

Characterization Of Spinal Cord Lamina I Projection Neurons: Electrophysiological Responses To Cutaneous Stimuli

Fong Hei Law¹, Junichi Hachisuka¹ (Supervisor) ¹School of Psychology and Neuroscience, University of Glasgow

Introduction

How does the nervous system differentiate between mechanical, thermal, and noxious sensations?

Excitatory projection neurons (PNs) transmit somatosensory signals from the spinal cord to the brain

Interneurons synapse onto PNs providing modulation

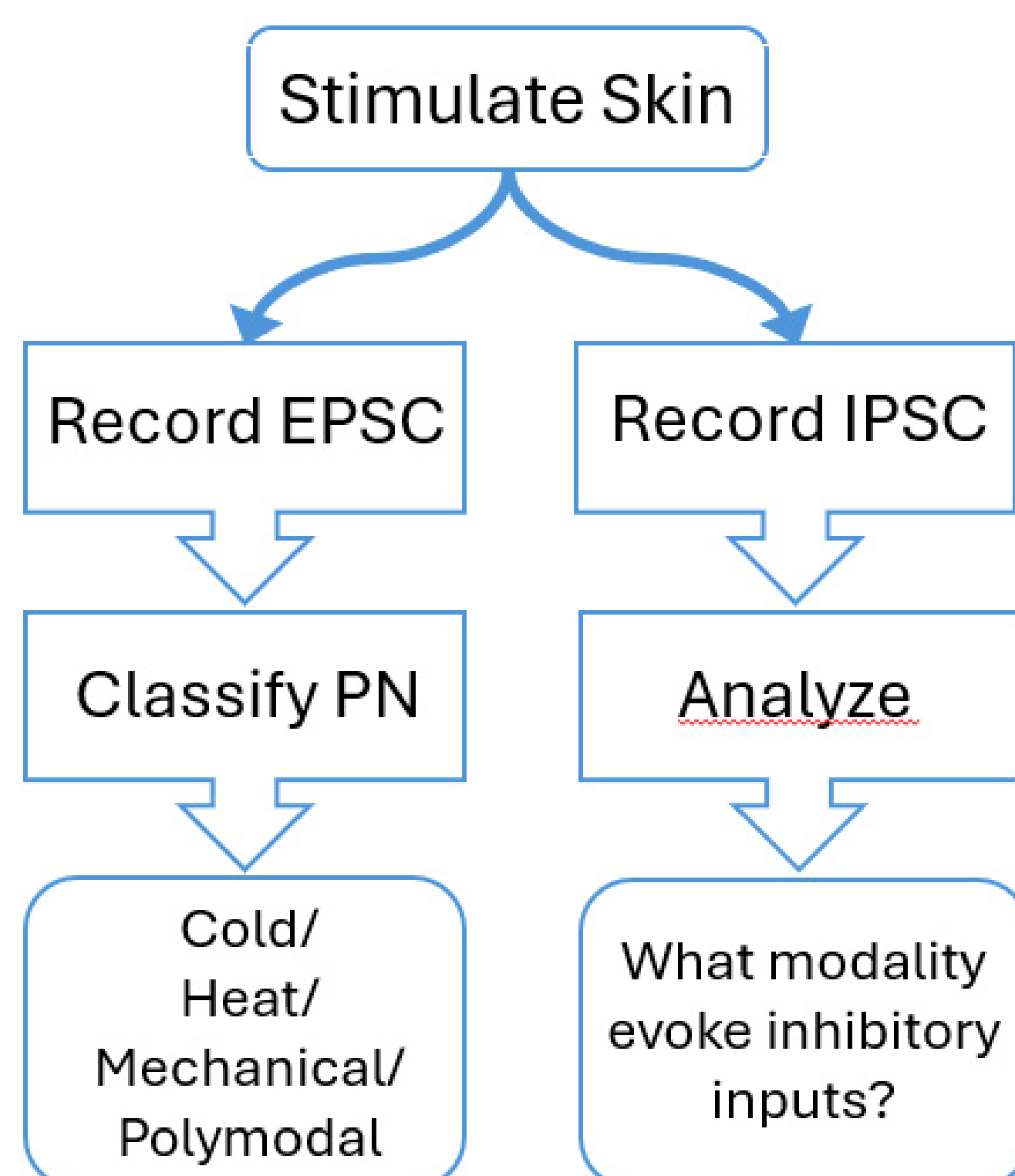
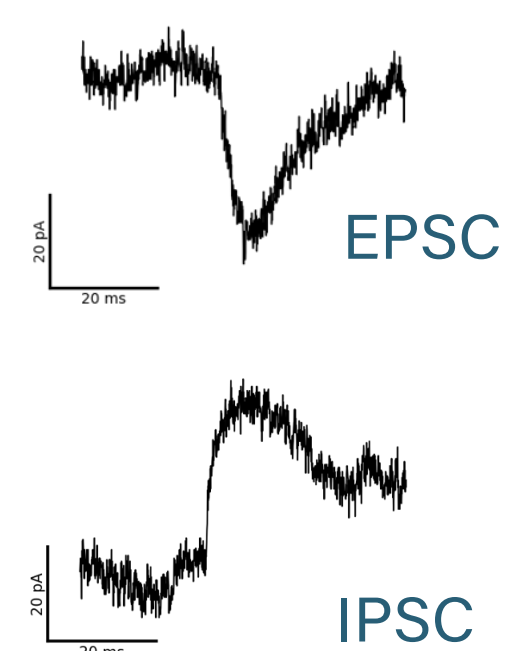
Do inhibitory interneurons selectively modulate PNs based on the PNs' cutaneous response properties?

