Wunna Kyaw

Email: wunna.a.kyaw@gmail.com

Citizenship: Australian. Eligible for Australian-specific E3 Visa – similar to Canadian TN status, no cost to employer, no fixed dates

Research Experience

Summer Research Associate *May 2024 – Present*
Troyanskaya Lab, Center for Computational Biology, Flatiron Institute, New York.
- Trajectory analysis in multiome data.
- Deep learning for variant effect prediction in single-cell trajectories.
- Supervisors: Prof. Olga Troyanskaya

PhD Candidate, Computational Biology *Jan 2021 - Present*
UNSW Australia
- Agent-based models to determine optimal macrophage search strategies, followed by *in vivo* imaging and calibration of models to imaging data – Published co-1st author in ***Cell.***
- Combining machine learning methods with 'omics datasets to determine spatial drivers of dormant cancer cell fate decisions – Published 1st author in ***Bioinformatics***.
- Supervisors: Prof. Tri Phan (UNSW Medicine), Prof. John Murray (UNSW Mathematics)

Research Assistant *Feb 2019 – Dec 2020*
Phan Lab, Immunology, Garvan Institute of Medical Research
- Investigating macrophage motility and dynamics during the adaptive immune response using 3D time-course imaging, image analysis, and computational modelling.

Vacation Research Student *Nov 2018 – Dec 2019*
Nguyen Lab (Computational Network Modelling), Monash University
- Constructed differential equation cellular network models in MATLAB to core network structures in drug resistant cancer signalling.

Honours Student *Feb – Nov 2018*
Lee Lab (Molecular Motors), EMBL Node for Single Molecule Science, UNSW
- Molecular dynamics simulation of protein self-assembly. Concluded with submission of a 70-page thesis and 20-minute department seminar – awarded student presentation prize

Vacation Research Student *Jan – Feb 2018*
Kuncic Lab (Biological Physics), Department of Physics, Sydney University
- Demonstrated the feasibility of a conceptual nanoscale particle sensor in collaboration with another undergraduate research student – mid-author publication in *The European Physical Journal C*

Vacation Research Student *Nov 2017 – Jan 2018*
Rasko Lab (Gene and Stem Cell Therapy), Centenary Institute, Sydney University
- Elucidating the consequences of oncogenic mutations in the *CTCF* gene using functional assays and protein structure modelling in human cancer cell models – mid-author publication in *Oncogene*.

Vacation Research Student *Nov 2016 – Jan 2017*
Tanaka Lab (Mathematical Biology), UNSW
- Analysed genomic data in R to visualize trends in 3867 unique SNPs across 32 genome analysis studies in *M. tuberculosis* – mid-author publication in *Applied and Environmental Microbiology*.

Primary Publications

2023:
* Indicates co-first Author.

Kyaw W, Chai R, Khoo WH, Goldstein L, Croucher PI, Murray J, Phan TG: ENTRAIN: integrating trajectory inference and gene regulatory networks with spatial data to co-localize the receptor-ligand interactions that specify cell fate. ***Bioinformatics*** 2023, 39.

Bhattacharyya ND*, **Kyaw W***, McDonald MM, Dhenni R, Grootveld AK, Xiao Y, Chai R, Khoo WH, Danserau LC, Sergio CM, et al: Minimally invasive longitudinal intravital imaging of cellular dynamics in intact long bone. ***Nature Protocols*** 2023.

Grootveld AK*, **Kyaw W***, Panova V, Lau AWY, Ashwin E, Seuzaret G, Dhenni R, Bhattacharyya ND, Khoo WH, Biro M, et al: Apoptotic cell fragments locally activate tingible body macrophages in the germinal center. ***Cell*** 2023, 186:1144-1161.e1118.

Other Publications

- Khoo WH, Jackson K, Phetsouphanh C, Zaunders JJ, Alquicira-Hernandez J, Yazar S, Ruiz-Diaz S, Singh M, Dhenni R, **Kyaw W**, et al: Tracking the clonal dynamics of SARS-CoV-2-specific T cells in children and adults with mild/asymptomatic COVID-19. Clin Immunol 2023, 246:109209.
- O'Hare CAJ, Matsos VG, Newton J, Smith K, Hochstetter J, Jaiswar R, **Kyaw W**, McNamara A, Kuncic Z, Grellscheid SN, Bœhm C: Particle detection and tracking with DNA. The European Physical Journal C 2022, 82:306. In media: https://www.newscientist.com/article/2316360-dna-based-detector-could-precisely-track-subatomic-particles/
- McDonald MM, Khoo WH, Ng PY, Xiao Y, Zamerli J, Thatcher P, **Kyaw W**, Pathmanandavel K, Grootveld AK, Moran I, et al: Osteoclasts recycle via osteomorphs during RANKL-stimulated bone resorption. Cell 2021, 184:1940.
- Bailey CG, Gupta S, Metierre C, Amarasekera PMS, O'Young P, **Kyaw W**, Laletin T, Francis H, Semaan C, Sharifi
- Tabar M, et al: Structure–function relationships explain CTCF zinc finger mutation phenotypes in cancer. Cellular and Molecular Life Sciences 2021, 78:7519-7536.
- Loo SL, Ong A, **Kyaw W**, Thibaut LM, Lan R, Tanaka MM, Kivisaar M: Nonsynonymous Polymorphism Counts in Bacterial Genomes: a Comparative Examination. Applied and Environmental Microbiology 2020, 87:e02002-02020.

Education

University of New South Wales
BSc (Honours, First Class) '18
Honours Thesis Grade: 89% (High Distinction)
University of Sydney
BSc '17, Biochemistry (Minor: Physics)
Weighted Average Mark: 85.7% (High Distinction). Equiv. GPA: 4.0.

Conferences - Speaker

Cell Symposia: Myeloid Cells – From Development to Function and Dysfunction *Jun 28-30, 2023*
Shanghai Jiao Tong University Medical School, Shanghai, China

- Presented a 15 min talk on intravital imaging and mathematical modelling to understand tingible body macrophage function

Australian Bioinformatics and Computational Biology Society Conference *Nov 28-2 Dec, 2022*
Monash University City Campus, Melbourne, Australia

- Presented a 15 min talk on machine learning to predict microenvironmental drivers of cell differentiation (ENTRAIN).

Conferences - Poster

Sydney Bioinformatics Research Symposium – University of Sydney *24 Jun 2022*

- Presented poster on ENTRAIN: microenvironmental drivers of cell differentiation

Asian Biophysics Association and Australian Society for Biophysics Symposium – RMIT Melbourne Australia *Dec 2 – 6, 2018*

- Presented honours research on molecular dynamics simulations of protein self-assembly.
- Awarded Student Presentation Award for Best Poster.

Awards

Publication of the Quarter Award – UNSW Medicine & Health, May 2023

- For first or co-first author in a high impact journal article (Cell, 2023)

Conference Awards

- Student Presentation Award – Asian Biophysics Association and Australian Society for Biophysics Annual Conference, Melbourne, Dec 2018.

Funding Awards

- 2024 Stuart Furler Family Travel Award: $5000
- 2023 UNSW Development and Research Training Grant: $1500
- 2022 UNSW Development and Research Training Grant: $1000

International Genetically Engineered Machine (iGEM) *Mar – Nov 2016*
2016 – Undergraduate Runner Up

- Design and ODE modeling for a cellular ethylene biosensor for the agricultural industry.
- Presented the project at the annual Jamboree in Boston, where our team was awarded 2nd out of 158 teams.