ALISON HEGGIE

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EDUCATION

Imperial College London, United Kingdom — Oct 2017 – Jun 2020

- **BSc Biochemistry** First Class Honours
- Awarded the Convenors' Prize in Synthetic Biology for having the highest module marks
- Awarded best bio-based business pitch during a final year module
- Achieved a 1st in Accounting option module in 2nd year
- Final Year Modules: Metabolic and Network Engineering, Mechanisms of Gene Expression, Synthetic Biology

United World College of Southeast Asia, Singapore — Aug 2013 - May 2017

- **International Baccalaureate** (42/45 points) | HL: Chemistry, Biology, Business Management
- **International General Certificate of Secondary Education (IGCSE):** 7A* including Science, English and Maths and 2A

PUBLICATIONS

2021

- Collaborated on a minireview focused on the *Salmonella* effector SteC and how it modulates the F-actin meshwork surrounding the SCV. This first-author review has been accepted into Cellular Microbiology pending minor edits.

WORK EXPERIENCE

Imperial College London, London — Oct 2020 – Present

Research Assistant under Professor David Holden

- Undertaking a research project on a COVID-19 vaccine*:* using *Salmonella* to express and secrete SARS-CoV-2 viral protein
- Project focused on using a bacterial Type V Secretion System (autotransporter) to express and secrete viral proteins
- Currently working on another literature review on SARS-CoV-2 linear epitopes that elicit a neutralising antibody response
- Presenting and participating in discussion during weekly lab meetings developing critical analysis skills and clearly communicating my results, progress and challenges

Skills/Techniques:

- Gene cloning to make autotransporter constructs with different passenger domains (control and parts of SARS-CoV-2)
- Transformation of constructs into *Salmonella* strains: heat shock transformation and electroporation, making chemically competent and electrocompetent cells
- SDS-PAGE and Western Blot to validate expression of passenger proteins
- SPI-1 and SPI-2 secretion assays to validate protein expression in these two conditions
- Cell culture: maintaining mammalian cell lines
- Immunofluorescence Microscopy to validate localisation of the autotransporter on the outer membrane
- Literature search and scientific writing culminating in the production of a review paper
- Gained confidence in suggesting and planning future experiments

Imperial College London, London — Feb – July 2020

Final Year Project

- Wrote a research proposal outlining a 3-year biotechnology project on the development of a microbial catalyst for secondary plant metabolite production
- Undertook preliminary lab research that became the basis and background research of this proposal

Skills/Techniques:

- Protein purification using ammonium sulphate fractionation, gel filtration and anion exchange with an ÄKTA pure
- Planned the experiments and research project plan through a literature search
- Wrote my final year dissertation in the form of a research project proposal

Imperial College London, London — Jul – Sep 2019

Undergraduate Research Assistant under Professor David Holden

- Completed a 10-week research project funded by the Biotechnological and Biological Science Research Council (BBSRC)
- Independently investigated the effect of 16 *Chlamydia* virulence factors (effectors) with unknown functions on immune signaling pathways, cytotoxicity and localization
- Attended weekly seminars presented by post-docs and students working in the building detailing their current research allowing me to expand my knowledge and learn about novel techniques

Skills/Techniques:

- Cell Culture: maintaining mammalian cell lines
- Transfection of HEK and HeLa cells with plasmid DNA
- Flow cytometry to assess transfection efficiency
- Western blot to validate expression of protein
- Fluorescence Microscopy to assess localisation
- LDH Cytotoxicity Assay to investigate cell death
- Dual-Luciferase (Firefly-Renilla) reporter assay to assess effect on immune signalling pathway

Agency for Science, Technology and Research (A*STAR), Singapore Aug 2018
Research Intern under Professor Roger Foo

- Undertook a 4-week internship assisting in various post-doctorate projects focused on heart failure epigenetics
- Completed 4 week-long rotations, each week focusing on a different post-doc assisting and learning about their current research

amc! Experience, amc! Asia, Singapore Jul – Sep 2017
Project Executive

- Managed social media marketing for 25,000+ Facebook, 5,000 Instagram followers with a reach of over 1,500,000
- Production of event proposals and sponsorship decks; market research to identify 200+ potential sponsors for future events
- Analyzed major competitors within the sports events industry, compiled a report summarizing 50+ competitors

VOLUNTEER WORK

The Bombay Leprosy Project Society, United World College of South East Asia

- Head of communications of a team of students raising awareness and funds (~$5000 SGD) for a foundation in India working to rehabilitate patients with leprosy. Managed liaisons between the organization in India and my school to facilitate events.

Widhya Asih Foundation, Indonesia

- Worked alongside 3 other students to raise funds (~$1000SGD) for the renovation of the dining area in a childcare centre for in Bali. Funded travel to Bali to assist the renovation and tutor the children in English for a week during the Spring holiday.

Lakeside Family Services, Singapore

- Provided educational and emotional support to children from disadvantaged families in an afterschool care center once a week for a year. Tutored the children in Maths and English with a specific focus to improve their reading.

LEADERSHIP ROLES

Imperial College Hockey Club Female Mixed Captain (2019)

- Contacted and collaborated with other university hockey teams to organize and arrange matches
- Advised within a committee to plan events for and manage over 130 members

Imperial College Amnesty International Vice President (2019)

- Managed event planning, budgeting and publicity of the society
- Liaised with Imperial College Union, other Imperial College societies and other university Amnesty societies to organise fundraising and awareness events
- Identified and contacted external speakers to conduct educational talks, host discussions and skills workshops

INTERESTS & ACTIVITIES

Societies: Imperial College Amnesty International, Imperial College Hockey Club, Biochemistry Society, Synthetic Biology Society
Languages: English (Native), Mandarin (Intermediate), Spanish (Novice)
Technical Skills: Microsoft Office, RStudio, currently learning Python and MATLAB
Personal Interests: Managing a food blog with 1,000 followers, field hockey, rock climbing

REFERENCES

Professor David Holden
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Dr Ernesto Cota
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