# Qisheng Pan

+61 401-937-290 | qisheng.pan@student.uq.edu.au | website

## RESEARCH INTEREST

I studied human genetic variants, investigating the relationship between protein mutations and pathogenic phenotypes. By 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) *Jun 2025 (expected)*

**University of Melbourne** Melbourne, Australia

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

**South China Normal University** Guangzhou, China

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

## PUBLICATIONS

1. **Pan Q**, Parra G, Myung Y et al. AlzDiscovery: A computational tool to identify Alzheimer's disease-causing missense mutations using protein structure information, Protein Sci 2024.

2. **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.

3. Serghini A, Portelli S, Troadec G et al. Characterizing and predicting ccRCC-causing missense mutations in Von Hippel-Lindau disease, Hum Mol Genet 2023.

4. 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.

5. 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.

6. 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.

7. **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.

8. 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

**Teaching Assistant,** University of Queensland *Aug 2024*

- **BIOT7060: Frontiers in Medical Biotechnology**

**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**

## 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

- Conference support of SAAFE 2024 AMR Solutions Summit *Sept 2024*
- 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*

## COLLABORATIONS

**Jeniffer Boer and Magdalena Plebanski, Royal Melbourne Institute of Technology, Australia** *2022 - 2023*

- Investigating the variants of the Spike protein in Omicron SARS-CoV-2 virus

## 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 SAAFE 2024 AMR Solutions Summit (Australia) *Sept 2024*
2. Poster presentation in the Lorne Protein Conference 2024 (Australia) *Feb 2024*
3. Oral and poster presentations in the MM2023 conference (Australia) *Dec 2023*
4. Poster presentation in the ABACBS 2023 conference (Australia) *Dec 2023*
5. Research Talk in the 22$^{nd}$ International Conference on Bioinformatics (Australia) *Nov 2023*
6. Lighting talk in the GenGen seminar (UQ) *Apr 2023*
7. Oral presentations in the CTCMS seminar (UQ) *Mar 2023*
8. Poster presentations in the Lorne Protein Conference 2023 (Australia) *Feb 2023*
9. Poster presentation in the 18$^{th}$ Annual Research Student Symposium (UQ) *Nov 2022*
10. 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, etc.

## 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 |