Center for Neuroscience, IISc

Public Lecture

by Rishika Sharma

Survival over suffering: How hunger, thirst, and fear can quiet enduring pain

Faculty Hall

30th June , 2026

4:00-5:15 PM

followed by high-tea

Organised by the Center for Neuroscience, Indian Institute of Science, Bengaluru

In this talk, I will describe recent work from our lab that addresses two questions in neuroscience: 1) how does the brain prioritize perception and behavior in a dynamic world and 2) how are prolonged pain states encoded? Through a combination of systems, behavioral, and computational neuroscience, we have identified a neural node where various survival behaviors are prioritized and identified a cell-type within that node that encodes persistent pain. I will describe cellular, molecular, circuit-manipulations, behavioral neuroscience and computational neuroscience experiments that identify a key population of neurons and a key receptor on these neurons that regulates enduring pain states. We find that enduring pain is endogenously downregulated by competing acute need states such as hunger, thirst or acute threats and fear. These competing states suppress pain by activating NPY Y1 receptors on neurons in the hindbrain, which invariably lead to a reduction in pain responses and pain behaviors. Taken together, this work identified endogenous analgesic circuits in the brain demonstrating there are natural pathways for pain reduction that may be leveraged for analgesia in a translational context.

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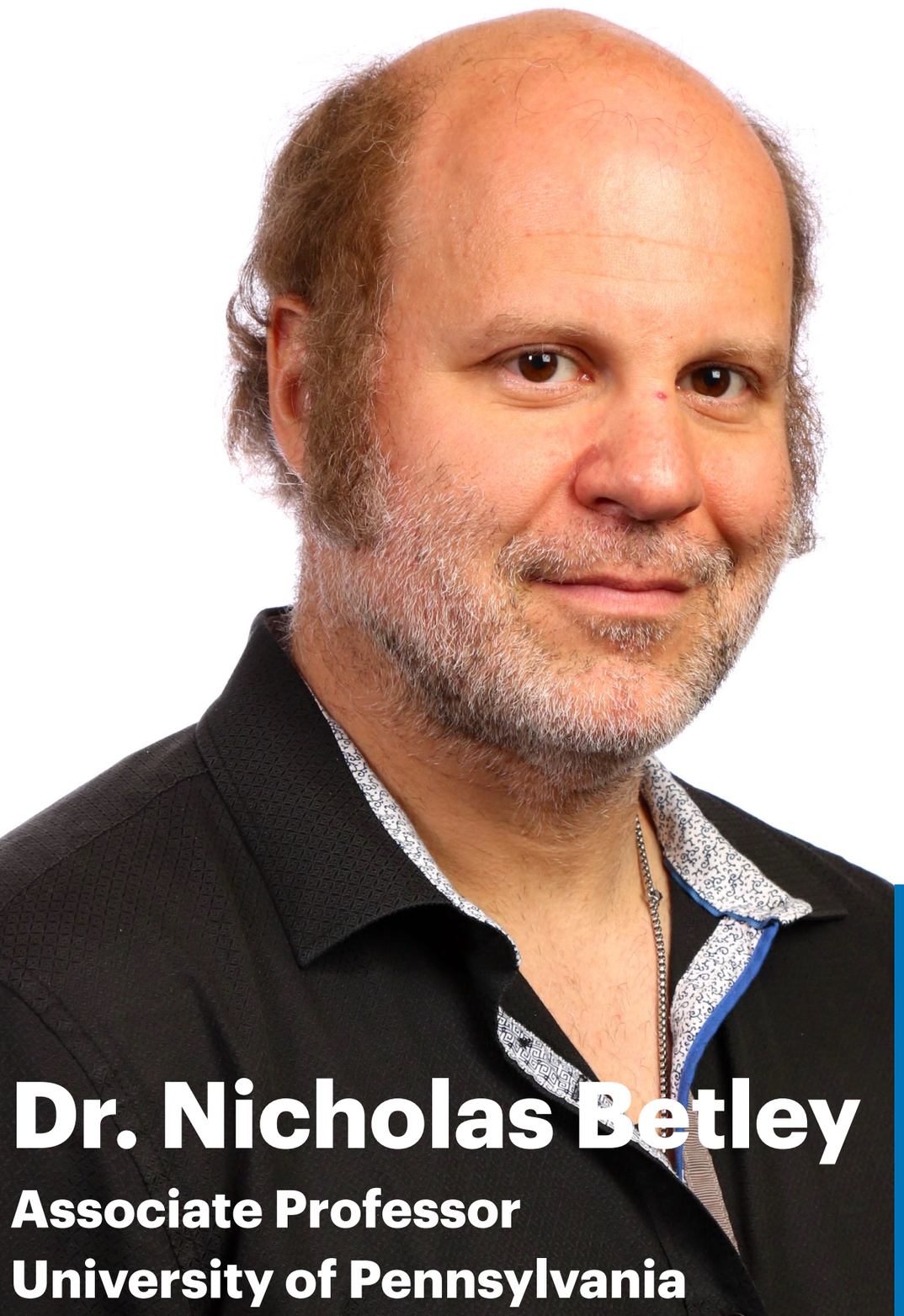

Dr. Nicholas Betley

Associate Professor

University of Pennsylvania

About the speaker

Nick's research spark ignited as an undergraduate studying how molecular codes shape nervous system assembly. He earned a Ph.D. at Columbia University, probing how neural circuits form, then joined Janelia Research Campus with Scott Sternson to examine feeding-related circuits. Since 2015 at the University of Pennsylvania, his lab has explored how reciprocal body-brain signaling drives behavior in a dynamic world. His work has been widely recognized, and he founded the BrainBodyBiome Initiative to foster collaborations on body-brain interactions. Beyond academia, Nick co-founded Spyridon to translate discoveries into real-world impact, focusing on exercise motivation and health.

The 7th Bangalore Cognition Workshop

2026