Bowen Yang (He/Him/His)

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EDUCATION

Georgetown University Washington, DC
M.S. in Bioinformatics Aug. 2021 - Dec. 2022(exp.)
Ludong University Yantai, China
B.S. in Biological Science, Outstanding students of Shandong Province (Top 1%) Aug. 2017 - Jun. 2021

RESEARCH INTERESTS

My research interests lie in using computational methods, particularly software development, data science, and machine learning to investigate biological function and biomarkers discovery.

RESEARCH EXPERIENCE

National Institute of Standards and Technology May 2022 - present
LIME, A High-Throughput Metabolite Annotation Tool, Supervisors: Dr. Tytus Mak, Dr. Evagelia Laiaki

- Cleaned and integrated various mainstream small molecule databases to create a centralized database of 286K+ unique compounds with uniform identifiers
- Developed a software LIME with a user-friendly GUI for high-throughput metabolite annotation and identification
- Served as the research assistant completing all coding independently

University of Washington Nov. 2022 - present
Deep Learning Model of Drug-Drug Interaction, Supervisor: Dr. Sheng Wang, Mentor: Yingheng Wang

- Tested and compared the performance of existing drug-drug interaction baseline models
- Co-develop a novel multimodal deep learning model using drug description, molecular structure, and drug features

Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences Jun. 2018 – Oct. 2020
C-type Lectins of Venerupis philippinarum[1,2], Supervisors: Dr. Dinglong Yang, Dr. Xiaoli Liu

- Completed culture of clams and bacteria, RNA extraction, cDNA synthesis, and gene cloning for 4 C-type lectins
- Conducted data curation and bioinformatics analysis, including nucleotide sequence analysis, protein domains prediction, and phylogenetic tree construction

Ludong University Aug. 2019 - Sep. 2020
New Production Process of Bone Glue[3], Supervisor: Dr. Xiaoli Liu

- Served as the team leader of an 8 undergraduate students team
- Designed a new type of crushing device that makes the bone-crushing particle size less than 5cm
- Designed a new production process that increases the transparency of bone glue by 8.2%

PUBLICATIONS

[1]. Xin, Z., Yu, D., **Yang, B.**, Chen, L., Hayouka, Z., Chen, X., Gong, Y., Dai, H., Wang, L., Zhao, Y., Liu, X., & Yang, D. (2020). Molecular characterization, expression and immune functions of two C-type lectin from Venerupis philippinarum. Fish & shellfish immunology, 107(Pt A), 260–268. https://doi.org/10.1016/j.fsi.2020.10.006 [paper]

[2]. Zhang, J., Zhang, Y., Chen, L., Yang, J., Wei, Q., **Yang, B.**, Liu, X., & Yang, D. (2019). Two c-type lectins from Venerupis philippinarum: Possible roles in immune recognition and opsonization. Fish & shellfish immunology, 94, 230–238. https://doi.org/10.1016/j.fsi.2019.09.009 [paper]

[3]. **Yang, B.** (2019). A Squeeze-Press Type of Crushing Equipment for Bone Glue Manufacturing. China National Intellectual Property Administration. ZL 2019 2 1899143.5 [patents]

SELECTED PROJECTS

Single-cell DNA and protein expression prediction model | TensorFlow, scikit-learn, Big Data Nov. 2022

- Built sparse matrices based on data from two independent sequencing technologies using singular value decomposition
- Designed a multimodal model using a layer-regularized dense neural network and multi-model embedding methods to predict how DNA, RNA, and protein measurements co-vary with development in single cells, deriving a correlation score of 0.809 on the test.

DNA-Protein-Disease Database | MySQL, Python, CouchDB, HTML/CSS, JavaScript, Linux May 2022

- Pre-processed and integrated multiple CSV files by using MySQL and construct three related sub-databases via JSON
- Designed a web application by using Ajax (HTML/CSS, JavaScript) that can be used to access database information deployed in CouchDB, the app support data retrieval, sorting, and contextual-based jumping

RNAseq Differential Expression Analysis | NGS, R, Galaxy Apr. 2022

- Preprocessed RNA-Seq data from brain and liver samples by using Galaxy, including trimming, mapping, etc.
- Conducted differentially expressed gene analysis and enrichment analysis using R and created data visualization
- Constructed biological interaction networks by using Cytoscape and identified the hub genes

MS/MS Viewer | Python, Matplotlib Dec. 2021

- Developed a mass spectrum visualization tool by using Python
- Parse MS/MS data files and user-entered peptides to label well-matched peaks, and automated data visualization

WORK AND SERVICE EXPERIENCES

Volunteer, Tengzhou Workers' Hospital Feb. 2020 – May 2020

- Assisted with taking temperatures, PCR tests, and sanitizing high-touch surfaces when most doctors and nurses were recruited to support Wuhan City during the pandemic

IT Intern, Sinopharm Group Oct. 2019 – Nov. 2019

- Cleaned and analyzed the group's sales in 3 cities to support the construction of a supply-processing-distribution information system
- Assisted with designing the application of the system in Linyi People's Hospital, including a web app to realize real-time information sharing between different healthcare providers and suppliers

Director of Public Affairs, Student Union, Ludong University Jun. 2018 – Jun. 2019

- Advertise academic and campus events through posters and display boards

SELECTED AWARDS

Outstanding students, Shandong Province (Top 1%) 2021
1st Prize (¥10,000), 7th Scientific and Innovation Challenge, Shandong Province 2020
Bronze Medal (¥2,000), 12th College Entrepreneurship Challenge, Shandong Province 2020
Merit Prize (¥2,000), 3rd Entrepreneurship Competition, Yantai City 2020
First-Class Scholarship (¥3,000), Ludong University 2020
Second-Class Scholarship (¥1,500), Ludong University 2019
1st Prize (¥10,000), 6th Scientific and Innovation Challenge, Shandong Province 2019

SKILLS

Programming: Python, R, HTML/CSS, JavaScript, SQL
Frames & Packages: PyTorch, Scikit-Learn, Pandas, NumPy, Matplotlib, Tkinter
Bioinformatics Tools: Galaxy, Cytoscape, bowtie, edgeR, DESeq2, clusterProfiler
Others: Linux/Unix, Git, AWS, NoSQL Database (CouchDB), RDKit, Latex
Wet lab experiments: Animal handling, Bacterial culture, qPCR, Gel electrophoresis