Yujie Zhang

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Education

- **University of California, San Diego** San Diego, CA
  Major in Bioengineering:bioinformatics, Minor in Mathematics(GPA 4.0), overall GPA 3.77 *Sep. 2017 – May. 2021*

Publications

- Kellman, B. P.; Zhang, Y.; Logomasini, E.; Meinhardt, E.; Godinez-Macias, K. P.; Chiang, A. W. T.; Sorrentino, J. T.; Liang, C.; ... & Lewis, N. E. Beilstein J. Org. Chem. 2020, 16, 26452662. doi:10.3762/bjoc.16.215 Co-first author.
- Martino, C., Kellman, B. P., Sandoval, D. R., Clausen, T. M., Marotz, C. A., Song, S. J., ... & Armingol, E. (2020). Bacterial modification of the host glycosaminoglycan heparan sulfate modulates SARS-CoV-2 infectivity. bioRxiv. Preprint

Experience

- **Systems Biology And Cell Engineering Lab (Lewis Lab)** La Jolla, CA
  Undergraduate Researcher *June 2019 - Present*
  - **Linear Code Reaction Rules (LiCoRR) paper**: Linear Code is the most concise and parsable nomenclature for big data analytics of glycans. However, the use of Linear Code by the current field has been inconsistent from each other and from its original setting. In this paper, we are summarizing some accommodations we have seen, together with the original Linear Code implementation rules, to recommend a more consistent version of Linear Code in representing glycosynthesis. We name it Linear Code Reaction Rules (LiCoRR). The paper is accepted.
  - **Machine Learning - predict glycan motifs**: This project is to predict glycan substructure presence at glycosylation sites given the protein surface. The goal is to apply the program to HIV and COVID-19 data. Through machine learning, we want to figure out the optimal sphere radius for predicting glycans and the best information source for predicting glycans. I'm writing the machine learning algorithms and testing it.
  - **Glyco Analysis WebApp development**: GlyCompare is a program written by PhDs in our lab. It is used to analyze glycans through decomposing them to a minimal set of intermediate substructures. I'm designing and impementing a web app as well as developping additional features for GlyCompare so that it will become a public functional web app soon. (Python + Flask + HTML)
  - **Glycan Database**: Design and implementation of a complex glycan (carbohydrate) database. The lack of interoperability slows the extraction of integrative insight. Our team designed a glycan database which includes all nomenclatures and associated datasets. Therefore, bridging the gaps left by inconsistently identified glycans across datasets and tremendously enriching the information content of the data. (Python + SQL + SPARQL)
- **NanoTools BioScience** La Jolla, CA
  Internship *March 2019 - Present*
  - **Image Analysis**: Designing and implementing a program based on imageJ using macro language to detect the cardiomyocytes (cardiac muscle cell) movement under specialized light sources in 2D videos. Spotified the cardiomyocytes based on the pixels' grayscale values. Then calculated the cardiomyocytes movements based on the pixels grayscale values change. Output the results as excel. (ImageJ + Python + groovy)
    GitHub: https://github.com/yuz682/Cell-Movement-Detector
- **Cartilage Tissue Engineering Lab** UCSD, CA
  Undergraduate Researcher *March 2018 - March 2019*
  - **Cartilage diffusion study**: To visualize the diffusion process in cartilage tissue, conducted microscopic diffusion experiment and designed the MATLAB coding on the analysis of microscopic grayscale image. Basically read in the grayscale values and highlight the area with specific grayscale value threshold and plot 2D graph to observe the trend

Professional Activities

- **Undergraduate Bioinformatics Club(UBIC)** UCSD, CA
  Academic Relations Chair *May 2018 - May 2019*
  - **Chalk Talk Series**: Communicate and invite professors to give speeches on their research fields. Hosted the Chalk Talk
  - **Town Hall Meeting**: Held UBIC annual Town Hall Meeting with faculties to discuss undergraduate bioinformatics curriculum

Award

- **Triton Research and Experiential Learning Scholars (TRELS)** UCSD, CA
  Glycan Database project *Sep. 2019*
- **Triton Research and Experiential Learning Scholars (TRELS)** UCSD, CA
  LiCoRR paper *Jan. 2020*

Skillset

- **Languages**: Python, SQL, SPARQL, MATLAB, macro, Java, R, C++, Linux, Latex, HTML, Flask
- **Software**: ImageJ, Bash
- **Lab Skills**: Electronic Microscope, Drill Press Machine, Pipetting, PBS+PI Making, MicroCT Experience