a introductory summer course on data analysis in R for biological scientists at UNC-CH
- Designed and provided feedback on homework assignments, assessments, and capstone projects

Varsity Tutors and ColPrep, Inc.

Chapel Hill, NC

Tutor

2015 – 2021

- Private tutoring for all levels of mathematics up through college-level calculus, including SAT & ACT prep and test-taking strategies
- Volunteered as a tutor for students in under-privileged communities around the Durham, NC area

Skills

Statistics

Probability & statistical inference, Bayesian methods, machine learning, data analysis & visualization

Programming & software

R, Python, Stan & JAGS, SAS, Unix, command line, Git, \LaTeX , Vim, Adobe Creative Suite, Microsoft Office

Publications

Bayesian modeling of skewed X inactivation in genetically diverse mice identifies a novel *Xce* allele associated with copy number changes

Kathie Y Sun, Daniel Oreper, Sarah A Schoenrock, Rachel McMullan, Paola Giusti-Rodríguez, Vasyl Zhabotynsky, Darla R Miller, Lisa M Tarantino, Fernando Pardo-Manuel Villena, William Valdar

Genetics (2021) In press, available at: <https://www.biorxiv.org/content/10.1101/2020.11.13.380535v2>

Lung cancer mutation profile of EGFR, ALK, and KRAS: Meta-analysis and comparison of never and ever smokers

Aaron M Chapman, **Kathie Y Sun**, Peter Ruestow, Dallas M Cowan, Amy K Madl

Lung Cancer 102 (2016) pp. 122–134

POLG2 disease variants: analyses reveal a dominant negative heterodimer, altered mitochondrial localization and impaired respiratory capacity

Matthew J Young, Margaret M Humble, Karen L DeBalsi, **Kathie Y Sun**, William C Copeland

Human Molecular Genetics 24.18 (2015) pp. 5184–5197

The ethical, legal, and social implications program of the National Human Genome Research Institute: reflections on an ongoing experiment

Jean E McEwen, Joy T Boyer, **Kathie Y Sun**, Karen H Rothenberg, Nicole C Lockhart, Mark S Guyer

Annual Review of Genomics and Human Genetics 15 (2014) pp. 481–505

Evolving approaches to the ethical management of genomic data

Jean E McEwen, Joy T Boyer, **Kathie Y Sun**

Trends in Genetics 29.6 (2013) pp. 375–382

Awards

2016 – 2021 **Caroline H. & Thomas S. Royster Fellowship**, UNC-CH Graduate School

2017 – 2018 **T32 Research Fellowship**, National Institute of General Medical Sciences

2016 **Student Scholarship**, American Industrial Hygiene Foundation

2014 – 2016 **T32 Research Fellowship**, National Institute of Occupational Safety and Health

2014 – 2015 **David Allison Fraser scholarship**, UNC-CH School of Public Health

2012 **Cum laude and Graduation with High Distinction in Biology**, Duke University

2008 – 2012 **Academic Scholarship**, Becton Dickinson Biosciences

Leadership Activities

2020 - 2021 **Committee Member**, Royster Distinguished Professor for Graduate Education Search Committee

Chapel Hill, NC

2019 - 2021 **Senator**, UNC-CH Graduate and Professional Students Federation

Chapel Hill, NC

2019 - 2021 **Committee Member**, BCB Students' Invited Speaker Seminar Series Committee

Chapel Hill, NC

2019 **Scientist Ambassador**, *DNA Day* teaching genetics in high school classrooms

Wilkesboro, NC

2017 **Conference Speaker and Participant**, Royster Global Conference at King's College London

London, UK

2015 - 2016 **Vice-President**, Environmental Sciences and Engineering Student Organization

Chapel Hill, NC

2008 - 2019 **Team Leader & Coxswain**, Duke Varsity Women's Rowing and Carolina Masters Club Crew

Durham, NC