Zeal Jinwala

Center for Studies of Addiction
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Summary

- Biomedical Engineer with 5+ years of research experience spanning biomedical informatics and experimental biology across industry and academia
- Independent and collaborative researcher skilled at self-instruction, working with collaborators, teaching and training peers
- Excellent communicator as evidenced by 10 publications and several poster presentations

Education

B.S. Biomedical Engineering 2017 – 2022
Drexel University *Philadelphia, PA*
Areas of concentration: Biomedical Informatics

Skills

Coding Languages: Python, R, SQL, SAS, Bash
Software tools: Git, Nextflow
Methods: GWAS, PheWAS, MTAG, MR, fine-mapping, functional annotation, machine learning
Bioinformatics tools: PLINK, BCFtools, SAMtools, LDSC, IGV, GEO, METAL, UCSC Genome Browser, NCBI, PRScs, FUMA
Laboratory: Cell Culture, Gel electrophoresis, Microbial assays, DNA/RNA Isolation, PCR, fluorescence microscopy

Professional Experience

Data Scientist Sept 2022- Present
University of Pennsylvania, PIs: Drs. Henry Kranzler, and Emily Hartwell *Philadelphia, PA*

- **Goal:** Identify complex phenotypic and genomic interactions that lead to substance use and psychiatric disorders in Million Veteran Program data, Yale-Penn sample, and Penn Medicine Biobank
- Conducting statistical genetics and functional annotation analyses to detect pleiotropic loci as potential interventional targets for addiction and psychiatric treatment
- Generating study-specific individual-level datasets by querying EHR-linked database systems

Research Associate March, 2021- June 2022
A. J. Drexel Autism Institute, PI: Dr. Diana Schendel *Philadephia, PA*

- **Goal:** Comprehensive assessment of ASD risk associated with family history of 90 mental, neurologic, cardiometabolic, birth defects, asthma/allergy, and autoimmune disorders in the Danish birth registry
- Wrote and implemented scripts to generate visuals to summarize adjusted hazard ratios (aHRs) estimated via Cox regression models, providing valuable insights for modifiable risk factors studies
- Generated interactive Tableau dashboards for publication and presentation to non-scientific readers

Biomaterials Process Development Intern Sept, 2019- March, 2020
DSM Biomedical *Exton, PA*

- Piloted the development of VBA-supported material issuance forms to facilitate precise real-time calculations and allocations for enhanced operational efficiency of manufacturing processes
- Produced GMP-compliant Engineering Change Notices (ECNs), Failure Mode and Effects Analyses (FMEAs), and related documentation, crucially contributing to the seamless transition of biomaterial products from laboratory development to successful market upscaling

Microbiology Research Associate Sept 2018- March 2019
VenatoRx Pharmaceuticals *Malvern, PA*

- Conducted microbial experiments to assess Minimum Inhibitory Concentration (MIC) and Frequency of Resistance (FoR) for diverse drug candidates against 100+ multi-drug resistant bacterial strains
- Curated presentation materials from experimental data, contributing to pre-clinical documentation, highlighting essential insights for drug development strategies

Undergraduate Research Experience

Undergraduate Research Assistant March 2021- June 2022
Drexel Sequencing Lab, PI: Dr. Ming Xiao *Philadelphia, PA*

- **Goal:** Characterize telomere repair mechanisms in cancer cells from Single-Molecule Telomere Assay Optical Mapping (SMTA-OM) imaging data
- Developed an analysis pipeline for batch processing of imaging data for identification of specialized regions, mapping labels, and inter-label distances to support single-molecule level analysis
- Performed comprehensive statistical analysis on SMTA-OM experimental data, leading to the elucidation of telomere characteristics in cancer cells and culminating in a co-authored manuscript

Summer Research Fellow March 2018- August 2018
Drexel Vascular Kinetics Lab, PI: Dr. Alisa Morss Clyne *Philadelphia, PA*

- **Goal:** Investigate the effect of two metabolic inhibitors on angiogenesis in endothelial cell lines
- Performed human umbilical vein endothelial cell (HUVEC) tube formation assay with different angiogenesis inhibitor peptides and metabolic inhibitors
- Obtained and quantified phase contrast images of endothelial tube formations from the HUVEC assay using ImageJ software