Method

Phox2a::Cre Crossed Mice



Patch-clamp PNs

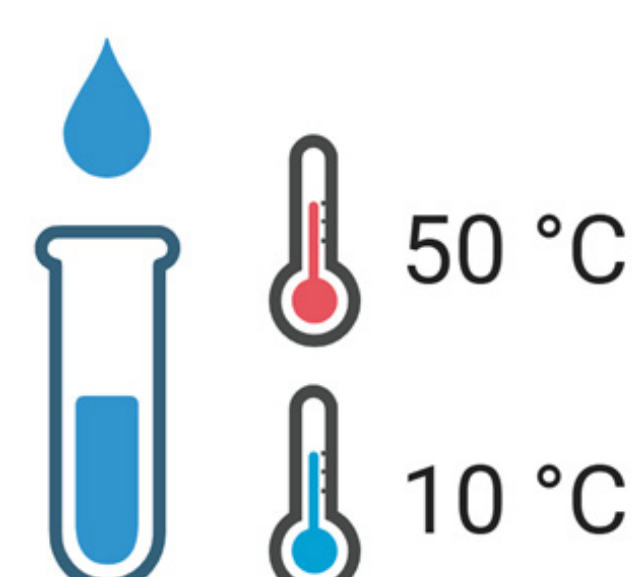


Semi-intact ex vivo preparation

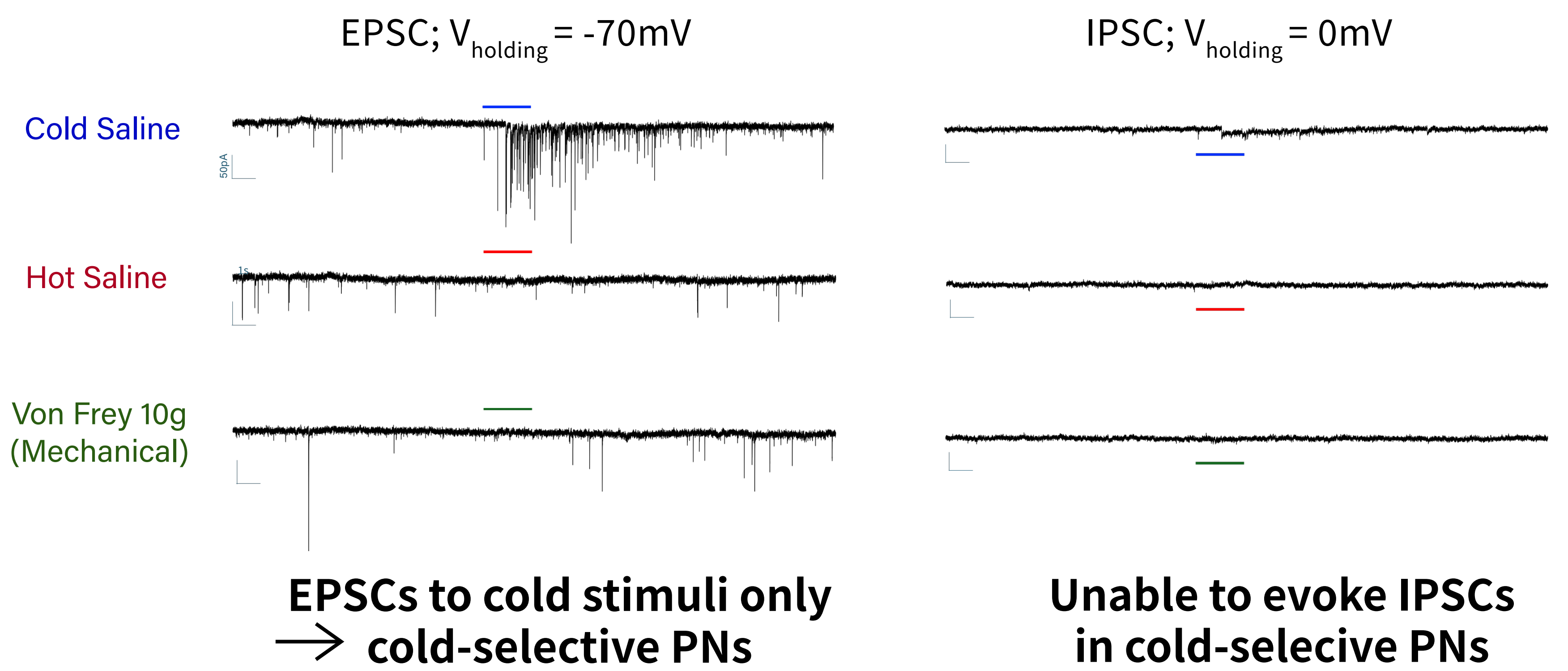


