FACULTY of NATURAL SCIENCES
GRADUATE SCHOOL

Keele University

Research Project Proforma (School of Medicine)

Submit this form electronically to l.j.cartlidge@keele.ac.uk by 31st July 2015

Research Title:	**Functional genomics of dengue vectors in Brazil targeting the olfactory and immunity systems**
Keywords (up to 5)	**Mosquito, Olfaction, Immunity, Dengue, Genetics**
Supervisor:	Dr. Julien Pelletier (Keele); Dr. Jayme Souza-Neto (Botucatu)
Job Title:	Lecturer (Julien); UNESP Vectomics group leader (Jayme)
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Type of projects offered (delete as appropriate)	Studentship (4-8 weeks) Intercalation (one year)

(1) Outline the broad aims of your research and its medical relevance (150 words)

Mosquitoes can transmit multiple diseases and represent a main threat to human health worldwide. The absence of efficient vaccines and the development of insecticide resistance in vector species create a need for novel environmentally-friendly strategies to control mosquito populations in the field. In mosquitoes, the olfactory and immunity systems are critical regarding the transmission of diseases to humans. Olfaction promotes the vector's capacity to specifically locate and bite humans, whereas immunity directly influences the insect's susceptibility to carry pathogens. The main aim of the research is to exploit molecular entomology approaches to better understand the genetic factors that contribute to the transmission of dengue virus by the mosquito *Aedes aegypti* in a country where the disease is endemic, Brazil.

(2) Indicate the skills/techniques the student will learn (100 words)

The projects will exploit a combination of transcriptomics, molecular biology, mutagenesis and behavioural approaches aiming at characterizing important proteins contributing to the transmission of diseases at the vector level, by focusing on the olfactory and immunity systems of the mosquito *Aedes aegypti*. Different techniques will be employed, including insect dissection, RNA sequencing, cloning, real-time PCR, RNAi, CRISPR-mediated mutagenesis, embryo microinjection, bioinformatics, physiology and behaviour assays. Projects can be conducted in Both Keele and/or Botucatu, São Paolo state, Brazil.

Please ensure that appropriate project costs are in place before submitting this form. You may need to discuss this with your HoS and the Faculty Research Director.

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