Daniel E. Cook

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Education

Northwestern University **Evanston, IL**
Ph.D. Graduate Student – Interdisciplinary Program in Biological Sciences (IBiS) *2013-present*

University of Iowa **Iowa City, IA**
B.S. Biology with Honors *May 2010*

Experience

Andersen Lab, Northwestern University **Evanston, IL**
Graduate Student *2014–Present*

- Identified the gene and variant underlying natural variation in telomere length across the *C. elegans* species.
- Assembled, organized, and processed the largest collection of *C. elegans* wild isolate sequence data in existence.
- Developed several bioinformatic pipelines for processing whole-genome sequence data.
- Created a genome-wide association portal using cloud-based services for the *C. elegans* community (elegansvariation.org).
- Developed R and Python packages processing genetic data.
- Creation and maintenance of laboratory website (andersenlab.org).

Ober Lab, University of Chicago **Chicago, IL**
Research Assistant *2012-2013*

- Assisted with development of databases for phenotypic and genotypic data.
- Helped disclose carrier status to individuals.

Murray Lab, University of Iowa **Iowa City, IL**
Research Assistant *2009-2012*

- Leveraged supercomputing resources to explore maternal-fetal gene-gene interactions.
- Conducted geographic analysis of Iowa newborn screen data.
- Collected human placental tissue for genetic, epigenetic, and expression studies.

Honors and Awards

- **2015** - IBiS Travel Award ($975)
- **2015** - Northwestern TGS Conference Travel Grant ($600)
- **2014** - **NSF-GRFP:** National Science Foundation Graduate Research Fellowship
- **2006** - University of Iowa National Scholars Award

Teaching

- **Fall 2016** - *Biol. Sci. 390* - Advanced Molecular Biology
- **Spring 2015** - *Biol. Sci. 393* - Genetic Analysis
- **Summer 2014-2016** - IBiS Computational Biology Bootcamp

Computational Skills

Projects: GitHub.com/danielecook

Programming: Python, R, Bash, Stata, git

Web: Django, Flask, jQuery, Jekyll, HTML, Javascript, CSS

Cloud: AWS, Google Cloud Platform

Development: R, Python, Travis-CI

Database: SQL, BigQuery, Google Datastore

Genetic Analysis: Many command-line tools (bwa, samtools, bcftools, gatk, etc.), galaxy

Other: LaTeX, Slurm, Grid Engine, Nextflow, Sketch

Publications

2016 **The genome-wide abundance and distribution of transposons across the *Caenorhabditis elegans* species [Pending]**
Laricchia, Kristen M, Stefan Zdraljevic, **Daniel E Cook**, and Erik C Andersen
Dec. 2016.

Conserved Natural Genetic Variation in Topoisomerase II Affects Response to a Class of Chemotherapeutics [Pending]
Zdraljevic, Stefan, **Daniel E Cook**, Samuel K Rosenburg, Hannah S Seidel, and Erik C Andersen
Dec. 2016.

Natural variation in *Caenorhabditis* reveals role for heritable small RNAs in nematode benzimidazole resistance [Pending]
Zamanian, Mostafa, **Daniel E Cook**, Daehan Lee, Samuel K Rosenburg, Junho Lee, and Erik C Andersen
Dec. 2016.

VCF-kit: Assorted utilities for analyzing genetic variation [Accepted]
Cook, Daniel E and Erik C Andersen
Oct. 2016 *Bioinformatics*.

CeNDR, the *Caenorhabditis elegans* natural diversity resource
Cook, Daniel E, Stefan Zdraljevic, Joshua P Roberts, and Erik C Andersen
Oct. 2016 *Nucleic Acids Research*. PMID: 27701074 DOI: 10.1093/nar/gkw893.

The Genetic Basis of Natural Variation in *Caenorhabditis elegans* Telomere Length
Cook, Daniel E, Stefan Zdraljevic, Robyn E Tanny, Beomseok Seo, David D Riccardi, Luke M Noble, Matthew V Rockman, Mark J Alkema, Christian Braendle, Jan E Kammenga, John Wang, Leonid Kruglyak, Marie-Anne Félix, Junho Lee, and Erik C Andersen
Sept. 2016 *Genetics* (204(1):371-83). PMID: 27449056 DOI: 10.1534/genetics.116.191148.

2015 **DYRK1A controls the transition from proliferation to quiescence during lymphoid development by destabilizing Cyclin D3**
Thompson, Benjamin J, Rahul Bhansali, Lauren Diebold, **Daniel E Cook**, Lindsay Stolzenburg, Anne-Sophie Casagrande, Thierry Besson, Bertrand Leblond, Laurent Désiré, Sébastien Malinge, and John D Crispino
2015 *Journal of Experimental Medicine* 212.6. DOI: 10.1084/jem.20150002.

