

**Education**

- **University of North Carolina** Chapel Hill, NC  
*Ph.D. Biostatistics* 2015 - 2020
  - Concentration in computational genomics, statistical genetics, and genetic epidemiology with an emphasis in health disparities
- **University of North Carolina** Chapel Hill, NC  
*B.S. Mathematical Decision Sciences, B.S. Biology* 2011 - 2015
  - Mackenzie Family Foundation Innovation Scholarship (full scholarship, 4 years)

**Research and Work Experience**

- **UCLA Institute for Quantitative and Computational Biosciences** Los Angeles, CA  
*Fellow* July 2021 - present
  - Teaching workshops in quantitative methods to biology researchers
  - Collaborating and consulting with experimental labs at UCLA for quantitative analyses
- **Department of Pathology and Laboratory Medicine** Los Angeles, CA  
*Postdoctoral Fellow* August 2020 - present
  - Developing methods for integration of genetic association studies and functional genomics
  - Studying the genetic and genomic contributions to neuropsychiatric disease and cancer etiology, progression, and disparities
  - With Prof. Bogdan Pasaniuc and Prof. Michael Gandal
- **Carolina Breast Cancer Study** Chapel Hill, NC  
*Research Assistant* August 2017 - August 2020
  - Elucidating the relationship between germline genetic variation and breast cancer tumor biology to study racial disparities in breast cancer outcomes
  - Developing methods for the deconvolution of bulk tumor RNA
  - With Prof. Michael Love and Prof. Melissa Troester
- **ELGAN-ECHO Research Study** Chapel Hill, NC  
*Research Assistant* July 2017 - August 2020
  - Analyzing the genetic and epigenetic effects in autism, post-partum depression, and non-communicable developmental disorders in underserved and underrepresented populations
  - Collaboration with Prof. Hudson Santos and Prof. Rebecca Fry
- **NC TraCS Institute** Chapel Hill, NC  
*Research Assistant* August 2017 - July 2018
  - Reviewed incoming grants for biostatistical support and provided statistical consultation for approved projects
- **Roche Innovation Center** New York, NY  
*Graduate Research Intern* May 2016 - August 2016
  - Identified immunogenetic signatures from omic profiles from clinical trials to estimate immune infiltration in breast cancer tumors in response to cancer drugs
  - Internship in the Data Science group of Translational Genomics at Roche, under the supervision of Dr. Francesca Milletti and Dr. Jurriaan Brouwer-Visser

• **CBKEN @ UNC**  
**Research Assistant**

Chapel Hill, NC  
 October 2015 - December 2016

- Modeled knowledge exchange networks in community-based health centers to assess best methods in knowledge dissemination and health practices in underinsured and low-income areas
- Presented findings to the North Carolina Department of Health and Human Services, October 2016
- With Prof. Timothy Carney

## Awards, Grants & Honors

O'Malley Alumni Award for Publication Excellence in Population Sciences (\$3,000)	2021
UCLA Bruins in Genomics Outstanding Mentorship Award	2021
International Society of Psychiatric Genetics Early Career Investigator Program Award	2021-present
Fellow, UCLA Institute of Quantitative and Computational Biosciences	2021-present
SER Conference Scholarship	2021
Center of Environmental Health and Susceptibility Training Grant	2019-2020
Susan G. Komen Graduate Training Fellowship in Breast Cancer Disparities	2018-2019
UNC-CH Department of Biostatistics Tuition Award	2017-2018
Mackenzie Family Foundation Innovation Scholarship	2011-2015
NSF Research Experience for Undergraduates, UGA	2014
UNC-CH OUR Summer Undergraduate Research Fellowship (\$5,000)	2013

