Matthew Dorman
Microbial Pathogenesis group, Wellcome Trust, Cambridgeshire

In 2015, with the aid of a Royal Society of Biology Travel Grant, I carried out vacation research into the pathogenesis and genetics of *Salmonella enterica* at the Wellcome Trust Sanger Institute, Hinxton, UK. I was hosted by the Microbial Pathogenesis Group, and participated in several lab-based projects during my eight week visit.

One project studied a putative membrane-associated protein in *Salmonella* Typhimurium, which has a domain capable of binding to sugar molecules. It was hypothesised that the protein was involved in *Salmonella* adhesion to human cells during invasion and infection. I assessed the role of this protein in *Salmonella* pathogenesis by constructing a number of mutant strains of *S. Typhimurium*, and then used several assays to assess the phenotypes of these mutants *in vitro* and *in vivo*. These experiments included biofilm formation assays, motility assays, immunoflourescent microscopy and epithelial cell monolayer invasion assays. In addition to these microbiological and molecular experiments, I also carried out a biochemical purification of the recombinant protein of interest from *Escherichia coli*, and used this to investigate the interactions of the protein with other molecules in immunoprecipitation-Western immunoblots.

Another project involved the design of a mouse infection experiment, to assess the relative fitness of a strain of *S. Typhimurium* deficient in a known pathogenicity effector protein*. S. Typhimurium* causes typhoid-like disease in the mouse, and many observations made in *S. Typhimurium* inform our research of S. Typhi, which causes typhoid in humans. Mice were infected with equal numbers of the mutant strain and a wild-type, and the ratios of mutant:wild-type in mouse organs four days post infection were assessed.

This was a unique opportunity for me to carry out independent work at one of the most prestigious genome research centres in the world. I had the opportunity to employ research techniques which few, if any, undergraduates will use in their standard degree training. The data from these projects will form part of a number of manuscripts for publication in the future. The chance to work in a place which fosters such a collegiate and collaborative approach to research was particularly enjoyable. The networking opportunities I had, and the chances for professional development, were second to none.

My experience has confirmed my suspicion that I want to proceed to postgraduate research in the area of microbial genetics when I finish my degree in 2016. Without the financial support from the Royal Society of Biology, it would not have been possible for me to make this trip. Since my placement has had such an effect on my career plans, I am indebted to the Society for its support. I would strongly encourage any fellow student contemplating a career in research to obtain experience as I did – although there are many frustrations involved in wet lab science, they are far outweighed by the reward of collecting robust data from successful experiments, even if the data are negative results.