Eric Scott Davis
CURRICULUM VITAE

The University of North Carolina at Chapel Hill
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CONTACT INFORMATION

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EDUCATION

The University of North Carolina at Chapel Hill, School of Medicine

Ph.D. in Bioinformatics and Computational Biology, expected 2023

Advisor: Douglas H. Phanstiel
Written exam: PASSED
Oral exam: TBD

The University of North Carolina at Chapel Hill, College of Arts and Sciences

B.S. in Biology and B.A. in Chemistry, 2012 – 2016

Cumulative GPA: 3.576

GRADUATE RESEARCH EXPERIENCE

Phanstiel Lab, Graduate Research Assistant SPRING|2019 – PRESENT

- Conducted multi-omic data analysis in collaboration with Greg Wang's lab to investigate the phase-separation-induced changes in chromosomal architecture in response to a carcinogenic fusion protein.
- Developed Lure: an online, interactive software application for designing and visualizing oligonucleotide probes for hybrid-capture Hi-C (http://phanstiel-lab.med.unc.edu/lure).

Dominguez Lab, Rotation Student WINTER, 14 WEEKS|2019

- Used computational and wet-lab techniques to explore the autoregulatory interactions between the intrinsically disordered, phase-separation domains of proteins and their precursor mRNA structures.

Vincent Lab, Rotation Student FALL, 10 WEEKS|2018

- Conducted statistical analysis of metastatic melanoma microarray data to determine prognostically favorable tumor microenvironments in metastatic brain melanoma patients.
- Assessed the efficacy of chitosan-IL12 and neoantigen-derived vaccine combination immunotherapy in a bladder cancer mouse model. Began building a computational model to investigate tumor cell survival dynamics.

PREVIOUS RESEARCH EXPERIENCE

Research Technician   2016-2018
Marsico Lung Institute/UNC Cystic Fibrosis Research Center
- Conducted several research projects under Robert Tarran, Ph.D.
- Generated, analyzed, and prepared data resulting in several publications.
- Designed, built, and managed an online e-liquid safety database in collaboration with *Deep Green Software* (https://www.eliquidinfo.org).
- Mentored undergraduate, graduate, and rotation students.
- Developed novel protocols for exposure of cultured cells to e-liquid aerosol.
- Performed a variety of specialized techniques including high-throughput screening, Ussing chambers, confocal microscopy, rodent surgery, and cell culture.

Undergraduate Researcher   2015-2016
The University of North Carolina at Chapel Hill
- Conducted independent research projects under Dr. Robert Tarran, Dr. Robert Fellner, and Dr. Tongde Wu.
- Investigated electrophysiological responses of primary airway epithelial cell cultures to treatments with peptide inhibitors.
- Used confocal microscopy to assess the ability for peptides to inhibit STORE-operated calcium release in HEK293 cells.

GRANTS & FUNDING

Bioinformatics & Computational Biology T32 Training Grant   07|2019 – 06|2020
Partial stipend, tuition and health insurance coverage

Graduate Student Transportation Grant   SPRING|2019
$1,000 Travel award

HONORS & AWARDS

Poster Presentation Award   09|2019
UNC Department of Genetics Retreat

1st Place Predoctoral Poster Award   05|2019
Visiting Pulmonary Scholars Symposium

Dean's List Academic Honors   08|2012 - 05|2016
Eight semesters

TEACHING & MENTORING

First Year Group (FYG) Peer Mentor   08|2019 - PRESENT
FYG peer mentors meet with first year UNC graduate students and
advise students about choosing rotations, selecting dissertation labs,
and on having a successful graduate student experience.

Teaching Assistant, BCB720: Introduction to Statistical Modeling   FALL|2019
Responsibilities include teaching a class introducing/reviewing R, latex,
calculus, and linear algebra, holding regular office hours, and grading
homework assignments.

Teacher for How to Learn to Code   SUMMER|2019
How to Learn to Code (HTLTC) is a student-led summer program
designed to introduce the fundamentals of coding to biological
researchers (students/postdocs/faculty/staff). HTLTC offers classes in
beginning, and intermediate programming in both R and python.

Instructor for DNA Day   04|2019
DNA day commemorates the completion of the Human Genome Project
in 2003 and the discovery of DNA structure in 1953. On DNA day, UNC
sends graduate students, postdocs, faculty and staff to high schools
around North Carolina to teach about genomic research.

ORAL PRESENTATIONS
TCORS Annual Retreat   2017
Rizzo Conference Center, UNC-Chapel Hill
"The Physio-Chemical Properties of E-liquids"

POSTER PRESENTATIONS
CSHL: Epigenetics & Chromatin   2020
Virtual Conference
Attended – no poster presentation

UNC Department of Genetics Retreat   2019
Wilmington, NC
"Lure: A Probe Design Tool for Hybrid Capture Hi-C (Hi-C^2)"

Keystone Symposium 3D Genome: Gene Regulation and Disease   2019
Banff, AB, Canada
"LURE: Automated probe design for Hybrid Capture Hi-C (Hi-C^2)"

TCORS National Conference   2017
NIH Campus, Bethesda, MD
"Physio-chemical Properties of E-liquids as Biomarkers of Harm"

Visiting Pulmonary Scholars Symposium   2017
Friday Center, UNC-Chapel Hill
1st place in the predoctoral category

TCORS National Conference   2016
NIH Campus, Bethesda, MD
"Evaluating E-liquid Toxicity with an Open-source High-throughput Screening Method"

