

SHIYING LIU

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EDUCATION

Case Western Reserve University , Cleveland, OH <i>Doctor of Philosophy, Epidemiology & Biostatistics</i>	08/2019 – present
Carnegie Mellon University , Pittsburgh, PA <i>Master of Science, Biomedical Engineering</i>	08/2016 – 12/2017
Fudan University , Shanghai, China <i>Bachelor of Science, Biological Sciences</i>	09/2012 – 07/2016
The University of Hong Kong , Hong Kong, China <i>Exchange Study, Biological Sciences</i>	09/2014 – 12/2014

RESEARCH EXPERIENCE

Longitudinal changes in T-cell receptor sequence diversity in minimal change disease.

Research Assistant 12/2019 – present

Department of Population & Quantitative Health Sciences, Case Western Reserve University Advisor: Dana Crawford, PhD

- Characterized the T-cell receptor repertoire profiles for patients with minimal change disease both during active disease and complete remission, and working on identifying T-cell receptor beta-chain amino acid sequences unique to the active disease status along with common genetic variation associated with T-cell receptor diversity.

Analysis of Single-cell RNA Sequencing data of Fragile X Syndrome (FXS) Forebrain Organoids

Research Assistant 09/2019 – 12/2019

Department of Population & Quantitative Health Sciences, Case Western Reserve University Advisor: Harry Feng, PhD

- Analyzed the gene expression of the FXS forebrain organoids at the single-cell level, in which the differential expressed genes and the conservative marker genes were obtained for each cluster, and the single-cell pseudo-time trajectories were constructed to show the altered developmental trajectory in a cell type-specific manner.

Statistical Approaches in Analyzing Medical Data

Research Assistant 04/2018 – 04/2019

Department of Medicine, University of Pittsburgh Advisor: (Joyce) Chung-Chou H. Chang, PhD

- Identified the association between care fragmentation and mortality, while clustering hospitals to include group effects
- Explored surrogate marker in depth through literature research of causal inference and propensity score analysis
- Inspected the data analytic strategies involved in the analysis of electric health records using machine learning algorithms

Changes of Hippocampal Neuropeptide Y (NPY) Protein Expression after Controlled Cortical Impact (CCI)

Practicum Project 08/2017 – 07/2018

Center for Neuroscience research, Allegheny General Hospital Advisor: Kevin M. Kelly, MD, PhD

- Identified the associations among long-term alterations of NPY expression in three targeting subfields of hippocampi, CCI treatment, and posttraumatic epileptogenesis adjusting for injury severity

Role of Ca²⁺/Cation antiporters (CAX) gene family in *Arabidopsis thaliana*

Undergraduate Thesis Project 11/2015 – 07/2016

School of Life Sciences, Fudan University, China Advisor: Juan Lin, PhD

- Constructed overexpression vectors for *CAX1-11* to elucidate their function of salt/drought resistance and analyzed the gene expression after treated with a range of concentrations of cations with qPCR.

Identification of single-nucleotide polymorphisms (SNPs) in TBX6 associated with Infertility in Mice

Undergraduate Research Project 01/2015 – 10/2015

Genomic Disorders Group, Fudan University, China Advisor: Feng Zhang, PhD

- Identified SNPs from the experimental CRISPR mice cohort with spermatogenic impairment and verified the findings in the human study groups.

SOFTWARE SKILLS

- R, PLINK, SQL, MERLIN, Stata, Python, MATLAB, Java, etc.

PUBLICATION, PRESENTATIONS & HONORS

Sun, Z., **Liu, S.**, Kharlamov, E. A., Miller, E. R., & Kelly, K. M. (2018). Hippocampal neuropeptide Y protein expression following controlled cortical impact and posttraumatic epilepsy. *Epilepsy & Behavior*.

- Longitudinal changes in T-cell receptor sequence diversity in minimal change disease. American Society of Human Genetics (ASHG) 2020.
- Summer Institute in Statistical Genetics (SISG) scholarship at University of Washington (2020)