Title of PhD project	**Unravelling the genetic basis of ageing and development of interventional approaches through CRISPR-CAS embryonic gene editing in a novel clonally reproducing insect model**	
Supervisor	Dr Matthew Yeo	LSHTM
Co-Supervisor	Professor Susana Campino	LSHTM
Brief description of project	Ageing (senescence) is a complex multifactorial process affecting multicellular eukaryotic organisms. Over time senescence results in an inexorable decline in all physiological systems leading to morbidity and death. At a societal level disease associated with human ageing are a cause of enormous physical suffering and negatively affects the global economy. Here we apply comparative genomics, transcriptomics and gene editing approaches applied to a novel clonally reproducing insect model (*Acyrthosiphon pisum,* Pea Aphid). We will answer fundamental questions on the nature of ageing by comparing multiple clonal offspring to their ageing parent and identify markers associated with physiological "fitness" for subsequent gene editing. Transgenic approaches will be applied via CRISPR-Cas9 mediated microinjection of insect embryos to manipulate genes associated with longevity and physiological markers of "fitness". In summary the project will contribute to interventional approaches to reduce the catastrophic physiological decline due to age related diseases.	
Skills we expect a student to develop/acquire whilst pursuing this project	Development of gene editing technologies (CRISPR-Based), comparative and functional bioinformatics, genomic analysis and gene editing in invertebrates.	
Particular prior educational requirements for a student undertaking this project	Experience with basic molecular biology and interest in bioinformatics. Entomological interest and/or experience would be desirable.	

Project key words	Ageing Gene editing CRISPR Entomology Bioinformatics Genomics
Possible under 1+4 route? Master's options identified.	No
MRC Core Skills developed through this project	Interdisciplinary skills Whole organism physiology
MRC LID themes	Global Health