ZIRUI (TROY) ZHOU

Email: zz2901@cumc.columbia.edu

EDUCATION

Sept 2021 - May 2023	M.P.H.	**Columbia University, Mailman School of Public Health | New York, NY** • M.P.H. in Biostatistics / Certificate in Epidemiology of Chronic Diseases
Sept 2017 - May 2021	B.S.P.H.	**University of North Carolina at Chapel Hill | Chapel Hill, NC** • B.S.P.H. in Biostatistics & B.S. in Biology / Quantitative Track

SELECTED RESEARCH EXPERIENCE

June 2022 - present	Student Research Worker	**PHIA Project, ICAP at Columbia University | New York, NY** Supervisor: Chunhui Wang • Support the Population-based HIV Impact Assessment (PHIA) project and also the Bio-Behavioral Surveys (BBS) team in collaboration with the CDC and local governments in HIV/AIDS-affected countries. • Utilized R and SAS to generate required statistics using Bootstrap procedure from respondent-driven sampling (RDS) data. The data are used for final report and dataset release.
Apr 2022 - Present	Intern	**Center for Infection and Immunity, Columbia University Mailman School of Public Health | New York, NY** **High Density Peptide Arrays: Design, Algorithm, and Analysis** Advisor: Nischay Mishra, PhD • Trained and worked in the setting of immunology and serology. Learned how to use those tools to answer public health related questions like what the causal agent is for certain syndrome. • Focused on the identification of immunoreactive epitopes and analyzed their usage in diagnostic development for viral infection detection. • More specifically, worked on identifying potential causal agents of AES outbreak in Gorakhpur, India and candidate epitopes for specific DENV serotypes detection. • Current involved in project on Long COVID syndromes and Herpes viruses. • Paper writing in process for GKP project.
May 2021 - Aug 2021	R&D Intern	**HZYMES BIOTECHNOLOGY CO., LTD. | Suzhou, China** **Research & Development Intern, Research on Enzymes used in IVT** Advisor: Fuqiang Ma, PhD • Studied enzymes required to mass produce mRNA vaccines. • Specifically worked on Capping Enzymes (Vaccinia virus, Faustovirus), 2'-O-Methyltrannsferases (Vaccinia virus, Dengus virus), T7 RNA Polymerase, RNA Helicase, RNase H, and Restrictive Endonuclease. • Designed and examined mutants with improved performance (thermal stability, transcription efficiency, wider range of suitable substrates, or higher fidelity).
May 2019 - Apr 2020	Research Assistant	**UNC-Chapel Hill Lineberger Comprehensive Cancer Center | Chapel Hill, NC** **The Internet Tobacco Vendors Study** Advisor: Rebecca S. Williams, MHS, PhD • Made e-cigarette marketing trend prediction through data collection and data analysis. • Participated in the work of the Wave/Year 5 data analysis and Wave/Year 6's data collection. • Pricing and availability of merchandises were compared temporally. Specifically focused on age verification system and taxation methods.
Jan 2021 - May 2021	Individual Research Project	**Analysis of the Correlation between COVID-19 and Influenza Death Counts including State-level COVID Spending and Mask-Wearing Trend in the US** • Utilized SAS and online API databases to generate clean datasets containing relevant variables • Performed correlation analysis among the selected variable and discovered several statistically significant associations

- In particular, found significant correlation between mask rates and COVID-19 related deaths as well as between mask rates and influenza fatalities in many states.

Jan 2021 - May 2021	Course Project	**Newspaper Headlines and Civil Unrest: Sampling Design, Data Collection and Analysis, UNC**

- Utilized SUDAAN to analyze data collected from newspapers' headlines and tried to discover regional differences in violence occurrences.
- Data collected through randomly selected news outlets in the US. The results did not show statistically significant differences among the regions.
- Temporal trend of rising violent civil unrests was noticed nationwide but follow-up study was not conducted due to time constraint.

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Aug 2020 - Dec 2020	Course Project	**Expression Analysis of Lung, Stomach, and Kidney Cancers across Different Age Groups and Genders, UNC**

- Studied whether there was significant difference in gene expression of related genes among various age groups diagnosed with lung, stomach, and kidney cancers.
- Pathway analysis using DESeq2 and GSEA were conducted on these patients DNA sequences from TCGA.
- Significant variations in expressions were found for the three cancer types in relation to all age groups and genders.

Aug 2019 - Apr 2020	Course Project	**Opioid Education and Support (OES) Project, UNC**

- Examined the ongoing opioid epidemic in North Carolina and the vulnerability of adolescents towards drug abuse.
- Evaluated the severity by comparing state and national data from CDC, SAMHSA and NCDHHS in SAS.
- Developed an evidence-based educational intervention for five public schools in Graham, Cherokee, and Clay, NC, and presented the intervention proposal.

SKILLS

- **Programming:** SAS, R & R Markdown, SQL, SUDAAN, MATLAB, Java
- **Lab:** RNA-seq analyses, GSEA, NGS, batch fermentation, cell culture, electrophoresis, etc.
- **Language:** Spanish (Elementary), Japanese (Intermediate), English (Fluent), Chinese (Native)

AWARDS & HONORS

- Outstanding Internship, Hzymes Biotechnology (2021)
- Dean' List (2019 Fall, 2018 Spring, 2017 Fall)
- American Heritage School of Boca/Delray Statewide Invitational Statistics Team 5th Place (2017)
- Lifetime Science Achievement, Community School of Naples (2017)

OTHER EXPERIENCE

Sept 2022 - Dec 2022	Teaching Assistant	**Columbia University Mailman School of Public Health | Columbia, NY** **Course: Research Methods & Applications PUBH P6031**

Lecturer: Christine Mauro, PhD
- Grade student assessments and facilitate discussion or lab sections. Provide input and feedback on proposed studio assessments.
- Hold office hours and respond to student inquiries via email and follow-up in a timely manner.

PUBLICATION/writing sample?

- Zirui Zhou. "Feasibility of Adopting COVID-19 Quarantine Policy to Combat Global Warming" 2020 3rd International Conference on Humanities Education and Social Sciences, Chengdu, China, Oct 23-25, 2020. *Advances in Social Science, Education and Humanities Research* (ISSN 2352-5398)