Mechanical Stimulation:
Brush/Von Frey Filament

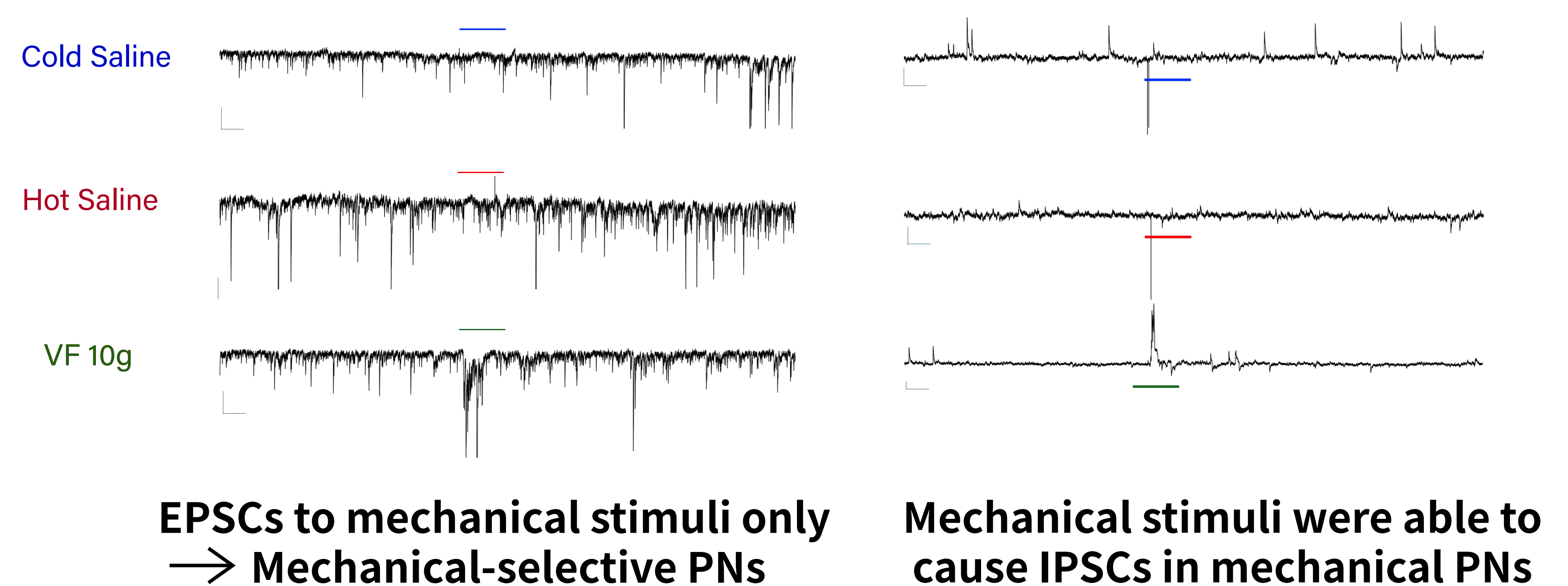
Thermal Stimulation:
Cold/Hot Saline
(10-50°C)



