

Introductory Remarks to Symposium 1

Gut-brain signalling: from sensory cell biology to animal behaviour

Cordelia Imig and Benjamin Cooper, Copenhagen (Denmark) and Goettingen

Gut-brain signalling is important for the regulation of physiology and behaviour. This is particularly relevant in the context of brain states, including appetite and satiety, and consequential feeding behaviour. Important cellular components of the gut-brain axis are enteroendocrine cells (EECs) of the intestinal epithelium. EECs secrete various peptide hormones and neurotransmitters in response to a range of sensory stimuli (i.e. nutrients, force, microbes and their metabolites, toxins and pathogens). In addition to endocrine signalling, EECs are thought to communicate via synapse-like connections with neurons signalling to the brain. Strikingly, we are only beginning to understand the fundamental biological processes that determine gut-to-brain signalling in different physiological and pathophysiological contexts.

In this symposium, the speakers will focus on how i) distinct subclasses of cells register different sensory modalities in the periphery, ii) this information is relayed to the body and the brain, and iii) gut-to-brain signalling in health and disease modulates physiology, behaviour, and metabolism. The speakers will highlight various state-of-the-art methodologies for the study of gut signalling in flies, mice, and humans. The talks will cover molecular and cellular mechanisms that determine how cells detect and process modalities such as mechanical stimulation or nutrients in the gut or hemolymph, and how gut-brain communication modulates appetite and feeding behaviour *in vivo*. Together, the speakers will discuss their respective views on how fundamental molecular, cellular, and functional properties underlying directed information flow along the gut-brain axis in different physiological and neurobiological contexts will help to treat disorders associated with defective gut-brain signalling.

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Symposium 1

Wednesday, March 22, 2023
15:15 -17:15, Lecture Hall 8

Chairs: Cordelia Imig and Benjamin Cooper,
Copenhagen (Denmark) and Goettingen

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| 15:15 | Opening Remarks |
| 15:20 | Constanza Alcaino, Cambridge, UK
TRUST YOUR GUT: AN INTESTINAL SPECIALISED EPITHELIAL SENSORY CELL IS LOOKING OUT FOR YOU (S1-1) |
| 15:45 | Van Lu, London, Canada
SIGNALLING CROSS-TALK BETWEEN GLUCAGON-LIKE PEPTIDE-1 (GLP-1) RELEASING ENTEROENDOCRINE CELLS AND VAGAL AFFERENT NEURONS (S1-2) |
| 16:10 | Rituja Bisen, Wuerzburg
EFFECTS OF DIET AND FOOD-RELATED OLFACTORY CUES ON THE ACTIVITY OF INSULIN PRODUCING CELLS IN <i>DROSOPHILA</i> (S1-3) |
| 16:25 | Lisa Beutler, Chicago, USA
OBESITY-MEDIATED DYSFUNCTION OF GUT-BRAIN DYNAMICS (S1-4) |
| 16:50 | Kim Rewitz, Copenhagen, Denmark
GUT SIGNALING IN THE REGULATION OF ANIMAL BEHAVIOUR (S1-5) |