Gabriel-Mateus Bernardo Harrington

Research Associate

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School of Medicine, Dementia Research Institue

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H-Mateus

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About me

Currently a Research Associate as a bioinformatician at the Dementia Research Institute, Cardiff University, working on Alzheimer's disease with a focus towards genomics.

Research profile

Currently a Research Associate Alzheimer's Disease group within the Dementia Research Institute at Cardiff University as a bioinformatician.

In my current role I proposed, built and maintain a PostgreSQL database of multiple large cohorts spanning over 20 years of data, which has enabled much more efficient and accurate access to this data, facilitating new and ongoing research projects. I have also built several extensible, well-documented pipelines for processing and analysis of data from multiple instruments and assays in a transparent, robust and reliable fashion. Most recently, I have proposed and lead on a push for more reproducible practises in research with colleagues, including the use of version control, project management strategies, containerisation and more. As part of this push I have also been promoting the use of registered reports to counter P-Hacking and HARKing.

My PhD at Keele University was based in the OsKOR group at The RJAH Orthopaedic Hospital and focused on spinal cord injury (SCI). SCI is damage to the spinal cord due to trauma, degeneration or disease that results in a temporary/permanent change to neurological function, recovery from which is highly variable, stymieing development of novel therapies as powering clinical trials is extremely difficult. SCI can lead to devastating consequences for both the physical and mental health of patients, particularly due to the uncertainty of neurological outcomes in the first two weeks post-injury. Recovery of neurological function following SCI can be highly variable, so my PhD focused on biomarkers for functional outcomes. This involved extensive data wrangling of electronic health records to generate prognostic models, and proteomic analysis of human plasma. From this work I have identified a relationship between markers of liver health and SCI recovery.

The lab rotations in the first year of my PhD also allowed me to greatly develop my skills at the bench. At Loughborough University, I investigated genetic expression in hydrogels, gaining experience in 3D tissue culture, hydrogels and PCR. At Nottingham University I studied the effects of alternating current on interfacing wires grown via wireless electrochemistry and gained experience in 3D printing, electrodeposition and microscopy. At Keele University I cultured multiple cell types in 3D and compared viability and growth kinetics via cell staining, fluorescent microscopy. These experiences have given me a highly cross-disciplinary skillset making me a flexible and versatile scientist.

Education

2018 - 2021 PhD in Biomedical Engineering — Keele University
Keele

2013 - 2016 Biological Sciences, 2:1 — Lancaster University
Lancaster

Awards

2022 Neurohack 2022 - Winning team — DEMON network
London

2021 Dementia research meets motorsports Innovation Accelerator - Winning team — Race Against Dementia
Cranfield University

Funding

2021 - 2021 CDT Consumable grant — EPSRC Centre for Doctoral Training in Regenerative Medicine
Loughborough

- £5000 awarded

Talks

2019 Reproducible Research — Centre for Doctoral Training Conference, 2019
Manchester

2021 Proteomic and bioinformatics analyses of plasma from SCI neurological improvers and non-improvers — ISCoS 2021
Oswestry

2021 Reproducible data analysis — Centre for Doctoral Training Conference, 2021
Virtual

Skills

R. Code
Python. Code
SQL. Code
Unix/Linux. Code
Bash. Code
Proteomics. Bioinformatics
Genomics. Bioinformatics
High performance cluster computing. Bioinformatics
Electronic Health data. Wet lab work
3D Tissue Culture. Wet lab work
Microscopy. Wet lab work
Animal handling. Wet lab work
Histology. Wet lab work
Portuguese. Language

Publications

1. Hulme, C. H., Peffers, M. J., Harrington, G. M. B., Wilson, E., Perry, J., Roberts, S., Gallacher, P., Jermin, P., & Wright, K. T. (2021). Identification of Candidate Synovial Fluid Biomarkers for the Prediction of Patient Outcome After Microfracture or Osteotomy. *The American Journal of Sports Medicine*, *49*(6), 1512–1523. https://doi.org/10.1177/0363546521995565
2. Brown, S. J., Harrington, G. M. B., Hulme, C. H., Morris, R., Bennett, A., Tsang, W.-H., Osman, A., Chowdhury, J., Kumar, N., & Wright, K. T. (2019). A preliminary cohort study assessing routine blood analyte levels and neurological outcome after spinal cord injury. *Journal of Neurotrauma*. https://doi.org/10.1089/neu.2019.6495
3. Bernardo Harrington, G. M., Cool, P., Hulme, C., Osman, A., Chowdhury, J., Kumar, N., Budithi, S., & Wright, K. (2020). Routinely measured haematological markers can help to predict AIS scores following spinal cord injury. *Journal of Neurotrauma*. https://doi.org/10.1089/neu.2020.7144
4. Bernardo Harrington, G. M., Cool, P., Hulme, C., Fisher-Stokes, J., Peffers, M., El Masri, W., Osman, A., Chowdhury, J. R., Kumar, N., Budithi, S., & Wright, K. (2022). *A comprehensive proteomic and bioinformatics analysis of human spinal cord injury plasma identifies proteins associated with the complement cascade and liver function as potential prognostic indicators of neurological outcome* [Preprint]. Bioinformatics. https://doi.org/10.1101/2022.07.12.499696