Leadership and Teaching

Undergraduate Teaching Assistant April 2022- June 2022
Drexel College of Computing and Informatics *Philadelphia, PA*

- **Course:** CS 172- Computer Programming II
- Led weekly lab sessions to help students understand concepts related to object-oriented design, inheritance hierarchies, information hiding principles, string processing, recursion, documentation, and debugging/testing, fostering a solid foundation in software development concepts
- Graded exams and assignments; offering valuable feedback during dedicated office hours

Professional Development Chair 2021-2022
Alpha Omega Epsilon Society *Philadelphia, PA*

- Led events featuring faculty and professionals as speakers in seminars, offering valuable insights into professional development to over 50 students, including topics such as interview ettiquete, public speaking, and self-advocacy

Publications

1. Toikumo, S., Jennings, M.V., Pham, B.K. et al. *Multi-ancestry meta-analysis of tobacco use disorder identifies 461 potential risk genes and reveals associations with multiple health outcomes.* Nature Human Behavior (2024).
2. Toikumo, S., Vickers-Smith, R., **Jinwala Z.,** Xu, H., Saini, D., Hartwell, E.E., Venegas, M.P., Sullivan K.A., Xu, Ke., Jacobson, D.S., Gelernter, J., Rentsch, C.T., Million Veteran Program, Stahl, E., Cheatle, M., Zhou, H., Waxman, S.G., Justice, A.C., Kember, R.L., Kranzler, H.R (2023). *The genetic architecture of pain intensity in a sample of 598,339 U.S. veterans.* Nature Medicine
3. Davis, C., **Jinwala, Z.,** Hatoum, S.A., Toikumo, S., Agarwal, A., Rentsch, C.T., Edenberg, H.J., Baurley J. W, Hartwell, E., Crist, R.C., Gray, J., Justice, A. C., Gelernter, J., Kember, R., Kranzler, H. (2024). (*medrxiv*) *Candidate Genes from an FDA-Approved Algorithm Fail to Predict Opioid Use Disorder Risk in Over 450,000 Veterans*
4. Khan, Y., Davis, C., **Jinwala, Z.,** Feuer, K.L., Toikumo, S., Hartwell, E., Sanchez-Roige S., Peterson, R., Hatoum, S.A., Kranzler, H., Kember, R. (2024). (*medrxiv*) *Combining Transdiagnostic and Disorder-Level GWAS Enhances Precision of Psychiatric Genetic Risk Profiles in a Multi-Ancestry Sample.*
5. Davis, C., Khan, Y., Toikumo, S., **Jinwala, Z.,** Boomsa, D., Levey, D., Gelernter, J., Kember, R., Kranzler, H. (2024). (*medrxiv*) *A Multivariate Genome-Wide Association Study Reveals Neural Correlates and Common Biological Mechanisms of Psychopathology Spectra.*
6. Hartwell, E., **Jinwala, Z.,** Milone, J., Ramirez, S., Gelertner, J., Kranzler, H., Kember, H. (2024). (*medrxiv*) *Application of polygenic scores to a deeply phenotyped sample enriched for substance use disorders reveals extensive pleiotropy with psychiatric and medical traits.*

7. Schendel, D., Ejlskov, L., Overgaard, M., **Jinwala, Z.,** Kim, V., Parner, E., Kalkbrenner, A., Ladd-Acosta, C., Fallin, M., Xie, S., Mortensen, P., Lee, B. (2023). (*medrxiv*) *3-Generation Family Medical Histories of Mental, Neurologic, Cardiometabolic, Birth Defect, Asthma, Allergy, and Autoimmune Conditions Associated with Autism.*
8. Kranzler, H., Davis, C., Feinn, R., **Jinwala, Z.,** Oikonomou, A., Silva-Lopez, D., Burton, I., Dixon, M., Milone, J., Ramirez, S., Shifman, N., Levey, D., Gelernter, J., Hartwell, E., Kember, R.L. (2023). *(medrxiv) Adverse Childhood Events, Mood and Anxiety Disorders, and Substance Dependence: Gene X Environment Effects and Moderated Mediation.*
9. Xu, H., Toikumo, S., Crist, R. C., Glogowska, K., **Jinwala, Z.,** Deak, J. D., Justice, A. C., Gelernter, J., Johnson, E. C., Kranzler, H. R., Kember, R. L. (2023). *Identifying Genetic Loci and Phenomic Associations of Substance Use Traits: A Multi-trait Analysis of GWAS (MTAG) study.* Addiction.
10. Raseley, K., **Jinwala, Z.,** Dong, Z., Xiao, M (2023). *Single-Molecule Telomere Assay via Optical Mapping (SMTA-OM) Can Potentially Define the ALT Positivity of Cancer.* Genes.

