

Name of Research Group:  
Nerve Gut Research Laboratory

Name(s) of supervisors:  
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Description of current research interests:

The Nerve Gut Research Laboratory aims to improve treatment of digestive diseases by identifying and understanding the interactions between the nervous system and the gastrointestinal (GI) tract, and to promote translational research from single cells through to patients. Several conditions would benefit from treatments that modify signalling of sensory information from the gut to the brain. In functional gastrointestinal disorders, such as irritable bowel syndrome, patients are hypersensitive to the contents of the gut and its movements. In reflux disease there are disordered reflexes from the stomach to the lower oesophageal sphincter that allow backflow of stomach acid into the oesophagus. In diabetes, patients show exaggerated responses of the gut to glucose in the diet, accompanied by profound symptoms. In obesity, they show reduced signalling of nutrient from the gut to the brain.

The group is investigating signalling in sensory pathways in several ways. First, the release of mediators from epithelial and immune cells. Second, the direct action of mediators and nutrients on sensory nerve endings. Third, the function of the nerve ending and how it is modulated by receptors, ion channels and signal transduction pathways. Fourth, the actions of transmitters released by sensory nerves from their endings within the brain and spinal cord.

Title and short description of project offered for 2009

### Satiety signals from the stomach

Obesity is a national priority area for research, and controlling satiety signalling is an important target in its treatment. The most successful current treatment for obesity is bariatric surgery which targets the stomach by restricting its volume, resulting in a smaller meal being required to give the same feeling of fullness. Vagal sensory nerves in the stomach are responsible for these feelings of fullness. Determining how gastric peptides known to influence food intake interact with vagal sensory nerves is the subject of this project, along with investigating how these interactions change in obesity. To achieve this we will first determine expression of peptidergic (leptin, ghrelin and NPW) receptors in gastric sensory neurones and the effect of leptin, ghrelin and NPW on their electrophysiological responses to mechanical stimuli. Then we shall determine changes in function of afferents in obesity and changes in expression of leptin, ghrelin and NPW receptor mRNA.

Key references:

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