**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**

Professor

Department of Infectious Diseases

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**Dr Ernesto Cota**

Senior Lecturer

Department of Life Sciences

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