Posters and presentations

1. Hartwell, E., **Jinwala, Z.,** Milone, J., Ramirez, S., Gelertner, J., Kranzler, H., Kember, H. (April 2024) Polygenic scores for psychiatric and medical traits provide insights into underlying pleiotropyin a deeply phenotyped sample enriched for substance use disorders. 2024 Penn Genetics Symposium, Philadelphia, PA.
2. **Jinwala, Z.,** Khan, Y., Kember, R., Gelernter, J., Kranzler, H., Hartwell, E. (June, 2024) Predicting treatment seeking for alcohol use using machine learning and polygenic scores. Research Society of Alcohol Annual Meeting, Minneapolis, MN.
3. **Jinwala, Z.,** Khan, Y., Kember, R., Gelernter, J., Kranzler, H., Hartwell, E. (September, 2023) Predicting Treatment-Seeking Status for Alcohol Use Disorder Using Machine Learning Integrated with Polygenic Risk Scores. Penn ASSET/IBI Symposium on Trustworthy AI for Health Care, Philadelphia, PA.
4. Hartwell, E.E., Kember, R.L., **Jinwala, Z.,** Gelernter, J., Kranzler, H.R. (June, 2023) Polygenic risk score for major depression predicts multiple alcohol-related phenotypes in a deeply phenotyped sample. Research Society on Alcohol meeting, Belview, WA.
5. Hartwell, E.E., Kember, R.L., **Jinwala, Z.,** Gelernter, J., Kranzler, H.R. (May, 2023) Performance of a polygenic risk score for major depression in a deeply phenotyped sample. NIDA Genetics and Epigenetics Meeting, Washington, DC.
6. **Jinwala, Z.,** Bishop, A., Shoshany, D., Salah, J., Saini, V., Izzetoglu, K., Diaz-Arrastia, R. (June, 2022) Personalized rebreathing device for Hypercapnia Administration. Drexel Biomed Senior Design Showcase, Philadelphia, PA.
7. **Jinwala, Z.,** Haruch, D., Swaminathan, S., Morss-Clyne, A. (January, 2019). Investigating the effect of two metabolic inhibitors on angiogenesis. Harvard University National Collegiate Research Conference, Cambridge, MA.
8. **Jinwala, Z.,** Haruch, D., Swaminathan, S., Morss, Clyne. (August, 2018). Investigating the effect of two metabolic inhibitors on angiogenesis. Biomedical Engineering Society Annual Meeting, Atlanta, GA.

Awards and Honors

Frequency Bio Fellow- Cohort 9, Pillar Venture Capital, 2023
Research Fellow, Drexel Undergraduate Research and Enrichment Programs, 2018-2022
Undergraduate Research Grant, Drexel Undergraduate Research and Enrichment Programs, 2021
Travel Award, Drexel Undergraduate Research and Enrichment Programs, 2018 and 2019
Founder's Scholarship, Drexel University, 2017-2022

Outreach

Consultant, Penn Biotech Group (PBG) Consulting, The Wharton School, 2023-present

- Conduct market research for pro-bono consulting projects for an early-stage Biotech company to gather intelligence on disease prevalence, global expansion, drug pricing, and market penetration strategies for their assets

Member, Penn Science Policy and Diplomacy Group (PSPDG), 2023-present

- Co-lead Science Policy workshops empowering doctoral students with knowledge of ways to engage in policy-making as scientists
- Wrote a letter to the editor of Philadelphia Inquirer about management of substance abuse in Philadelphia

Mentor, Rewriting The Code (RTC), 2023-present

Student Member, International Society for Computational Biology (ISCB), 2023-present

Peer Mentor, Society of Women Engineers, Drexel University, 2018-2022

Personal

Regional Player- Drexel Club Squash Team, 2018-2022