



## MANCHESTER NEUROSCIENCE SEMINAR SERIES

FROM THE UNIVERSITY OF MANCHESTER

# MATTHEW BURGESS

Matthew is a PhD in the Petersen Lab

This Seminar will be hosted by Dr Nina Milosavljevic

### TITLE: FUNCTION OF SENSORY CORTEX DURING NATURAL BEHAVIOUR IN FREELY MOVING MICE

Sensory systems have evolved to solve computational challenges that animals face during behaviour in their natural environments but their function has most often been studied in head-fixed animals whose movements are highly constrained. We set out to study how whisker-related Somatosensory Cortex (wS1) functions in freely moving mice, engaged in natural tactile exploratory behaviour. In this seminar, I will present our findings showing that neural activity in wS1 is substantially modulated by body state (configuration of individual body-parts and their derivatives), even in the absence of whisker afferent input. These results differ markedly from expectations based on anaesthetised or awake head-fixed animals. They suggest that sensory cortex functions not simply to process its afferent sensory drive but to do so in the context of a rich representation of the body and its behaviour, and that the brain mechanisms of sensation are fundamentally integrated with action.

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**27•NOV•2024 | 14:00 - 15:00**

**Michael Smith Lecture Theatre**  
in conjunction with Jessica Rodgers

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**EVERYONE WELCOME**



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# JESSICA RODGERS

Jessica is a Postdoc in the Lucas Lab

This Seminar will be hosted by Dr Nina Milosavljevic

### TITLE: OPTOGENETIC THERAPIES FOR VISION RESTORATION

Loss of light-sensitive rod and cone photoreceptors is a leading cause of blindness. Optogenetic gene therapy is a promising approach for vision restoration in late-stage retinal degeneration. Here, the missing visual input is replaced by genetically engineering surviving retinal neurons to express light-sensitive proteins called opsins. One important decision that could affect the quality of restored vision is the target cell type. However, we currently lack a direct comparison of different targeting strategies. To address this, we performed electrophysiological recordings in retinal explants and the visual thalamus of anaesthetised mice. We compared visual responses in retinally degenerate mice with widespread optogenetic expression in either ON bipolar cells or retinal ganglion cells. In this talk, I will present data demonstrating the impact of target cell type on the ability to encode information about different visual features.

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