Ref: 07/TR
Closing Date: 16.02.26 (close of business)

Project Title: Development of Orthoflavivirus replicon systems to investigate infection dynamics in different hosts

Supervisors: Taissa Ricciardi-Jorge and Trevor Sweeney
Research group: Viral Gene Expression

Project Summary:

This research proposal is centred on developing and validating novel tools for the study of Japanese encephalitis virus (JEV) to investigate pathogenic determinants of emerging zoonotic viruses.

Orthoflavivirus japonicum, aka Japanese encephalitis virus, is transmitted by mosquitoes (*Culex* sp.) to a wild variety of birds (e.g. egrets and herons) and mammals (e.g. humans, bats, pigs, and horses). JEV and closely related viruses (such as West Nile virus and Usutu virus) are classified as high-containment pathogens (ACPD3 and Schedule 5), which makes their study onerous and limited. Herein, we will develop and characterise non-infectious subgenomic JEV replicons- replicating RNAs that do not form infectious virus- that will allow the study of these viruses at lower containment (ACPD2), providing invaluable tools to advance research in the field. Once optimised and validated, these replicons will be used to explore questions related to virus replication and/or virus-host interactions.

Further Details:

This project is structured in two parts: a development phase and a hypothesis-driven phase, designed to provide the intern with strong foundational wet-lab training, while also granting the student freedom to pursue questions of interest within the framework of the newest JEV-centred research line.

The development phase involves the generation of replicon plasmids containing reported genes and mutations of interest; and the optimisation of these constructs for expression into different cell lines (mammals and insect). The hypothesis-driven phase involves using these tools to pursue and interrogate aspects of virus replication and the host immune response.

The student will be hosted by a small and very supportive team with strong expertise in molecular virology and will have the opportunity to learn a range of valuable and versatile methods and professional skills including:

- molecular biology
- cell culture
- light microscopy
- flow cytometry
- scientific method and laboratory good practices.

References for Suggested Reading:

- Viral replicons as valuable tools for drug discovery - PMC
- Molecular pathogenesis of Japanese encephalitis and possible therapeutic strategies - PubMed
- Zika virus noncoding RNA cooperates with the viral protein NS5 to inhibit STAT1 phosphorylation and facilitate viral pathogenesis - PubMed

To Apply: See How to apply. Closing date: 16.02.26 (close of business)