## Publications

### Accepted manuscripts

12. **A. Bhattacharya**, A. Freedman, V. Avula, R. Harris, W. Liu, Y. Li, R. Joseph, L. Smeester, H. Hartwell, K. Kuban, T. O'Shea, C. Marsit, R. Fry, and H. Santos. *Genetic control of fetal placental genomics contributes to development of health and disease*. Forthcoming, *Nature Communications*, 2021. <https://www.medrxiv.org/content/10.1101/2021.04.12.21255170v1>.
11. A. Patel, M. García-Closas, A. Olshan, C. Perou, M. Troester, M. Love, **A. Bhattacharya**. *Gene-level germline contributions to clinical risk of recurrence scores in Black and White breast cancer patients*. Forthcoming, *Cancer Research*, 2021. <https://cancerres.aacrjournals.org/content/early/2021/10/27/0008-5472.CAN-21-1207?sf154130555=1>.
10. K. Hou, **A. Bhattacharya**, R. Mester, K.S. Burch, B. Pasaniuc. *Powerful GWAS in admixed populations when allelic effects are similar across ancestries*. Forthcoming, *Nature Genetics*, 2021.
9. G. Jones, K. Hoadley, L. Olsson, A. Hamilton, **A. Bhattacharya**, E. Kirk, H. Tipaldos, J. Fleming, M. Love, H. Nichols, A. Olshan, M. Troester. *Hepatocyte Growth Factor pathway expression in breast cancer by race and subtype*. *Breast Cancer Research*, 2021. <https://breast-cancer-research.biomedcentral.com/articles/10.1186/s13058-021-01460-5>.
8. **A. Bhattacharya\***, Y. Li, M. Love. *MOSTWAS: Multi-Omic Strategies for Transcriptome-Wide Association Studies*. *PLOS Genetics*, 2021. <https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1009398>
7. **A. Bhattacharya\***, Alina M. Hamilton, Melissa A. Troester, and Michael I. Love. *DeCompress: tissue compartment deconvolution of targeted mRNA expression panels using compressed sensing*. *Nucleic Acids Research*, 2021. <https://academic.oup.com/nar/advance-article/doi/10.1093/nar/gkab031/6125666?>

6. H. Santos, H. Adynski, R. Harris, **A. Bhattacharya**, A. Incollingo-Rodriguez, R. Cali, A. Torres Yabar, B. Nephew, C. Murgatroyd. *Biopsychosocial Correlates of Psychological Distress in Latina Mothers*. *Journal of Affective Disorders*, 2020. <https://www.sciencedirect.com/science/article/abs/pii/S0165032720332833>.
5. H. Santos\*, **A. Bhattacharya\***, R. Joseph, L. Smeester, K. Kuban, C. Marsit, T. O'Shea, and R. Fry. *Evidence for the Placenta-Brain Axis: Multi-Omic Kernel Aggregation Predicts Intellectual and Social Impairment in Children Born Extremely Preterm*. *Molecular Autism*, 2020. <https://molecularautism.biomedcentral.com/articles/10.1186/s13229-020-00402-w>. Co-first author.
4. **A. Bhattacharya\***, A. Hamilton\*, M. Troester, K. Hoadley, M. Love. *An approach for normalization and quality control for NanoString RNA expression data*. *Briefings in Bioinformatics*, 2020. <https://academic.oup.com/bib/advance-article-abstract/doi/10.1093/bib/bbaa163/5891144>. Co-first author.
3. **A. Bhattacharya**, M. García-Closas, A. Olshan, C. Perou, M. Troester, M. Love. *A framework for transcriptome-wide association studies in breast cancer*. *Genome Biology*, 2020. <https://genomebiology.biomedcentral.com/articles/10.1186/s13059-020-1942-6>. Winner of 2021 O'Malley Alumni Award for Publication Excellence in Population Sciences.
2. H. Santos, **A. Bhattacharya**, E. Martin, K. Addo, M. Psioda, L. Smeester, R. Joseph, S. Hooper, J. Frazier, K. Kuban, T. O'Shea, R. Fry for the ELGAN Investigators. *Epigenome-Wide DNA Methylation in Placentas from Preterm Infants: Association with Maternal Socioeconomic Status*. *Epigenetics*, 2019. <https://www.ncbi.nlm.nih.gov/pubmed/31062658>.
1. H. Santos, B. Nephew, **A. Bhattacharya**, E. Martin, R. Fry, K. Perrera, L. Smith, C. Murgatroyd, R. Alyamani, X. Tan. *Discrimination Exposure and DNA Methylation of Stress-Related Genes in Latina Mothers*. *Psychoneuroendocrinology*, 2018. <https://www.ncbi.nlm.nih.gov/pubmed/30144780>.

