Qisheng Pan

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RESEARCH INTEREST

I studied human genetic variants, investigating the relationship between protein mutations and pathogenic phenotypes. Leveraging computational biophysical measurements and machine learning, my research focuses on providing a guideline of the interpretation of current methods, and the development of new approaches to better characterise the effect of variants.

EDUCATION

University of Queensland Brisbane, Australia

- Doctor of Philosophy (Computational Biology) *Jan 2022 - now*

University of Melbourne Melbourne, Australia

- Master of Science (Bioinformatic) *2019-2021*

South China Normal University Guangzhou, China

- Bachelor of Science (Biotechnology) *2015-2019*

PUBLICATIONS

1. **Pan Q**, Portelli S, Nguyen TB et al. Characterization on the oncogenic effect of the missense mutations of p53 via machine learning, Brief Bioinform 2023;25.
2. Serghini A, Portelli S, Troadec G et al. Characterizing and predicting ccRCC-causing missense mutations in Von Hippel-Lindau disease, Hum Mol Genet 2023.
3. Jessen-Howard D, **Pan Q**, Ascher DB. Identifying the Molecular Drivers of Pathogenic Aldehyde Dehydrogenase Missense Mutations in Cancer and Non-Cancer Diseases, Int J Mol Sci 2023;24.
4. Zhou Y, **Pan Q**, Pires DEV et al. DDMut: predicting effects of mutations on protein stability using deep learning, Nucleic Acids Res 2023;51:W122-W128.
5. Boer JC, **Pan Q**, Holien JK et al. A bias of Asparagine to Lysine mutations in SARS-CoV-2 outside the receptor binding domain affects protein flexibility, Front Immunol 2022;13:954435.
6. **Pan Q**, Nguyen TB, Ascher DB et al. Systematic evaluation of computational tools to predict the effects of mutations on protein stability in the absence of experimental structures, Brief Bioinform 2022;23.
7. Han YY, Jin K, **Pan QS** et al. Microglial activation in the dorsal striatum participates in anxiety-like behavior in Cyld knockout mice, Brain Behav Immun 2020;89:326-338.

TEACHING EXPERIENCES

Instructors, University of Queensland *Nov 2023*

- **Advanced Data Visualisation with *ggplot2***: This workshop is the one that I designed, prepared, and delivered, focusing on practical skills on presenting data using *R* and *ggplot2* package.

Teaching Assistant, University of Queensland *Sept 2022*

- **Computing4lifescience Series (*Sept 2022*)**

MENTORSHIP

Research Supervisor (UG: undergraduate, MS: master's)

Georgina Becerra Parra (UG, 2022, UQ), Dana Jessen-Howard (MS, 2023, UQ), Joshua Khoo (MS, 2024, UQ)

HONOURS & AWARDS

- Travel Awards of MM2023 conference *Dec 2023*
- SCMB Award for Outstanding Contribution to Research (Group Awards) *Nov2023*
- Student Prize in the CTCMS Seminar *Mar 2023*
- Comprehensive Student Scholarship *Sept 2016*

RESEARCH EXPERIENCES

Characterising the pathogenic effect of missense mutations via machine learning *2022 - now*

- Leveraged different computational biophysical measurements to annotate missense variants.
- Developed machine learning models to classify phenotypes of mutations.

Benchmarking computational biophysical measurements in the absence of experimental structures *2022 - now*

- Built high-throughput pipeline to generate protein homology models and AlphaFold models.
- Used different metric to assess the predictive performance of various machine learning models.

PRESENTATIONS

1. Poster presentation in the Lorne Protein Conference 2024 (Australia) *Feb 2024*
2. Oral and poster presentations in the MM2023 conference (Australia) *Dec 2023*
3. Poster presentation in the ABACBS 2023 conference (Australia) *Dec 2023*
4. Research Talk in the 22nd International Conference on Bioinformatics (Australia) *Nov 2023*
5. Lighting talk in the GenGen seminar (UQ) *Apr 2023*
6. Oral presentations in the CTCMS seminar (UQ) *Mar 2023*
7. Poster presentations in the Lorne Protein Conference 2023 (Australia) *Feb 2023*
8. Poster presentation in the 18th Annual Research Student Symposium (UQ) *Nov 2022*
9. Oral presentations in the Joint Biomolecular and Medicinal Chemistry Theme Symposium (UQ) *Apr 2022*

TECHNICAL SKILLS

Programming: Python, R, Linux Bash, JavaScript
Software: BLAST, MODELLER, PyMol, AutoDock Vina, GALAXY, etc.
Machine learning: Random Forest, Neural Network, Feature selection

REFEREES

David B. Ascher	Professor, University of Queensland	d.ascher@uq.edu.au
Thanh-Binh Nguyen	Research Fellow, University of Queensland	thanhbinh.nguyen@uq.edu.au
Stephanie Portelli	Research Fellow, University of Queensland	s.portelli@uq.edu.au
Douglas E.V. Pires	Senior lecturer, University of Melbourne	douglas.pires@unimelb.edu.au
Cheng Long	Professor, South China Normal University	longcheng@m.scnu.edu.cn