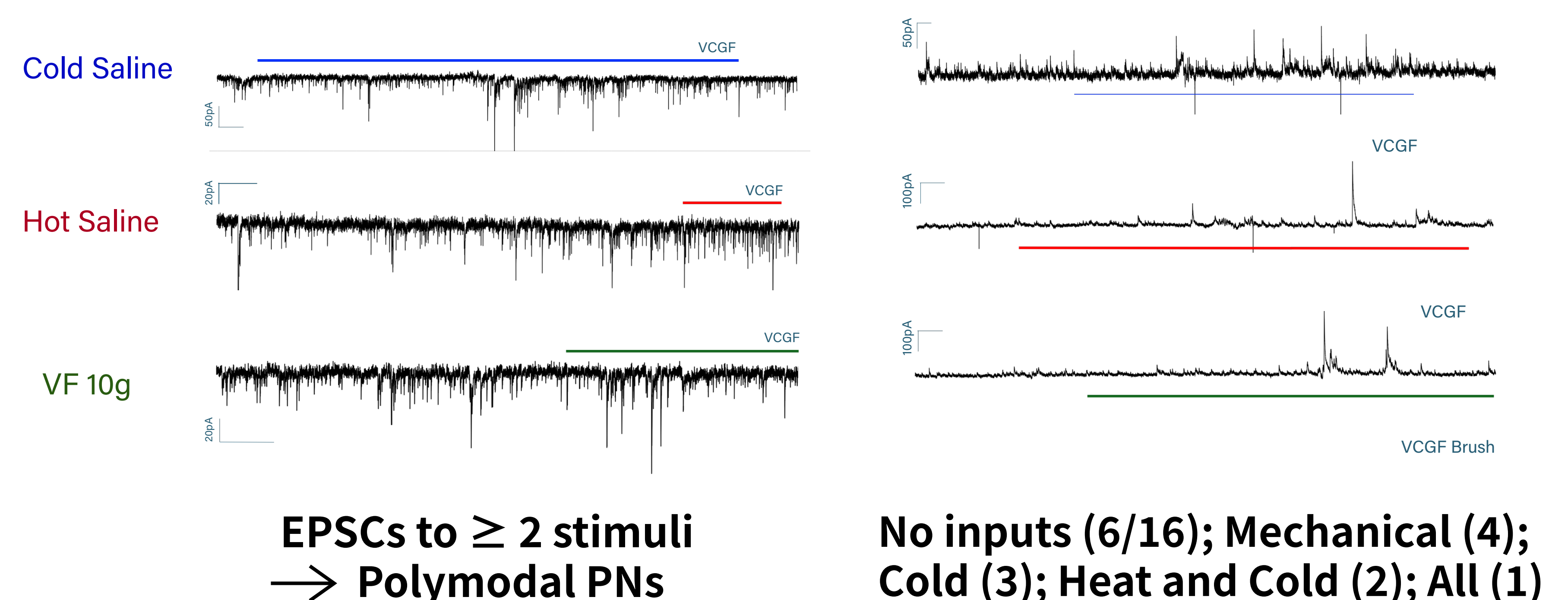
1. Cold-selective PNs received no inhibitory inputs (18/19)



2. Mechanical PNs received mechanical inhibitory inputs (8/10)



3. Polymodal PNs received diverse inhibitory inputs



Conclusion: Inhibitory inputs correlates with PNs' response profiles