#### Pre-prints and submitted papers

11. **A. Bhattacharya\***, J. Hirbo\*, D. Zhou, W. Zhou, J. Zheng, M. Kanai, the Global Biobank Meta-analysis Initiative, B. Pasaniuc, E. Gamazon, N. Cox. *Best practices of multi-ancestry, meta-analytic transcriptome-wide association studies: lessons from the Global Biobank Meta-analysis Initiative*. Co-first author. Preprint, *medRxiv*. <https://www.medrxiv.org/content/10.1101/2021.11.24.21266825v3>.
10. W. Zhou, . . . , **A. Bhattacharya**, . . . , C. Willer, M. Daly, B. Neale for the Global Biobank Meta-analysis Initiative. *Global Biobank Meta-analysis Initiative: powering genetic discovery across human diseases*. Preprint, *medRxiv*. Lead TWAS analyst for GBMI. <https://www.medrxiv.org/content/10.1101/2021.11.19.21266436v1>.
9. N. Cole, P. Lee, T. Schwarz, P. Zhang, M. Gandal, B. Pasaniuc, **A. Bhattacharya**. *Breast and prostate distal-eQTLs mediated by non-coding RNAs overlap with genetic signals for overall and subtype-specific cancer risk*. Draft ready for submission.
8. R. Johnson, Y. Ding, **A. Bhattacharya**, A. Chiu, C. Lajonchere, D. Geschwind, B. Pasaniuc. *The UCLA ATLAS Community Health Initiative resource with EHR-linked phenotyping and genomic data*. Draft ready for submission.
7. H. Zhao, H. Rasheed, T. Nost, Y. Cho, Y. Liu, L. Bhatta, **A. Bhattacharya**, Global Biobank Meta-analysis Initiative, G. Hemani, G. Davey Smith, B. Brumpton\*, W. Zhou\*, B. Neale\*, T. Gaunt\*, J. Zheng\*. *Proteome-wide Mendelian randomization in global biobank meta-analysis reveals trans-ancestry drug targets for common diseases*. Draft ready for submission.

6. V. Lo Faro\*, J. Hirvo\*, **A. Bhattacharya**, N. Jansonius, H. Snieder, N. Cox for the Global Biobank Meta-Initiative. *A genome-wide association meta-analysis identifies new primary open-angle glaucoma loci. Draft ready for submission.*
5. R. Johnson, Y. Ding, V. Venkateswaran, **A. Bhattacharya**, 15 co-authors of UCLA Precision Health Data Discovery Repository Working Group and UCLA Precision Health ATLAS Working Group, C. Lajonchere, D. Geschwind, B. Pasaniuc. *Leveraging genomic diversity for discovery in an EHR-linked biobank: the UCLA ATLAS Community Health Initiative.* Preprint, *medRxiv*.  
<https://www.medrxiv.org/content/10.1101/2021.09.22.21263987v1.full.pdf>
4. W. Liu, L. Huang, Q. Sun, **A. Bhattacharya**, X. Tan, K. Kuban, R. Joseph, T. O'Shea, R. Fry, Y. Li, H. Santos. *Innovative computational approaches shed light on genetic mechanisms underlying cognitive impairment among children born extremely preterm.* Submitted, *Journal of Neurodevelopmental Disorders*.
3. G. Jones, K.A. Hoadley, H. Benefield, L. Olsson, A. Hamilton, **A. Bhattacharya**, E. Kirk, H. Tipaldos, J. Fleming, K. Williams, M. Love, H. Nichols, A. Olshan, M. Troester. *Racial differences in breast cancer outcomes by hepatocyte growth factor pathway expression.* In review at *Breast Cancer Research*, 2021.
2. H. Santos, J. Bangma, **A. Bhattacharya**, V. Zhabotynsky, K. Roell, C. Marsit, J. Rager, L. Smeester, T.M. O'Shea, B. Zou, F. Zou, R. Fry for the ELGAN Investigators. *Sexual Dimorphism in Placental DNA Methylation Predicts Positive Child Health Outcome at Age 10 Years.* In revision, *Epigenetics*, 2021.
1. H. Santos, **A. Bhattacharya**, B. Nephew, C. Murgatroyd, X. Tan. *Oxytocin function and emotional regulation in Latina mothers.* Submitted, 2021.

## Works in preparation

3. **A. Bhattacharya**, B. Neale, S. Lindström, P. Kraft, B. Pasaniuc. *Pan-cancer multi-tissue distal-eQTL-enriched transcriptome-wide association study reveals common pathways for risk of 17 cancers.* In preparation.
2. **A. Bhattacharya\***, M. Kim\*, C. Wen, B. Pasaniuc, M. Gandal. *Isoform-level transcriptome-wide associations of the fetal brain with neurodevelopment.* In preparation.
1. Y. Ding, **A. Bhattacharya\***, K. Hou, B. Pasaniuc. *A powerful and flexible procedure to fine-map causal genetic variants in admixed populations.* In preparation.

