

BCHM 421/422 – 2019/2020

Project Title: Profiling circadian rhythms in sensory neurons

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Project Outline: We have shown that mice do not respond to heat pain at night in the naïve state, and they do not respond to mechanical pain during neuropathic conditions. Circadian rhythms regulate their effects through the master control gene *Bmal1*. Our results show that significant changes in gene expression occur in the sensory neurons that sense this pain. As such, we are developing a new mouse strain *lacking Bmal1 specifically in sensory neurons*. These mice will have normal circadian rhythms in all cells and tissues, except in the neurons that control pain sensitivity.

Project Goals: Understanding how *Bmal1* controls gene function in sensory neurons is the goal of this project, using various methodologies to identify key genes of interest and changes to molecular and cellular responses before and after injury.

Experimental Approaches: qPCR; Microarray analysis; flow cytometry; bioinformatics; immunohistochemistry; pain; circadian rhythms

References: Segal JP, Tresidder KA, Bhatt C, Gilron I, Ghasemlou N. [Circadian control of pain and neuroinflammation](#). J Neurosci Res. 2018 Jun;96(6):1002-1020

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Ghasemlou N, Chiu IM, Julien JP, Woolf CJ. [CD11b+Ly6G- myeloid cells mediate mechanical inflammatory pain hypersensitivity](#). Proc Natl Acad Sci U S A. 2015 Dec 8;112(49):E6808-17.