

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: <i>BioRxiv (in review at Cell)</i>
PACKAGE	FerranC96/pyKrack COMPUTING KRACKHARDT HIERARCHY SCORE ON DIRECTED GRAPHS <i>PyPI: pykrack</i>
PIPELINE	TAPE-Lab/CyGNAL CYTOF SIGNALLING ANALYSIS (CYGNAL) PIPELINE DOI: <i>Zenodo</i>

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 MetEO, 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 <i>PhD programme at Dr. Chris Tape's lab (UCL Cancer Institute).</i>
2022	UCL-Yale PhD Exchange <i>Collaborative exchange at Prof. Smita Krishnaswamy's lab (YSM/SEAS Yale University).</i>
2018 – 2019	MSc Bioinformatics and Theoretical Systems Biology IMPERIAL COLLEGE LONDON <i>Multi-project programme.</i>
2014 – 2018	BSc Biotechnology UNIVERSITAT DE BARCELONA <i>Erasmus at WHRI (QMUL).</i>

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, PyTorch.
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.