Miu Shing (Matthew) Hung

Bioinformatician @ The Francis Crick Institute

+44 (0)7479 460 658 *matthewhungms@gmail.com* *http://github.com/hungms*

Research Experience

Bioinformatician — Immunity & Cancer

Supervisor: Dr Dinis Calado, The Francis Crick Institute — **Jun 2023 – Present**

Topics – B-cell lymphomagenesis, chemotherapy resistance, plasma cell longevity, vaccine efficacy

- *Performed NGS processing & analysis across 6 projects; analysed >20 T- & B-cell single-cell datasets*
- *Developed advanced R packages to pipeline single-cell and JH4 amplicon sequencing analysis*
- *Self-host CELLxGENE portal and GitHub Pages to enable user-friendly visualization of outputs for lab members*
- *Validate lymphomagenesis in novel mouse genetic models by the inference of copy number variation & trajectory analysis*
- *Establish novel prognostic gene signatures from mouse single-cell datasets for B-cell lymphoma patients*
- *Integrate epigenome, transcriptome and proteome data to identify targets for antibody staining & gene manipulation*
- *Characterization of antigen-specific plasma cells during infections & vaccination via scRNAseq & VDJ clonotype analysis*

Bioinformatician — Cancer Bioinformatics

Supervisor: Prof Anita Grigoriadis, King's College London — ***Oct 2022 – Mar 2023***

Project – Role of plasma cells in triple-negative breast cancer (TNBC) metastasis

- *Collaborated between UK Biobank, Francis Crick Institute & Lund University*
- *Retrieved and analysed clinical and pathological data of four TNBC study cohorts consisting of ~600 patients*
- *Derived mature B-cell subset signatures from human paired tumour & lymph node single-cell transcriptomic datasets*
- *Deconvoluted tumour-infiltrating immune cells in patient RNAseq data for multivariate survival analysis*
- *Performed tumour differential expression, pathway enrichment and copy number variation analyses*

MRes Student — Cancer Research, Immunology and Haematology

Supervisor: Dr Shahram Kordasti, King's College London — ***Apr 2022 – Sep 2022***

Project – Characterise T_{reg} subset under hypoxia and inflammation in aplastic anaemia (AA)

- *Performed GSEA and IPA analysis of AA single-cell data to pinpoint central transcription regulators in T_{reg}, myeloid cells and HPSCs*
- *Set up hypoxic cell culture of CD4+ CD25+ T_{reg} from PBMCs with Dr James Arnold*
- *Applied multi-panel flow cytometry to phenotype naïve and effector Treg subsets*

MRes Student — Cancer Bioinformatics

Supervisor: Dr Anita Grigoriadis, King's College London — ***Sep 2021 – Mar 2022***

Project – Regulations of T_{reg} and T_{fh} during lymph node metastasis of breast cancer

- *Analysed T_{reg} and T_{fh} from 250k tumour, stromal and immune cell 10X scRNA-seq data*
- *Deciphered ligand-receptor interactions between immune cells with LIANA, NicheNet and CellChat*
- *Data management and shell-scripting on HPC platforms across institutions (KCL, UCL, CoLCC)*

BSc Student — Vascular Therapeutics

Supervisor: Dr Beata Wojciak-Stothard, Imperial College London — ***Sep 2020 – Mar 2021***

Project – Role of KLF2 on endothelial dysfunction in pulmonary arterial hypertension

- *Manipulated gene expression with shRNA and microfluidic flow simulation on human pulmonary arterial endothelial cells (HPAECs)*
- *Performed immunofluorescence, confocal imaging and luciferase reporter assay to study cell morphology, alignment, and pro-inflammatory response*

Skills

Language	*R, Python, Bash, Perl, SQL, CSS*
Data Analysis	*RNAseq, ATACseq, Single-cell CITEseq & VDJseq (TCR/BCR), JH4 amplicon-seq, Mass-spectrometry, High-dimensional flow/mass-cytometry analysis, Survival analysis*
Development	*GitHub/Git, Quarto, Jupyter, VScode, Singularity, Nextflow*
Pipelines	*R: Seurat, Immcantation, DESeq2, Spectre, InferCNV, LIANA, NicheNet, scRepertoire, Slingshot* *Python: Scanpy, Dandelion, Tensor, Cell2Cell, PAGA, scVelo, CellRank*
Wet-Lab	*CRISPR-Cas9, Flow cytometry, Microfluidics, Mammalian cell culture, Western blot, RT-qPCR, Immunofluorescence, Luciferase reporter assay, Adenovirus transfections*

Publications

- *Li M, Quintana A, Alberts E,* ***Hung MS****, Boulat V, Ripoll MM, Grigoriadis A. B Cells in Breast Cancer Pathology.* ***Cancers (Basel). 2023 Feb 28****;15(5):1517. doi: 10.3390/cancers15051517*

Conferences

Dec 2024 *(Upcoming)*	**66th ASH Annual Meeting and Exposition – San Diego, California, US** *Oral presentation – "Characterizing and Targeting Follicular Lymphoma's Common Progenitor Cells" by Dr Dinis Calado*
Oct 2024	**8th UK & Germany Lymphoma Retreat – Peak District, UK** *Oral presentation – "Germinal Centre B Cell Autonomy Through Aberrant MYC Overexpression Drives Lymphomagenesis" by myself*
Jul 2024	**EMBO Workshop: Lymphoid Tissues and Germinal Centres in Immune Reactions – Galway, Ireland, UK** *Poster presentation – "Timestamping of plasma cells reveals diverse gene signatures determining longevity potential" by Dr Anqi Xu*
May 2024	**West German Lymphoma Symposium: Clinic meets Biology – Essen, Germany** *Poster presentation – "Unveiling Follicular Lymphoma's Common Progenitor Cells" by Dr Oscar Atkins; 3rd Place*
Dec 2023	**BSI Congress 2023 – Belfast, Northern Ireland, UK** *Oral & poster presentation – "MYC overexpression promotes germinal centre B cell independency from T cell help" by Dr Baizhi Chen*

Qualifications

MRes Translational Cancer Medicine — **Grade: Distinction**

King's College London, UK — ***Sep 2021 – Oct 2022***

Thesis 1	*Single-cell RNA sequencing revealed distinct molecular interactions involving Treg & Tfh between metastatic & cancer-free lymph nodes from breast cancer patients (72%)*
Thesis 2	*The role of IL-1β, IFN-γ and hypoxia in Treg modulation and its implications in the pathogenesis of aplastic anaemia (85%)*
Coursework	*The significance of translational research on immune checkpoint inhibitors for combination chemotherapy in triple negative breast cancer patients (71%)*

BSc Medical Biosciences — **Grade: First-Class**

Imperial College London, UK — ***Sep 2018 – Jul 2021***

Modules	*Cancer Biology (73%), Immunology & Inflammation (68%), Genetics & Genomics (64%), Molecular Cellular Biology (74%), Statistics (67%), Microbiome in Health & Diseases (76%)*
Thesis	*Silencing of KLF2 augments endothelial dysfunction associated with pulmonary arterial hypertension (73%)*

GCE A-Levels — **Grade: A*A*AAA**

Abingdon School, Oxfordshire, UK — ***Sep 2016 – Jul 2018***

Subjects	*Maths (A*), EPQ (A*), Further Maths (A), Biology (A), Chemistry (A)*

Achievements

GitHub Repositories

- https://github.com/cancerbioinformatics/BLESS
- https://github.com/hungms/scUnify
- https://github.com/hungms/scworkbook