EFFIE KLIMI

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SKILLS

Cell & Tissue culture: primary mammalian cells, HeLa, HEK293T, human & pig vein tissue, explant culture, *S. pombe*, bacteria

Wet lab: RT-qPCR, flow cytometry, transfection/nucleofection, virus production & transduction, cloning, immunohist./fluorescence, immunoblotting

Imaging: Trained on confocal microscopy and experience with Fiji- and python-based image analysis

Programming: R (tidyverse, Bioconductor + more), Python (Pandas, NumPy + more), Bash, NextFlow, Node.js, React, Typescript, PostgreSQL

Data visualisation: Seaborn in python, ggplot/shiny in R, D3.js in Javascript

Raw sequencing quality control and pre-processing: WGS/WGBS, ChIP-seq, ATAC-seq, bulk/small/single cell RNA-seq analysis

(Epi)genomics: Variant calling (SNPs/indels & structural variants), GWAS/eQTL analyses, ChIP- & ATAC-seq peak calling & downstream analysis

Transcriptomics: Differential expression analysis, single cell RNA-seq clustering/marker identification/integration, GSEA, HOMER-based TF analyses

Computational structural biology: Protein tertiary structure modelling (PyMOL), RNA secondary structure modelling (RNAfold)

EXPERIENCE

PhD Research – PI: Prof Andrew Baker | Queen's Medical Research Institute, University of Edinburgh (Oct 2019 - Apr 2024)

Project 1: Identification of therapeutic miRNAs regulating pathologically de-differentiated (proliferative) vascular smooth muscle cells

- Tested 2000+ miRNAs using a high-throughput phenotypic screen (collaboration with Prof Mauro Giacca, KCL)
- Evaluated the top candidates as potential therapeutics & explored their targets using RNA-seq
- Evaluated all human miRNAs based on processing efficiency by the miRNA machinery using sequence and structural determinants
- Designed and tested adenoviral vector systems for therapeutic delivery (collaboration with Batavia Biosciences B.V.)

Project 2: Studying endogenous miRNA loci dysregulated in de-differentiated vascular smooth muscle cells

- Developed transcriptomics & genomics pipelines with R, Python, Unix and NextFlow using datasets from multiple –omics modalities
- Analysis of time-series data & integration of multiple -omics datasets

Project 3: Dissection of a novel locus implicated in vascular smooth muscle cell biology, MEST/miR-335

- Manipulated the expression of each compartment of the locus
- Explored its role in vascular smooth muscle cell biology in health and disease

Also involved in:

- A project on pro-angiogenic extracellular vesicles derived from a stem cell-derived endothelial cell product
- Extracellular vesicle isolation and RNA-seq analysis of their contents
- Training new lab members (students and postdocs)

Virology training – PI: Wilfried Bakker | Batavia Biosciences B.V., Leiden, NL (July - Aug 2023)

- Generation of clinical-grade Adenovirus-based delivery vectors.

Honours Project (BSc Genetics) – PI: Dr Alessandro Bianchi | Genome Damage and Stability Centre, University of Sussex (Sept 2018 – Feb - 2019)

- Structure-function analysis of the DNA helicase factor Cdc45 in *S. pombe*
- *S. pombe* culture and Cre-lox-mediated insertion of Cdc45 mutants generated by error-prone PCR & tertiary protein structure modelling of temperature-sensitive Cdc45 mutants (PyMOL)

Junior R.A.– PI: Prof Adam Eyre-Walker | Evolution, Behaviour and Environment Department, University of Sussex (June – Sept 2018)

- Used single nucleotide polymorphism data (from the 1000 genomes project) and *de novo* mutation data (from multiple studies) to estimate the variation of the effective population size across the human genome

EDUCATION

PhD Cardiovascular Science | Queen's Medical Research Institute, University of Edinburgh (Oct 2019 - Apr 2024)

BSc Genetics (Result: First Class) | School of Life Sciences, University of Sussex (Sept 2016 - Jun 2019)

TALKS · PRESENTATIONS

Cardiovascular Research Institute Maastricht | Talk, virtual (2023)
"Functional screening identifies novel miRNAs inhibiting Vascular Smooth Muscle Cell proliferation"

Keystone Symposia "Small Regulatory RNAs: From Bench to Bedside" (won award from the NIH/NCI) | Poster presentation, Santa Fe, NM (2022)
"Investigating miRNAs regulating vascular smooth muscle cell proliferation"

Centre for Cardiovascular Science Symposium | Poster presentation, Edinburgh, UK (2022)
"miR-335/MEST: a novel potential regulator of vascular smooth muscle cell pathophysiology"

Centre for Cardiovascular Science Symposium | Poster presentation, Edinburgh, UK (2021)
"Development of a miRNA-based therapy aimed at blocking proliferation of vascular smooth muscle cells"

MANUSCRIPTS · PUBLICATIONS

"Functional screening identifies novel miRNAs inhibiting Vascular Smooth Muscle Cell proliferation" Joint 1st author, *Manuscript in review in Molecular Therapy* (2024) https://doi.org/10.1101/2024.04.04.587890

"Vascular smooth cell function and dysfunction controlled by non-coding RNA" Joint 1st author, *Accepted: British Journal of Pharmacology* (2024)

"Extracellular vesicles from a human embryonic stem cell-derived endothelial cell product induce angiogenesis with high efficiency at very low input and contain miRNAs with novel proangiogenic function" 5th author, *Molecular Therapy* (2024) https://doi.org/10.1016/j.ymthe.2023.11.023