

## 2026 Kieval Lecture

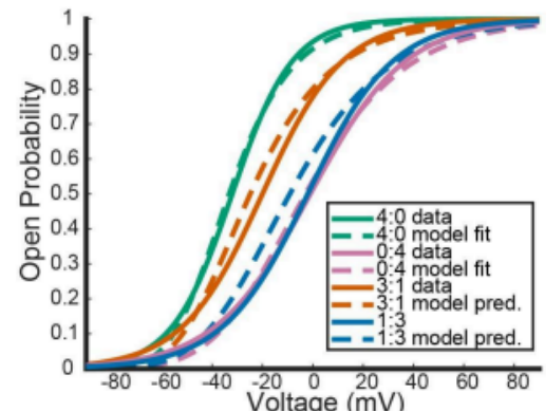
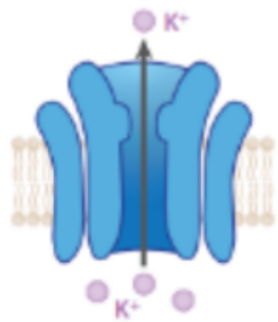
# HOW TO MAKE A NEURON SPIKE: ION CHANNELS AND THEIR MODELS

Dr. Kees McGahan is a postdoctoral researcher at Boston University specializing in computational neuroscience and mathematical modeling. His work uses mathematical models to study brain function, neurological disorders, and the role of neurons and ion channels.

### TALK HIGHLIGHTS

#### ✓ IN THIS LECTURE, DR. MCGAHAN WILL DISCUSS:

- How neurons generate and transmit electrical signals called action potentials
- The groundbreaking Hodgkin-Huxley models that transformed neuroscience
- How ion channels regulate communication within the brain
- Building mathematical and Markov models to study potassium channel behavior
- Using computational simulations to predict the effects of genetic mutations on brain function



### EVENT INFO:

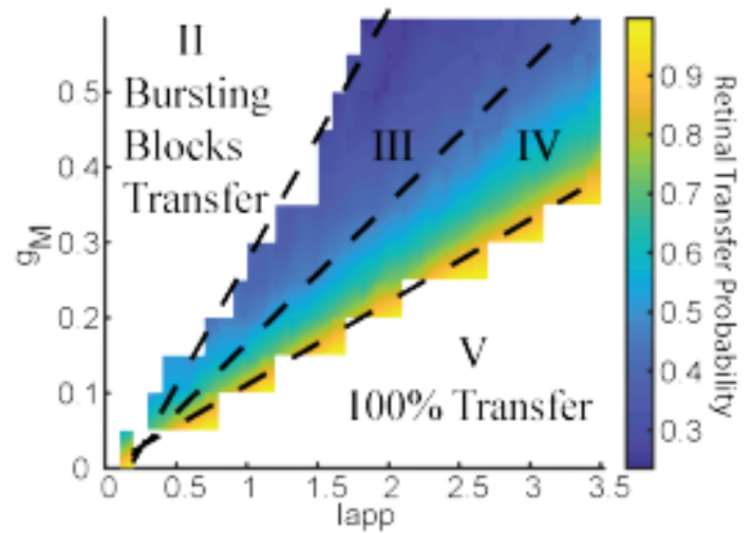
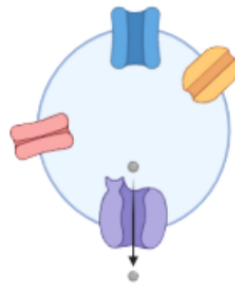
- 📍 **Wednesday May 27<sup>th</sup>**  
**3:30 – 5:00 PM**
- 📍 **In SC 151 Science Auditorium**

**Free and open to the public!**

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# MODELING THE THALAMUS: DYNAMICS, SIGNAL PROCESSING AND DISEASE IMPLICATIONS

Dr. Kees McGahan will explore how computational models can deepen our understanding of the thalamus, a key brain region involved in sensory processing and neural rhythms. Using experimental data and mathematical modeling, he will examine the thalamus's role in signal filtering, information processing, and the neurological effects of disrupted function.



## Topics Covered:

- The thalamus's role in brain rhythms and sensory processing
- Building and calibrating ODE models from experimental data
- How the thalamus filters and transmits neural signals
- Using dynamical systems theory to identify functional states
- How disrupted thalamic dynamics may contribute to neurological disorders

## Event Info:

- Thursday May 28<sup>th</sup>
- 1:30-3:30 PM
- In SC 108