Curriculum Vitae
Robert W. Corty

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EDUCATION

residency Vanderbilt University Medical Center — **June 2022 (expected)**
specialty: internal medicine

MD University of North Carolina at Chapel Hill — **May 2020**

PhD University of North Carolina at Chapel Hill — **August 2018**
curriculum: Bioinformatics and Computational Biology
dissertation: Variance Heterogeneity in Genetic Mapping

AB Harvard University, Cambridge, Massachusetts — **May 2010**
concentration: Chemical and Physical Biology
thesis: Studies on the Oligomerization of the Dengue Envelope Protein

STANDARDIZED TESTING

USMLE Step 1: 231
USMLE Step 2 CK: 251
USMLE Step 2 CS: pass
USMLE Step 3: 236

RESEARCH

Independent — **2018 – 2020**
I investigated the effect of antibiotics on the risk for developing gemcitabine-associated toxicities by re-purposing the data from clinical trial of patients with stage IV pancreatic cancer.

Supervised by Dr. William Valdar — **2013 – 2018**
Dissertation project: Variance Heterogeneity in Genetic Mapping
I investigated the use of the double generalized linear model in genetic mapping of experimental crosses. I found that this model has two advantages as compared to traditional approaches: (1) it re-weights observations based on their empirical precision and (2) it detects genetic loci that influence residual variance, so-called ''vQTL''.
Related project: I derived a novel procedure for efficiently fitting a linear mixed model with arbitrary genetic covariance and heterogeneous residual variance, which has applications in genetic mapping.

Supervised by Dr. Stephen Harrison 2007 – 2010
I designed, cloned, expressed, purified, and refolded protein constructs to recapitulate various steps of process by which the dengue virus fuses its membrane with a host cell. This research was supported by HHMI and NIH and led to my senior thesis, which won the Thomas Temple Hoopes prize for outstanding undergraduate work.

GRANT SUPPORT

University Cancer Research Fund MD/PhD Scholarship — **2019** – **2020**

National Research Service Award: F30MH108265 — **2016** – **2019**
title: Statistical Modeling of Genetic Effects on Behavior and its Variability

UNC Big Data to Knowledge training grant: T32LM012420 **2015** – **2016**

UNC Bioinformatics and Computational Biology training grant: T32GM067553 **2014** – **2014**

UNC Medical Scientist Training Program: T32GM008719 **2011** – **2012**

PUBLICATIONS

1. **Corty, RW**, Langworthy BW, Fine JP, Buse JB, Sanoff HK, and Lund JL. Antibacterial use is associated with an increased risk of hematologic and gastrointestinal adverse events in patients treated with gemcitabine for stage IV pancreatic cancer. Oncologist 2020;25.

2. Mosedale M, Cai Y, Eaddy JS, **Corty, RW**, Nautiyal M, Watkins PB, and Valdar W. Identification of Candidate Risk Factor Genes for Human Idelalisib Toxicity Using a Collaborative Cross Approach. Toxicological Sciences 2019;172:265–78.

3. **Corty, RW** and Valdar W. QTL Mapping on a Background of Variance Heterogeneity. G3: Genes, Genomes, Genetics 2018;8:3767–82.

4. **Corty, RW** and Valdar W. vqtl: An R package for Mean-Variance QTL Mapping. G3: Genes, Genomes, Genetics 2018;8:3757–66.

5. **Corty, RW**, Kumar V, Tarantino LM, Takahashi JS, and Valdar W. Mean-Variance QTL Mapping Identifies Novel QTL for Circadian Activity and Exploratory Behavior in Mice. G3: Genes, Genomes, Genetics 2018;8:3783–90.

6. Mosedale M, Kim Y, Brock WJ, Roth SE, Wiltshire T, Eaddy JS, Keele GR, **Corty, RW**, Xie Y, Valdar W, et al. Editor's Highlight: Candidate Risk Factors and Mechanisms for Tolvaptan-Induced Liver Injury Are Identified Using a Collaborative Cross Approach. Toxicological Sciences 2017;156:438–54.

7. Green AK*, **Corty, RW**, Wood WA, Meeneghan M, Reeder-Hayes KE, Basch E, Milowsky MI, and Dusetzina SB. Comparative effectiveness of mitoxantrone plus prednisone versus prednisone alone in metastatic castrate-resistant prostate cancer after docetaxel failure. The Oncologist 2015;20:516–22.

8. Green AK, Reeder-Hayes KE, **Corty, RW**, Basch E, Milowsky MI, Dusetzina SB, Bennett AV, and Wood WA. The project data sphere initiative: accelerating cancer research by sharing data. The Oncologist 2015;20:464–e20.

9. Matson BC, **Corty, RW**, Karpinich NO, Murtha AP, Valdar W, Grotegut CA, and Caron KM. Midregional pro-adrenomedullin plasma concentrations are blunted in severe preeclampsia. Placenta 2014;35:780–3.

10. Corty EW and **Corty, RW**. Setting sample size to ensure narrow confidence intervals for precise estimation of population values. Nursing Research 2011;60:148–53.

