



## WEEK 8 (Lab 3): Neuronal control of gastrointestinal smooth muscle



### This lab:

1. Will be assessed in-class (1%) via the PHY2032 Gut Lab in Class worksheet 2024.doc (download from Week 8 Moodle Real-Time section)
2. Provides the theoretical background for your individual presentation on a gastrointestinal motility disorder (15%).

### Safety guidelines

This laboratory uses animal tissues. Students are reminded that tissues should be handled with care, and must be assumed to be infectious. The Department of Physiology adopts 'Universal Precautions' as a means of minimising risks to students. This means that students must wear laboratory coats and appropriate shoes. Drugs are used and will be added to the organ bath with pipettes. Students are required to wear lab coats, goggles and gloves while handling these items. Pipette tips are to be disposed of in the sharps bin, gloves are to be disposed of in the biohazard bins.

## INTRODUCTION

### Gut Motility

The main function of the gastrointestinal (GI) system is to chemically breakdown (i.e., digest) food and to absorb nutrients, electrolytes and water into the body. Ingested food needs to be moved along the gastrointestinal tract (GI-tract) and this is controlled by nerves and hormones. This process of gut motility (i.e., contraction and relaxation of the gut smooth muscle) is regulated by the enteric nervous system. Information (e.g., stretch of the gut wall) is taken in via sensory nerves, analysed and changes in motility are achieved via the actions of efferent enteric nerve fibres (i.e., myenteric nerves) terminating on smooth muscle in the GI-tract. In this laboratory you will use the isolated rat ileum to study how the enteric (myenteric) nerves control intestinal motility. You have learnt about intestinal motility in your gut lectures (see figure 1). In this laboratory, you will also learn general principles of how nerves use neurotransmitters for communication and how neurotransmitter action on smooth muscle can be blocked and mimicked with specific drugs.

A



B



**Figure 1.** These images show types of gut motility in the intestines. (A) Peristalsis - migrating myoelectric complex (small intestine); mass movement (large intestine). (B) Mixing contractions - segmentations (small intestine); haustral (large intestine).

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# Gallopers Gut Lab Answers

**Margaret Waterman**



**Gallopers Gut Lab Answers:**

*Biological Inquiry* Margaret Waterman, 2005

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