Title of PhD project / theme	**Genetic dissection of the role of UBP-1 in *Plasmodium falciparum* malaria parasites**
Supervisory team	Richard Culleton (NU) Colin Sutherland (LSHTM)
Brief description of project / theme	Malaria parasites exhibit extensive genetic polymorphism between strains. This polymorphism often leads to phenotypic differences between strains which can include resistance to antimalarial drugs. Polymorphisms in the *pfubp1* gene have been linked to artemisinin and chloroquine resistance *in vitro* and *in vivo,* but the function of this gene has not been systematically evaluated to date. The demonstration that CRISPR/Cas9 gene editing can be carried out successfully and efficiently in malaria parasites enables new experimental approaches to be adopted for elucidating the cell biology of these important pathogens. We have preliminary evidence from gene editing of *pfubp1* that artemisinin susceptibility in vitro is affected by certain polymorphisms close to the catalytic site at the carboxy terminus of the encoded protein. The proposed project will utilise these lines, and newly constructed reported gene lines, to advance understanding of this important protein in *P. falciparum* using *in vitro* cultures. The potential scope of this project is broad, and the student will have the opportunity to steer the research in the direction of their interest. Key techniques will include CRISPR-Cas9 gene editing, drug susceptibility testing, FACS, and fluorescent imaging work.
Particular *prior* educational requirements for a student undertaking this project	It would be advantageous, although not strictly necessary, for the student to have experience of working with in vitro cell culture.
Skills we expect a student to develop/acquire whilst pursuing this project	Malaria parasite culture techniques. Manipulation and phenotypic characterisation of malaria parasites in vitro. Genetics, genomics, bioinformatics and molecular biology techniques. Advanced cell imaging.