Ferran Cardoso Rodriguez

Curriculum Vitae

Selected Outputs

Publication **Cardoso Rodriguez & Qin et al., 2023**
A Single-cell Perturbation Landscape of Colonic Stem Cell Polarisation
DOI: BioRxiv (in review at Cell)

Package **FerranC96/pyKrack**
Computing Krackhardt hierarchy score on directed graphs
PyPI: pykrack

Pipeline **TAPE-Lab/CyGNAL**
CyTOF Signalling Analysis (CyGNAL) pipeline
DOI: Zenodo

Relevant Experience

Sept. 2019 – Present

UCL, PhD Thesis
Single-Cell Omic Analysis –*(Misc.)*

Using novel computational approaches to study **CRC organoids** and the **TME** through single-cell *omics*.

UCL-Yale Collab –(Python) Collaboration
Orchestrated an on-site **collaboration** between UCL and **Yale** aiming to characterise cellular **communications** using **graph-based** approaches. Blog entry

VRland –(Python) Method Development
Valley-Ridge score to generate data-driven **Waddington**-like **landscapes** of cellular **plasticity** and **differentiation** from **scRNA-seq** data. Project repository
Publication: Cardoso Rodriguez & Qin et al. 2023

CyGNAL –(Python/R) Analysis Pipeline
Pipeline for the **analysis** and interactive **visualisation** of **mass cytometry** data via PTM signalling and cell-state classification via ensemble MLS. Project repository
Publication: Sufi Qin et al. 2021

MSc Computational Projects

Imperial, MSc Project 3 Jun. – Sept. 2019
AnnoRE pipeline –(Python/R)
Pipeline for downstream annotation of **genetic variants** and metabolomics high-throughput data to study **complex trait** diseases. Project repository

Imperial, MSc Project 2 Apr. – Jun. 2019
scRNAseq data analysis –(R)
Analysis of **scRNA-seq** datasets to characterise **cardiac** development. Web report

Imperial, MSc Project 1 Jan. – Apr. 2019
FBA Flask app back-end –(Python)
Group project developing MetEOr, an **online tool** for visualising and performing **Flux Balance Analysis** on whole-organism **metabolic models**. Project repository

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Education

2019 – 2023(est) **PhD Computational Biology**
University College London
PhD programme at Dr. Chris Tape's lab (UCL Cancer Institute).

2022 **UCL-Yale PhD Exchange**
Collaborative exchange at Prof. Smita Krishnaswamy's lab (YSM/SEAS Yale University).

2018 – 2019 **MSc Bioinformatics and Theoretical Systems Biology**
Imperial College London
Multi-project programme.

2014 – 2018 **BSc Biotechnology**
Universitat de Barcelona
Erasmus at WHRI (QMUL).

Skills

Community **Collaboration** both within and outside research group.
Volunteering at public engagement events.
Teaching tutorials for BSc students and ESL teaching experience.
Public speaking at international events.
FAIR and **FOSS** advocate.

Technical **Languages**: Proficiency in Python and R. LaTeX, Markdown, web technologies.
Reporting: Publication-grade figures, interactive visualisations.
Workflows: Remote computing in HPC, nextflow pipelines, containerisation.

Data Analysis **Pipelines**: BCL to FASTQ, custom transcriptome references, sequence alignment.
scOmic data: Dim. reduction, clustering, dif. expression, compositional analysis, cell-cell communications, cellular dynamics, data integration.
ML applications: Knowledge-graph embedding, graph signal processing, classification models.

Development **Team Projects**: Version control and collaboration through git.
Build and deployment: Multi-language tools, interactive reports, PyPI and conda packaging, nbdev for notebook-centric development, container deployment.