

JACK GISBY

2 Manilla Road, Birmingham, B29 7PU

(+44)7748 559964 ◊ jackgisby@gmail.com ◊ <https://github.com/jackgisby>

RESEARCH INTERESTS

Highly motivated biochemistry student, with an interest in computational biology, seeking to develop my research and computational skills. The application of next generation sequencing (NGS) and other "omics" technologies to study complex biological systems is fascinating, and fraught with computational challenges.

Having discovered a fascination for programming during my degree, I began learning about computer science and bioinformatics before applying my skills to the development of an R package for the identification of Pack-TYPE transposable elements; these elements acquire chromosomal DNA after incomplete excisions of closely spaced repeats and are poorly predicted in annotation studies. "packFinder" facilitates the detection of these transposons, which have important implications in the evolution of host genes.

My dissertation currently involves development of the python package "Metaboverse" which attempts to expand the search space of small molecules for untargeted metabolomics experiments. Improved automated annotation of metabolites will improve the standard workflows for the growing field of metabolomics; improvements in high-throughput technologies will lead to the possibility of improved multi-omics integration.

After comparing these projects to my experience in industry, it is clear that I thrive in an academic environment at the frontier of human knowledge; therefore, I would like to pursue a PhD where I may conduct my own research and contribute to my fields of interest. As a biologist with a passion for computation and the "omics" technologies, I am particularly keen to develop my programming and technical skills. My skillset, previous research experience and tenacious nature will make me a committed and competent PhD candidate.

EDUCATION

University of Birmingham

September 2016 - Present

Biochemistry with Professional Placement (MSci)

Current Average: 74%

Key courses: Gene Expression Analysis, Genetics, Research and Funding, Experimental Design and Analysis. Significantly improved my statistical and programming skills while gaining a background in molecular biology, physiology and genetics. Dissertation project involved the development and validation of a freely-available computational workflow, "Metaboverse".

RESEARCH EXPERIENCE

A Prior Knowledge-Based Computational Workflow for *de novo* Structural Elucidation of Small Molecules in Mass Spectrometry Metabolomics

Dr Ralf Weber

October 2019 - Present

- Extended an existing codebase for the generation of *de novo* metabolites and refactored for PEP8 compliance. Developed my understanding of databases, data structures and algorithms for the optimisation of Metaboverse; used isomorphic graphs for the generation of molecules from substructures stored in SQLite databases.
- Processed mass spectrometry metabolomics datasets for the validation of Metaboverse. Produced a pipeline for the generation of large substructure databases using a linux high performance computing cluster.

An Automated Tool for *de novo* Annotation of Pack-TYPE Non-Autonomous Transposable Elements

Dr Marco Catoni

August 2019 - Present

- Designed and implemented an R package to automatically detect transposable elements. Used command line and bioconductor tools to process sequence data.
- Adhered to R standard practices for the organisation, testing and documentation of packages; learned to use version control for the management of programming projects.

Development of an Immunoturbidimetric Assay for Serum Amyloid A

The Binding Site

August 2018 - August 2019

- Routinely used excel, and statistical packages such as Analyse-It/Minitab, to analyse and present data to co-workers and managers.
- Took responsibility for planning and carrying out experiments and statistical analyses in a research environment. Received training in scientific writing in order to routinely produce experimental write-ups for submission to regulatory bodies; this involved compliance to standard operating procedures.
- Developed an assay for serum amyloid A for use in clinical laboratories; produced an extended literature review and project report before giving a presentation at the University of Birmingham based on my experiences.

SPECIFIC RESEARCH SKILLS

Operating Systems	Windows, Ubuntu
Programming Languages	Python, R, SQL
Related Tools	Bioconductor, ggplot2, SciPy, Matplotlib, sklearn, Samtools, Git, BLAST
General Software	MS Office, Latex

ADDITIONAL COURSES

The Biostar Handbook: Bioinformatics Data Analysis by Istvan Albert

Introduction to Computer Science and Programming Using Python by MITx

Introduction to Computational Thinking and Data Science by MITx

Data Analysis for Life Sciences and Genomics Data Analysis by HarvardX

Metabolomics: Understanding Metabolism in the 21st Century by University of Birmingham

Rosalind "Bioinformatics Stronghold" Problem Sets (Level 5 - Python)

ADDITIONAL SKILLS & INTERESTS

Regularly complete online courses and work on personal programming projects in my own time. Have applied my learning to teach others during after school "Code Clubs", developing my own teaching ability and providing help with coding skills to younger children.

Avid boulderer and beginner trad climber - climbing is excellent for fitness, very social and I enjoy supervising beginner climbers.

REFERENCES

Available upon request.