Proposal PhD Studentship project

Title: **Traumatic brain injury – characterization of experimental models of brain injury and exploration of new compounds with neuroprotective potential**

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Background
Traumatic brain injury affects a significant number of patients worldwide, and is a major cause of mortality and morbidity in patients who are under 50 years old. Head injury occurs both in the civilian and military context. The neurological impairment which follows head injury leads to a significantly reduced quality of life for patients and is associated with a significant socioeconomic cost and a great personal burden for the patient and carers. The treatment of the acute phase of traumatic brain injury remains a significant clinical unmet need worldwide.

The project will be based on our on-going research on pathogenetic mechanisms underlying neurotrauma, and on the development of innovative neuroprotection strategies (see below selected references). The Centre for Neuroscience and Trauma has a reputation of international excellence in spinal cord injury work, and has several on-going translational projects in this field. This doctoral project will initiate a parallel area of investigation of head injury, an injury associated with pathological mechanisms similar to those associated with spinal cord injury.

Aims
The project aims to validate and compare different models of head injury in rodents: penetrating, non-penetrating and non-impact. It will then assess the neuroprotective effects of a broad range of agents, e.g. polyunsaturated fatty acids, new metal-binding compounds and cannabinoid analogues. The injury and the effects of the treatment will be assessed using relevant behavioural tests and tissue analysis. The project will also explore potential early biomarkers of head injury, which could be used subsequently in the clinic, and will aim to develop non-invasive in vivo imaging approaches for the longitudinal monitoring of injury.

The Royal London Hospital is a leading centre for the integrated management of trauma and is renowned internationally for its excellence in this field. The student will be part of an active pre-clinical research group and will also have an opportunity to interact regularly with trauma clinicians.

References

Skills developed during the doctoral studies:
neurosurgery, behavioural analysis, immunocytochemistry, genomic and proteomic analysis, imaging techniques