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Sheffield  
S10 1XZ

Dr. B. Strong

Institute of Evolutionary Biology  
University of Leicester  
Longridge Laboratories  
Howarth Building  
Leicester LE1 3VT

6 February 2017

Dear Dr. Strong

**PhD: Host-parasite Interactions**

I would like to enquire about the possibility of starting a PhD with you in September 2017. I am currently in the fourth year of an MBIolSci Zoology degree at the University of Sheffield and enclose my CV for your consideration.

During my studies at Sheffield I have gained extensive research experience both through my course and also during summer work in research groups within the University. Paid work in two very different research areas, ecotoxicology (with Professor C. Meyers) and insect immunity (with Dr. S. Willis and Professor R. Kala), has given me valuable experience of both field and laboratory work. This experience has increased my commitment to a research career. It has also strengthened my interest in the areas of evolutionary biology and parasitology, and in particular host-parasite interactions. The fourth year Masters course at Sheffield will give me further experience of carrying out independent research, through a 9 - month lab project. This year will also provide the opportunity to learn skills useful for a career in research such as scientific writing, composing grant applications and advanced statistical analysis. I am predicated to graduate with a first class degree classification in July 2017.

My fourth year project (with Dr. N. Schulte) will look into the effect of antimicrobial peptides on bacterial mutation rates. This will give me experience of molecular biology techniques; skills which I am keen to develop further. I am particularly interested in working with you as it would provide the chance to combine my current interest in invertebrate immunity with the opportunity to gain more experience of molecular biology and genetics.

Your research on host-parasite interactions and the evolution of virulence is of great interest to me as it is an important field in current evolutionary biology research. My previous research experience has focused on the details of the invertebrate immune system and I would very much like to lead on from this by looking at genetic variation in immunity and how the host and parasite genotypes interact with the environment. I would also welcome the chance to start my research career at the University of Leicester, given its excellent research rating in this field.

I would very much value the opportunity to work within your group and combine my interest in invertebrate immunity with a genetic approach. I feel that my previous research experience has provided me with a good basis for research in this area, and I should therefore be grateful if you would consider my application.

Yours sincerely,  
Nicholas Keane

**Nicholas Michael Keane**

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## **Academic qualifications**

### **MBioSci Zoology at the University of Sheffield (September 2013 – present)**

- Averaging a 1<sup>st</sup> class degree qualification for modules taken so far.
- Fourth year research project and dissertation in the Evolutionary and Ecological Entomology Research Group supervised by Dr Neils Schulte, investigating the impact of insect antimicrobial peptides on bacterial mutation rates. Training in research skills including scientific writing, writing funding applications and advanced statistical analysis.
- Third year research project “The effect of gender and copulation on the level of immune response in the mealworm beetle *Tenebrio molitor*”. Supervisor Professor Ramvilas Kala. Project mark 75.
- Third year dissertation “Mechanisms Generating Gender Bias in the Parasitism of Vertebrates”. Supervisor Dr Liz Morgan. Dissertation mark 72.

### **Saint Martins, Gloucester (September 2005 – June 2012)**

- A-Level Biology (A), Psychology (A), Geography (B), and General Studies (B)
- AS level Chemistry (A)
- 10 GCSEs grades A\* - B including Maths and English

## **Research experience**

### **University of Sheffield Evolutionary and Ecological Entomology Research Group (June- September 2016)**

Awarded a Wellcome Trust undergraduate research summer studentship jointly supervised by Dr Susan Willis and Professor Ramvilas Kala. Investigated temporal variation and specificity in the production of anti-microbial peptides following an immune challenge in insects. Continued to be involved in this project and will be co-author on a publication currently in preparation.

### **University of Sheffield Ecotoxicology Research Group (June – September 2015)**

Summer Research Assistant supervised by Professor Charlotte Meyers. Working on a long term study jointly funded by the Highways Agency and the Environment Agency investigating the impact of contaminated particulate matter discharged from carriageway surfaces upon receiving surface waters. Involved setting up *in situ* bioassay and sediment toxicity tests to assess the ecological significance of sediment contaminants, collection and sorting of freshwater invertebrate samples, and preparation of sediment samples for chemical analysis.

## **Research skills**

### **Laboratory work**

- Bacterial culturing including sterile techniques and making of media for bacteria culture.
- Performing immune challenges on insects and immune response assays including: measuring the encapsulation response; zone of bacterial inhibition tests; and Malpighian tubule function assay.
- Insect dissection.
- Morphological measurements of insects.
- Maintenance of insect cultures.
- Fourth year project - the opportunity to develop practical techniques such as mutation rate assays.

### Field work

- Collection and preparation of sediment samples for chemical analysis.
- Measuring and recording of river properties including flow rates, sediment load, pH, oxygen content, and temperature.
- The use of surber samplers to analyse benthic stream organisms.
- Setting up and monitoring of *in situ* feeding assays with fresh water invertebrates as a shortterm sublethal biomonitor of water quality.
- A range of practical work with the Sheffield University Conservation volunteers including plant surveys, habitat management and helping to set up education programs.

### Other experience and positions of responsibility

- Sept 2015 – present: **Vice Chair of the University of Sheffield Conservation Volunteers.** Responsibilities include organising practical conservation tasks with groups such as Yorkshire Wildlife Trust, The Peak District Rangers and community projects such as FarmYard.
- Nov 2014 – present: **Student representative** at department open days, guiding prospective students around the University and answering parents' questions. Assisting with interviews for prospective students, co-ordinating departmental introductions and ensuring individuals attend interview on time.
- Sept 2012 – Aug 2013: GAP year.  
Six months **teaching English and Biology** at Science College, Malaysia. Planning and teaching lessons, designing extra tuition for individual students and organising extracurricular activities such as mini sports tournaments and quiz evenings for up to 60 students. - Six months as **Deputy Manager** at Real Living, Gloucester. Organising staff rotas, monitoring stock, balancing finances and managing daily operations in the Manager's absence.
- Oct 2013 – April 2015: Intermittent **bar work** for Whitbread brewery. Working as part of a small team in a busy bar, serving customers and dealing with any complaints which arose.

### Additional skills

- Full British driving licence
- PADI advanced qualified scuba diver

### References

#### Fourth year supervisor:

Dr Neils Schulte Email: nshulte@sheffield.ac.uk Tel: 0114 222 0000

#### Third year project and Wellcome Trust summer studentship supervisor: Professor Ramvilas Kala

Email: rkala@sheffield.ac.uk Tel: 0114 222 0000

#### Supervisor of summer work in ecotoxicology research group:

Professor Charlotte Meyers Email: cmeyers@sheffield.ac.uk Tel : 0114 222 0000

Address for all of the above:

Department of Animal & Plant Sciences, University of Sheffield