PhD PROGRAMME IN:

SYSTEMS BIOLOGY IN IMMUNE AND INFECTIOUS DISEASES

Course title:	**CRISPR and Gene Drive – From origins to applications in research and medicine**
Aim of the course:	To provide an overview of the discovery of CRISPR/Cas9 and its current and future applications in biology and ecology
Lecturer:	Dr. Matthew Peirce
Venue:	to be defined
Course Program:	**Module 1: CRISPR – from origins to applications in research and medicine** **Genome editing tools** ES cells and gene targeting Examples of site-specific nucleases used in genome editing Pros and cons of different genome editing tools Examples of applications **CRISPR** Discovery of CRISPR Natural role of CRISPR in bacterial adaptive immunity Anti-CRISPR proteins Adaptation of CRISPR as genome editing tool **Improving and developing CRISPR for different genome editing approaches** Off target effects Increasing specificity Dependency on DNA repair pathways Non-cutting applications of CRISPR Novel CRISPR systems

	Module 2: Insect vector-borne diseases **Vector-borne diseases** Overview of hematophagous insects and role in transmission Ancient and emerging vector-borne diseases Dengue/Malaria/ Sleeping Sickness **Understanding Vector Biology and Genetics** Vector: Parasite Molecular Interactions Insect transgenesis Understanding gene function **Genetic control of insects to control disease** Sterile Insect Technique Gene drive Challenges facing novel genetic control approaches
Target audience:	The course is mainly meant for PhD students in Systems Biology in Immune and Infectious Pathologies PhD programme. However, the course is open to all scientists with an interest in the issue.