

Diego Taquiri-Díaz

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Education

- 2020–2024 **B.Sc in Biology**, *Universidad Peruana Cayetano Heredia* (#1 program in Peru)
GPA: 4.0/4.0, 16.8/20.0 in original scale (Top 20% of the class).
- 2017–2019 **B.S.E in Biomedical Engineering**, *Universidad Peruana Cayetano Heredia (UPCH) y Pontificia Universidad Católica del Perú (PUCP)*, Lima, Peru
GPA: 4.0/4.0, 15.5/20.0 in original scale (Top 10% of the class). Transitioned to a B.S. in Biology after 3 years of coursework.

Research Experience

- 2023–Present **Research Assistant**, *Grandjean Research Group*, University College London, UK
Principal investigator: MD, Ph.D. Louis Grandjean
Analysis of metagenomic wastewater sequencing, isolates from hospital-acquired infections, and optimization of metagenomics runs. My work included taxonomical classification, assembly of metagenomic MAGs, identification of pathogens and antimicrobial resistance genes, binning, quality assessment of genomes, phylogenomic analysis, plasmid analysis and methylation analysis, along with data preprocessing and visualization in R for publication-quality figures.
- 2023–Present **Research Assistant**, *Bioinformatics and Molecular Biology Lab*, Universidad Peruana Cayetano Heredia, Peru
Principal investigator: Ph.D. Mirko Zimic and Ph.D. Patricia Sheen
Genomic analysis of tuberculosis (TB) utilizing Nanopore and Illumina sequencing technologies, focusing on whole genome sequencing, amplicon sequencing, metagenomic analysis of sputum TB samples, and the study of TB heteroresistance and gene expression in TB blood samples. My contributions included the development of Nextflow bioinformatics pipelines for data processing, variant calling, assembly, expression analysis, among other tasks.

Publications

Under review

K. Vallejos-Sánchez, **D.A. Taquiri-Díaz**, O. Romero, A.P. Vargas, J. Coronel, A. Torres, J.L. Perez, A. Ochoa, R.H. Gilman, L. Grandjean, M. Cohen-Gonsaud, M. Zimic, P. Sheen. "Identifying heteroresistant tuberculosis infection from whole genome analysis of peruvian isolates". **Contribution: I designed and performed computational analyses.**

To be submitted in 2024

C. León, A. Osmaston, **D.A. Taquiri-Díaz**, O. Romero, J. Perez, B. Sobkowiak, J. Hatcher, A. Torres, R. Gilman, S. Huaman, J. Coronel, M. Zimic, P. Sheen, L. Grandjean. "A comparison of methods for *Mycobacterium tuberculosis* DNA extraction optimised for long-read Nanopore sequencing." **Contribution: I designed and performed computational analyses.**

G. Lawson, G. Tan, C. Leon Palomino, A. Osmaston, O. Romero, **D.A. Taquiri-Díaz**, L. Mascaro Rivera, L. Merino Castaneda, I. Baltas, A. Torres Ortiz, B. Sobkowiak, A. Mendoza Ticona, R. Gavilan, L. Alvarado Ruis, D. Gómez de la Torre, R.H. Gilman, J. Hatcher, P. Sheen Cortavarria, M. Zimic Peralta, M. Pajuelo Travezaño, L. Grandjean. "Identifying Novel Mechanisms of Carbapenem Resistant Enterobacterales in Lima, Peru". **Contribution: I designed and performed computational analyses, and contributed to manuscript writing.**

B. Balta, A. Zimic-Sheen, **D.A. Taquiri-Díaz**, O. Romero, J. Orellana, A. Chalco, M. Zimic. "Evaluation of the impact of the application of inorganic fertilizers in conjunction with biostimulants on the taxonomic and functional changes of the rhizosphere microbiome of avocado in an agro-exporting farm". **Contribution: I designed and performed computational analyses, and was involved in writing the paper.**

GitHub Repositories

- 2024 **AutismSketchClassifier**, *Pre-trained a ResNet neural network and used its feature vectors for KNN classification to detect autism-specific features in children's sketches.*
- 2024 **Biomedical Signal Processing**, *Processed ECG, EEG, and EMG signals, including denoising, feature extraction, data acquisition, and plotting.*
- 2024 **SimpleGenomicNextflow**, *Developed and maintained a suite of user-friendly and flexible Nextflow scripts for genomic and metagenomic analysis.*
- 2023 **ONT-tb-extraction**, *Developed R scripts for statistical analysis and plotting, along with a Nextflow pipeline for comparative analysis of Nanopore sequencing of TB.*

Skills

Programming, R, Python, Nextflow, Bash.

Toolbox, Linux, Git, ssh, LaTeX, VS Code, Tensorflow.

Languages, Spanish (native speaker), English (Full professional proficiency).

