



Title of PhD project	<i>Campylobacter</i> pathogenesis: Investigating the link between the Unfolded Protein Response and inflammation	
Supervisor	Dr Ozan Gundogdu	LSHTM
Co-Supervisor	Professor Brendan Wren	LSHTM
Brief description of project	<p>Infectious diarrhoea is a global problem, and <i>Campylobacter</i> is the most common bacterial cause responsible for ~400 million human cases every year. Despite its importance, the cellular mechanisms by which <i>Campylobacter jejuni</i> infection promotes inflammation and disease remain unclear. We have recently demonstrated that <i>C. jejuni</i> activates the host unfolded protein response (UPR). We propose that activation of UPR is the primary driver of inflammation and will investigate this by combining molecular microbiology, immunology and omics-based approaches with a novel murine infection model. Our interdisciplinary proposal will lead to a deeper understanding and better control of this important infectious disease.</p>	
Skills we expect a student to develop/acquire whilst pursuing this project	<p><i>Molecular Biology</i> – To functionally characterise the <i>C. jejuni</i>, the doctoral candidate will learn how to create define isogenic mutants and complementation of strains. A range of phenotypic assays will be performed including growth kinetics, stress assays, kill assays and interaction assays with chicken and human tissue cell lines.</p> <p><i>Bioinformatics</i> – The project will incorporate many omics-based technologies e.g. transcriptomics, interactomics and genomics to help answer relevant research questions. Sequencing will be followed by the opportunity to run and develop bioinformatic pipelines and statistical analyses methods using UNIX, python and R.</p> <p>As well as key scientific skills, development of core transferrable skills are core tenets of the LSHTM doctoral programme. The student will join the <i>Campylobacter</i> research group and be provided with world-class training that will lead to them becoming an independent scientist. They will have the option to attend MSc modules which may be relevant to their research project. In addition, the student will attend relevant courses/workshops to understand the value of</p>	

	<p>knowledge transfer and the value of intellectual property (IP). The student will be able to take part in numerous courses provided by the Teaching and Education Development (TED) team based within the School. Meetings and social events are organised at intervals throughout the year to encourage students to get to know each other and to develop a supportive environment.</p>
Particular <u>prior</u> educational requirements for a student undertaking this project	The doctoral candidate should have completed an undergraduate and postgraduate degree related to microbiology.
Project key words	<p>Campylobacter Gastroenteritis Diarrhoea Unfolded Protein Response (UPR)</p>
Possible under 1+4 route? Master's options identified.	<p>Yes LSHTM – MSc Medical Microbiology</p>
MRC Core Skills developed through this project	<p>Interdisciplinary skills Whole organism physiology</p>
MRC LID themes	Infectious Disease
Further reading	<p><u>Revisiting <i>Campylobacter jejuni</i> Virulence and Fitness Factors: Role in Sensing, Adapting, and Competing</u></p> <p><u><i>Campylobacter jejuni</i> outer membrane vesicle-associated proteolytic activity promotes bacterial invasion by mediating cleavage of intestinal epithelial cell E-cadherin and occludin</u></p>