2013 **The influence of maternal disease on metabolites measured as part of newborn screening**
Ryckman, Kelli K, Oleg A Shchelochkov, **Daniel E Cook**, Stanton L Berberich, Sara Copeland, John M Dagle, and Jeffrey C Murray
Sept. 2013 *The J. of Maternal-Fetal & Neonatal Medicine* (26(14):1380-3). PMID: 23550828 DOI: 10.3109/14767058.2013.791267.

The heritability of metabolic profiles in newborn twins.
Alul, Farah Y, **Cook, Daniel E**, Oleg A Shchelochkov, Lauren G Fleener, Stanton L Berberich, Jeffrey C Murray, and Kelli K Ryckman

Mar. 2013 *Heredity* (110(3):253-8). PMID: 23149456 DOI: 10.1038/hdy.2012.75.

Clinical and environmental influences on metabolic biomarkers collected for newborn screening
Ryckman, Kelli K, Stanton L Berberich, Oleg A Shchelochkov, **Daniel E Cook**, and Jeffrey C Murray
Jan. 2013 *Clinical Biochemistry* (46(1-2):133-8). PMID: 23010448 DOI: 10.1016/j.clinbiochem.2012.09.013.

Generating Manhattan plots in Stata
Cook, Daniel E, Kelli R Ryckman, and Jeffrey C Murray
2013 *Stata Journal* (13(2):323-328).

2012 **Replication of clinical associations with 17-hydroxyprogesterone in preterm newborns**
Ryckman, Kelli K, **Daniel E Cook**, Stanton L Berberich, Oleg A Shchelochkov, Susan K Berends, Tamara Busch, John M Dagle, and Jeffrey C Murray
Jan. 2012 *J. of Ped. Endo. and Met.* (25(3-4):301-5). PMID: 22768660 DOI: 10.1515/jpem-2011-0456.

Presentations

2016 **The genetic basis of natural variation in *C. elegans* telomere length**
Selected Talk – International Conference on Quantitative Genetics, Madison WI.

The *C. elegans* natural diversity resource
Selected Talk – Midwest *C. elegans* meeting
Van Andel Research Institute, Grand Rapids, MI.

Variation in *pot-2* associated with differences in telomere length in *C. elegans*
Talk – OncDevBio Departmental Seminar, Northwestern University.

2015 **Genome-Wide and Species-Wide Variation in *C. elegans* Reveals Association of Telomere Length With Population Differences in *pot-2***
Selected Talk – International Worm Meeting 2015, UCLA.

Examining Genomic Variation in *C. elegans*
Talk – OncDevBio Departmental Seminar, Northwestern University.

2012 **Mapping Newborn Screen Data: A Geographic Exploration**
Poster – Pediatric Academic Societies Meeting, Boston, MA.

Professional Activities

- **2015, 2016** - NSF Data Science Workshop @ University of Washington

Software

My Github profile features additional projects I have been involved in as well: GitHub.com/danielecook

Python Packages

- VCF-kit - Assorted utilities for analyzing genetic variation.
- CeNDR - Web-based portal written in Flask. Provides users interactive interface for browsing and ordering *C. elegans* strains, examining their genetic variation, and performing genome-wide association using cloud-based pipelines. (elegansvariation.org).

R Packages

- rdatastore - provides an R-based interface for Google Datastore.
- memoise - [contribution] developed functionality for caching function results (memoisation) using cloud-based enviornments such as Amazon S3.

Stata Programs

- manhattan - Generation of Manhattan plots.
- ccmatch - Utility for case/control studies.

Mentorship

Joshua Roberts, 2015-2016 - *Computer Science (CS) Undergraduate* - Helped further develop Python and web-application development skills. Joshua now works at Motivate International.
Rohit Rastogi, 2016-present - *CS Undergraduate* - Fostered development of programming skills in R and Python.
Michael Jiang, 2016-present - *CS Undergraduate* - Furthered knowledge of web development, programming, and understanding of SQL databases.

Volunteer Activities

Americorps **Boston, MA**
Volunteer *2010-2011*

- Worked for ten months on a team with 15 fellow volunteers at the Maurice J. Tobin K-8 school.
- Tutored and mentored a 6^{th}-grade classroom.
- Helped run an after-school program in partnership with community organizations.

Table-To-Table (2007-2010) - Salvaged food every week from grocery stores and distributors in central Iowa for distribution at area food pantries.
Appalachia Service Project - Went on eight annual one-week trips during high-school and college to make homes safer, warmer, and drier for disadvantaged families in the Appalachian mountains of Kentucky and Tennessee.
Alpha Phi Omega - Member, 3.5 years; Engaged in a large variety of volunteer work, including performing environmental cleanups and teaching first-aid.