## Presentations

- **A. Bhattacharya**, A. Freedman, V. Avula, R. Harris, W. Liu, Y. Li, R. Joseph, L. Smeester, H. Hartwell, K. Kuban, T. O'Shea, C. Marsit, R. Fry, and H. Santos. *Distal mediator-enriched, placental transcriptome-wide analyses of 40 traits suggest genetic mechanisms supporting the Developmental Origins of Health and Disease hypothesis.*
  - *Society for Epidemiologic Research, June 2021.* Selected for oral presentation in So Much More Than GWAS: How Genetics Can Strengthen Causal Inference session.
  - *UCLA QCBio Research Seminar Series, April 2021.* Invited talk.
  - *Singapore Institute for Clinical Sciences Lecture Series, August 2021.* Invited talk.
  - *World Congress of Psychiatric Genetics, October 2021.* Selected for oral presentation in Genome-wide Approach session.
  - *American Society for Human Genetics Annual Meeting, October 2021.* Platform talk in Mechanisms of Fetal CNS Development session.

- *US Developmental Origins of Health and Disease Society Annual Meeting, November 2021*. Junior investigator keynote in the Gene, Epigenetics, and Fetal Programming session.
- **A. Bhattacharya**, A.M. Hamilton, M.A. Troester, M.I. Love. *DeCompress: tissue compartment deconvolution for targeted RNA panels using compressed sensing*.
  - *International Conference on Computational Advances in Bio- and medical Sciences, December 2020*. Invited talk at Computational Advances for Next Generation Sequencing Workshop.
- **A. Bhattacharya**, M.I. Love. *Multi-Omic strategies for transcriptome-wide association studies and applications to the DOHaD hypothesis*.
  - *American Society for Human Genetics Annual Meeting, October 2020*. Selected for platform talk in Rare Variants and Complex Disease session.
- **A. Bhattacharya**, M.I. Love. *MOSTWAS: Multi-Omic Strategies for Transcriptome-Wide Association Studies*.
  - *Society for Epidemiologic Research, December 2020*. Selected for oral presentation in Genetics in Epidemiology session.
  - *International Conference on Intelligent Systems for Molecular Biology, July 2020*. Selected for virtual oral presentation (VarI-COSI).
  - *International Genetic Epidemiology Society Meeting, July 2020*. Selected for virtual poster presentation (due to COVID).
  - *RNA 2020, May 2020*. Selected for virtual poster presentation (due to COVID).
- **A. Bhattacharya**, M. García-Closas, A. Olshan, C. Perou, M. Troester, M. Love. *A framework for transcriptome-wide association studies in breast cancer*.
  - *NCPF Workshop on Applying Big Data to Address the Social Determinants of Health in Oncology, October 2019*. Poster presentation at the National Academies of Science.
  - *American Society of Human Genetics Meeting, October 2019*. Poster presentation.
  - *International Genetic Epidemiology Society Meeting, October 2019*. Talk and highlighted poster presentation. One of 3 best poster awards.
  - *AACR Conference on The Science of Cancer Health Disparities in Racial/Ethnic Minorities and the Medically Underserved, September 2019*. Talk and poster presentation.
- **A. Bhattacharya**, H. Santos (presenting). *Placental Multi-Omics Prediction of Autism Spectrum Disorder at Age 10. Annual Meeting of the U.S. Developmental Origins of Health and Disease Society, September 2019*. Oral Presentation.
- **A. Bhattacharya**, M. Troester, M. Love. *Examining racial disparities in recurrence in the Carolina Breast Cancer Study: a transcriptome-wide association approach*. Plenary talk for Susan G. Komen. *American Association of Cancer Research, November 2018*

## Service

- Referee and Reviewer Experience
  - Referee for *npj Breast Cancer, Communications Biology, American Journal of Human Genetics, Genetics, Frontiers in Genetics, G3, Human Genomics*

- Abstract reviewer for the Society of Epidemiologic Research Annual Meetings
- Formal Mentorship
  - Mentor - Bruins-In-Genomics (B.I.G.) Summer Undergraduate Research Program 2021

## Teaching Experience

BIOS 735, *Introduction to Data Science* . . . . . Spring 2019  
 BIOS 550, *Basic Elements of Probability and Statistical Inference* . . . . . Spring 2018  
 BIOS 673, *Probability and Statistics* . . . . . Spring 2017

## Computing Skills

- **Advanced:** R (preferred), SAS,  $\text{\LaTeX}$
- **Intermediate:** Python, C++, Matlab