Leadership Experience

- 2022 **Directive Board Member**, *Journal Club*, Student Club, UPCH
Directed communications and club leader recruitment, successfully establishing 20 specialized journal clubs and guiding over 100 new participants.
- 2022 **Research Secretary**, *Student Center for Sciences CEC*, Student council, UPCH
Orchestrated the faculty-wide university Science Week, managing over \$3,000 in funding and achieving an engagement of 1,000+ attendees. Additionally, organized a series of science webinars and career guidance sessions, featuring insights from invited speakers.
- 2019 **Vice-President**, *IEEE Student Branch UPCH*, UPCH
Coordinated multiple university, inter-university, and national congresses, meetings and events, engaging over 100 participants per event.
- 2019 **Founding Leader**, *Biomedical Engineering Association*, Student council, PUCP
Led the foundational efforts to establish the Biomedical Engineering Association, managed a core group of 10 members in the structuring and drafting of the association's statutes.

Grant Writing

- 2023 **Research grant 82878, \$100,000, National Council for Science, Technology, and Technological Innovation (CONCYTEC), Peru**
Conceptualized and authored the bioinformatics section of the grant proposal: "Development and evaluation of a MinION (Nanopore) sequencing-based protocol for determining Heteroresistance in tuberculosis patients directly from sputum samples".

Courses

- 2024 **Natural language processing**, *Undergraduate Course (+60 hours)*, Universidad Peruana Cayetano Heredia, Peru.
- 2024 **Computer Vision**, *Undergraduate Course (+60 hours)*, Universidad Peruana Cayetano Heredia, Peru.
- 2024 **Population genomics**, *International Workshop (18 hours)*, Universidad San Martín de Porres, Peru, In collaboration with the Barreiro Lab, University of Chicago.
- 2023 **Bioinformatics and Artificial Intelligence**, *International Training (20 hours)*, Peruvian Society of Bioinformatics and Computational Biology (SPBBC).
- 2023 **Bioinformatics I**, *Undergraduate Course (+70 hours)*, Universidad Peruana Cayetano Heredia, Peru.
- 2023 **Introduction to Machine Learning**, *Undergraduate Course (+50 hours)*, Universidad Peruana Cayetano Heredia, Peru.
- 2022 **Neuromatch Academy: Deep Learning**, *International Summer School (+60 hours)*

Posters & Presentations

- 2024 **American Society of Tropical Medicine and Hygiene (ASTMH)**, *Poster Presentation: Identifying Novel Mechanisms of Carbapenem Resistant Enterobacterales in Lima, Peru*, New Orleans, LA, USA (Upcoming, 2024). D.A. Taquiri-Díaz, O. Romero.
- 2024 **V International Congress of the Peruvian Society of Bioinformatics and Computational Biology**, *Oral Presentation (online): Exploring the Computational Resources of the Bioinformatics and Molecular Biology Laboratory of UPCH and its Applications in Research*, Sociedad Peruana de Bioinformática y Biología Computacional, Lima, Peru. D.A. Taquiri-Díaz.
- 2019 **International Conference on Electronics, Electrical Engineering and Computing (XXVI INTERCON)**, *Tech Fair Stand: Customized Glove for De Quervain's Tenosynovitis Prevention*, Universidad Autónoma del Perú, Peru. D.A. Taquiri-Díaz, A. Tecse.

Honors & Awards

- 2019 **International Conference on Electronics, Electrical Engineering and Computing (XXVI INTERCON)**, *Best Applied Technological Development*, Universidad Autónoma del Perú, Peru
- 2019 **Institute of Electrical and Electronics Engineers (IEEE)**, *Best new student branch*, Universidad Peruana Cayetano Heredia, Peru.

Teaching Experience

- 2023 **Teaching Assistant**, *Course: Bioinformatics I: Sequence Analysis*, Master's Program, Universidad Peruana Cayetano Heredia, Peru
Led practical workshops (12 hours) for approximately 30 students, covering genomics assembly, molecular modeling with AlphaFold2/3 and molecular docking.
- 2022 **Academic Tutor**, *Course: Molecular Biology of the Cell*, Undergraduate's Program, Universidad Peruana Cayetano Heredia, Peru
Lectured sessions for the Peer Academic Mentoring Program (37 hours).

Extracurriculars

- 2024 **Journal Club Coordinator**, *Bioinformatics*, Sociedad Peruana de Bioinformática y Biología Computacional
- 2022 **Journal Club Participant**, *Structural Biology*, Sociedad Peruana de Bioinformática y Biología Computacional
- 2022 **Journal Club Coordinator**, *Artificial Intelligence*, Journal Club UPCH
- 2021 **Writer**, *University Journal*, The Novice Scientist UPCH
- 2020 **Journal Club Participant**, *Cell Biology*, Journal Club UPCH
- 2020 **Journal Club Participant**, *Cancer Biology*, Journal Club UPCH

References

Ph.D. Mirko Zimic, *Professor of Bioinformatics and Molecular Biology at UPCH*
Email: mirko.zimic@upch.pe

MD, Ph.D. Louis Grandjean, *Professor of Infectious Diseases at UCL, UK*.
Email: l.grandjean@ucl.ac.uk