TCORS Annual Retreat   2016
Rizzo Conference Center, UNC-Chapel Hill
"Evaluating Toxicity and Electrophysiological Effects of E-liquids"

PUBLICATIONS

Dimitri G. Trembath, **Eric S. Davis**, Shanti Rao, Evan Bradler, Angelica F.   Submitted
Saada, Bentley R. Midkiff, Anna C. Snavely, Matthew G. Ewend, Frances A.   09|2020
Collichio, Carrie B. Lee, Georgia-Sofia Karachaliou, Fatih Ayvali, David W.
Ollila, Michal T. Krauze, John M. Kirkwood, Benjamin G. Vincent, Nana
Nikolaishvilli-Feinberg, Stergios J. Moschos. Brain Tumor Microenvironment
and Angiogenesis in Melanoma Brain Metastases. *Frontiers in Oncology,
Submitted, 2020.*

Arunava Ghosh, Ozge Beyazcicek, **Eric S. Davis**, Rob U. Onyenwoke, Robert   Accepted
Tarran. Cellular Effects of Nicotine Salt-Containing E-liquids. *Journal of   08|2020
Applied Toxicology*. 2020. DOI:10.1002/jat.4060

Jeong Hyun Ahn , **Eric Davis** , Timothy Daugird , Ivana Quiroga , Jie Li ,   Under Review
Aaron Storey , Samuel G Mackintosh , Ricky Edmondson , Stephanie Byrum ,   01|2020
Yihsuan Tsai , Alan Tackett , Deyou Zheng , Wesley Legant , Douglas
Phanstiel, Gang Greg Wang. A phase separation mechanism underscores
development of cancer and aberrant organization of three-dimensional
chromatin structure. *Nature, Under Review.* (2020)

Patwardhan MN, Wenger CD, **Davis ES**, Phanstiel DH. Bedtoolsr: An R   12|2019
package for genomic data analysis and manipulation. Journal of Open Source
Software, 4(44), 1742, https://doi.org/10.21105/joss.01742

Min A, Deoudes E, Bond ML, **Davis ES**, Phanstiel DH. CoralP: Flexible   12|2019
visualization of the human phosphatome. Journal of Open Source Software,
4(44), 1837, https://doi.org/10.21105/joss.01837

Davis ES*, Sassano MF*, Keating JE, et al. Evaluation of e-liquid toxicity 03|2018
using an open-source high-throughput screening assay. *PLOS Biology*.
2018;16(3):e2003904. doi:10.1371/journal.pbio.2003904

Ghosh A, Coakley RC, Mascenik T, Rowell TR, **Davis ES**, et al. Chronic E-   02|2018
Cigarette Exposure Alters the Human Bronchial Epithelial Proteome. *Am J
Respir Crit Care Med*. 2018;198(1):67-76. doi:10.1164/rccm.201710-2033OC

Matson BC, Pierce SL, Espenschied ST, Holle E, Sweatt IH, **Davis ES**, et al.   08|2017
Adrenomedullin improves fertility and promotes pinopodes and cell junctions
in the peri-implantation endometrium. *Biol Reprod*. 2017;97(3):466-477.
doi:10.1093/biolre/iox101

Davis ES, Sassano MF, Goodell H, Tarran R. E-Liquid Autofluorescence can be used as a Marker of Vaping Deposition and Third-Hand Vape Exposure. *Scientific Reports*. 2017;7(1):7459. doi:[10.1038/s41598-017-07862-w](10.1038/s41598-017-07862-w)   08|2017

GRADUATE COURSEWORK

FALL|2018
BCB 710 Bioinformatics Colloquium	P
BCB 715 Bioinformatics and Mathematics Modeling	H
BCB 716 Bioinformatics and Sequencing Analysis	P
BCB 720 Introduction to Statistical Modeling	H
BCB 722 Topics in Population Genetics	H

SPRING|2019
BCB 710 Bioinformatics Colloquium	P
BCB 717 Structural Bioinformatics	P
BCB 718 Computational Modeling Laboratory	P
BCB 785 Statistical Methods for Gene Expression Analysis	P
GNET 749 Practical RNA-Seq	H

FALL|2019
BCB 710 Bioinformatics Colloquium	P
BIOC 702 Advanced Topics in Chromatin and Epigenetics	H
COMP 410 Data Structures	H
INLS 641 Visual Analytics	H

BCB Written Exam|May 7-10, 2019
Dynamic Modeling A1	H
Dynamic Modeling A2	P
Evolutionary & Functional Genomics B1	H
Evolutionary & Functional Genomics B2	H
Quantitative Genetics C1	H

BBSP FIRST YEAR GROUP FACULTY CO-MENTORS
Ben Major	benmajor@med.unc.edu
Greg Wang	greg_wang@med.unc.edu
Natasha Snider	natasha_snider@med.unc.edu
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Mike Bressan	michael_bressan@med.unc.edu
Doug Phanstiel	douglas_phanstiel@med.unc.edu

REFERENCES
Douglas Phanstiel, Ph.D.   douglas_phanstiel@med.unc.edu
Assistant Professor of Cell Biology & Physiology, UNC-CH

Benjamin Vincent, MD   benjamin_vincent@med.unc.edu

Assistant Professor,
Division of Hematology/Oncology, UNC-CH

Daniel Dominguez, Ph.D.   didoming@email.unc.edu
Assistant Professor of Pharmacology, UNC-CH

Robert Tarran, Ph.D.   robert_tarran@med.unc.edu
Professor of Cell Biology & Physiology, UNC-CH