ORAL PRESENTATIONS

UNC Quality Improvement Symposium **2020**
title: Equalizing the Workload Among UNC Hospitalists

Dissertation Defense **2018**
title: Variance Heterogeneity in Genetic Mapping

MD-PhD Association for Clinical Research Outcomes **2018**
title: Patients taking gemcitabine for metastatic pancreatic cancer have an increased risk of gemcitabine toxicity while on incidental antibiotics.

MS3 Quality Improvement Project **2018**
title: Improving Hypertension Management at Moncure Community Health Center

UNC Bioinformatics Colloquium **2017**
title: Recognizing Idiosyncrasy in Environmental Variation to Improve QTL Mapping

Triangle Statistical Genetics Conference **2016**
title: Two Reasons to Model Phenotype Mean and Variance in QTL Mapping

MD-PhD student session at the Annual Molecular Psychiatry Association Meeting **2014**
title: Variance Variants

UNIVERSITY SERVICE

MD-PhD admissions committee member **2016 – 2019**

student representative for Bioinformatics and Computation Biology curriculum recruitment **2016 – 2017**

team captain in MD-PhD program ''vertical mentorship'' system **2015 – 2017**

John B. Graham society for medical student research, secretary **2014 – 2016**

guest lecturer for high dimensional data analysis course **2015**

teaching assistant for Introduction to Statistical Modeling **2014**

COMMUNITY SERVICE

organizer and speaker, NAACP Historic Thousands on Jones Street **2016 – 2017**

volunteer, Homestart residential facility for women and children **2012 – 2014**

guest teacher, Brier Creek Elementary School wellness week **2013**

intake coordinator, St. Petersburg Free Clinic **2010 – 2011**

POSTER PRESENTATIONS

* = presenter

UNC Pediatrics Day of Scholarship, Chapel Hill, NC **2019**
title: Seize the diagnosis
authors: Pamela Londres*, **Corty, RW**, and William Mills

Society of Toxicology Annual Meeting, Baltimore, MD **2019**
title: Identification of Genetic Risk Factors for Human Idelalisib Toxicity Using a Collaborative Cross Approach
authors: Merrie Mosedale*, Yanwei Cai, J Scott Eaddy, **Corty, RW**, William Valdar, and Paul Watkins

UNC Quality Improvement Dinner **2018**
title: Optimizing Blood Pressure Recheck Protocol
authors: Amir Ghodka*, Mercedes Yoder, Joan East, . . . , Nicholas Alexander, and **Corty, RW**.

UNC Quality Improvement Dinner **2018**
title: Improving Hypertension Management at Moncure Community Health Center

authors: **Corty, RW***, Angelia Flanagan, Joan East, Nicholas Alexander, and Jan Lee Santos

American Society of Human Genetics **2017**
title: Evaluating the role of genetic variants on blood cell count variability in the Jackson Heart Study
authors: Jessica Shaw*, **Corty, RW**, Laura Raffield, . . . , Leslie Lange, William Valdar, and Ethan Lange

National MD-PhD Student Keystone Conference **2017**
title: How and Why To Model Heteroscedasticity in Mouse Genetics and Personalized Medicine
authors: **Corty, RW***, Jessica Shaw, Laura Raffield, Leslie Lange, Ethan Lange, and William Valdar

International College of Quantitative Genetics **2016**
title: Jointly Modeling Phenotype Mean and Variance for Robust (m|v|mv)QTL Mapping
authors: **Corty, RW***, Janice S. Bailey, Lisa M. Tarantino, and William Valdar

Society of Toxicology Annual Meeting **2015**
title: Risk Factors for Tolvaptan-Induced Liver Injury Are Identified Using a Collaborative Cross Approach
authors: Merrie Mosedale*, Darol E. Dodd, **Corty, RW**, Yuying Xie, William Valdar, and Paul B. Watkins

Gordon Research Conference on Quantitative Genetics **2015**
title: Identification of QTL that Control Mean and Variability of Murine Anxiety Traits in a Pair of F2 Crosses
authors: **Corty, RW***, Robin Ervin, Lisa M Tarantino, and William Valdar

Complex Trait Consortium **2015**
title: Identification of QTL that Control Mean and Variability of Murine Anxiety Traits in a Pair of F2 Crosses
authors: **Corty, RW***, Robin Ervin, Lisa M Tarantino, and William Valdar

UNC Genetics Department retreat **2013**
title: Inbred Strain Association for Anxiety Behaviors in 45 Classical and Wild Mouse Strains
authors: **Corty, RW***, Robin Ervin, Lisa M Tarantino, and William Valdar

AWARDS

NINDS travel award to attend MD-PhD student conference in Washington, D.C. **2015**

USDA scholarship to attend Gordon Research Conference on quantitative genetics in Barga, Italy **2015**

NIMH award to attend Molecular Psychiatry annual meeting in San Francisco, CA **2014**

Jackson Lab scholarship to attend short course in systems genetics in Bar Harbor, ME **2014**

Thomas Temple Hoopes prize for outstanding senior thesis **2010**