

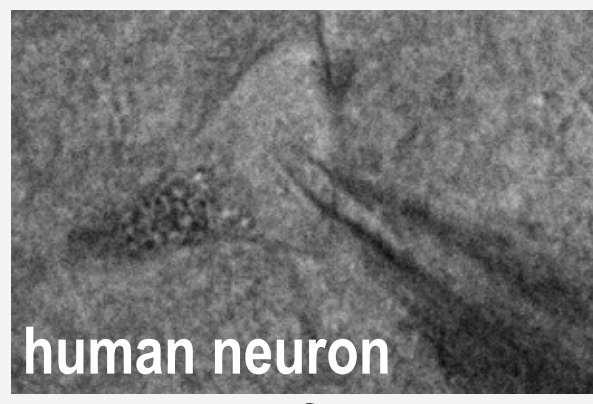
Introduction

- Extraction of meaningful information from our surroundings relies on the functional interaction between two reciprocally connected brain regions - **Hippocampus and Entorhinal Cortex (EC)**.
- In the brain, hippocampus is the seat of learning and memory, while the entorhinal cortex is a hub of sensory information processing.
- This cortico-hippocampal circuit has been extensively studied in rodents but little is known about its architecture and function in the human brain.
- There are differences in single neuron computations and circuit architecture between rodents and humans.
- Since the cortico-hippocampal circuit is central to the pathophysiology of several neurological diseases including epilepsy and Alzheimer's disease, *it is imperative to elucidate its circuit architecture and computations in the human brain.*

Aim

Mapping human cortico-hippocampal circuit

A. Neuronal intrinsic electrical properties



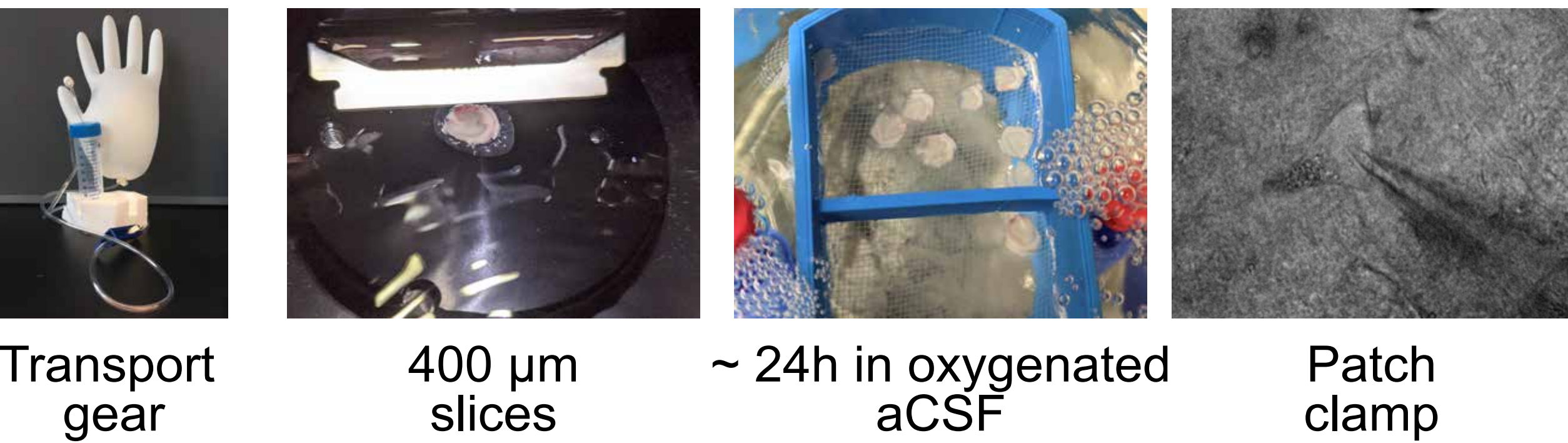
- Firing threshold
- Firing frequency
- Rheobase
- Membrane resistance

B. Network connection and output



- Cortico-hippocampal circuit output
- Excitation/Inhibition balance

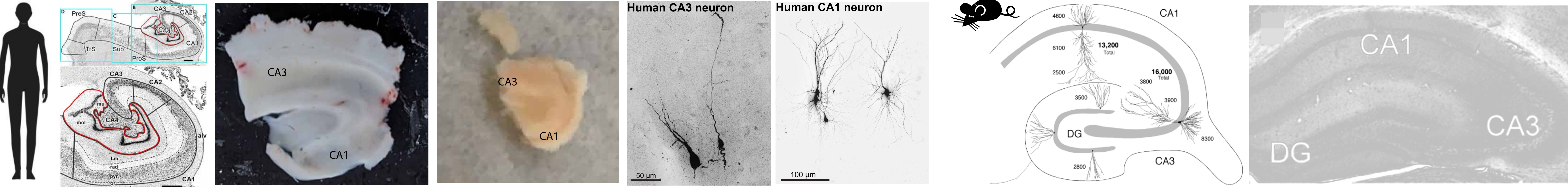
Workflow



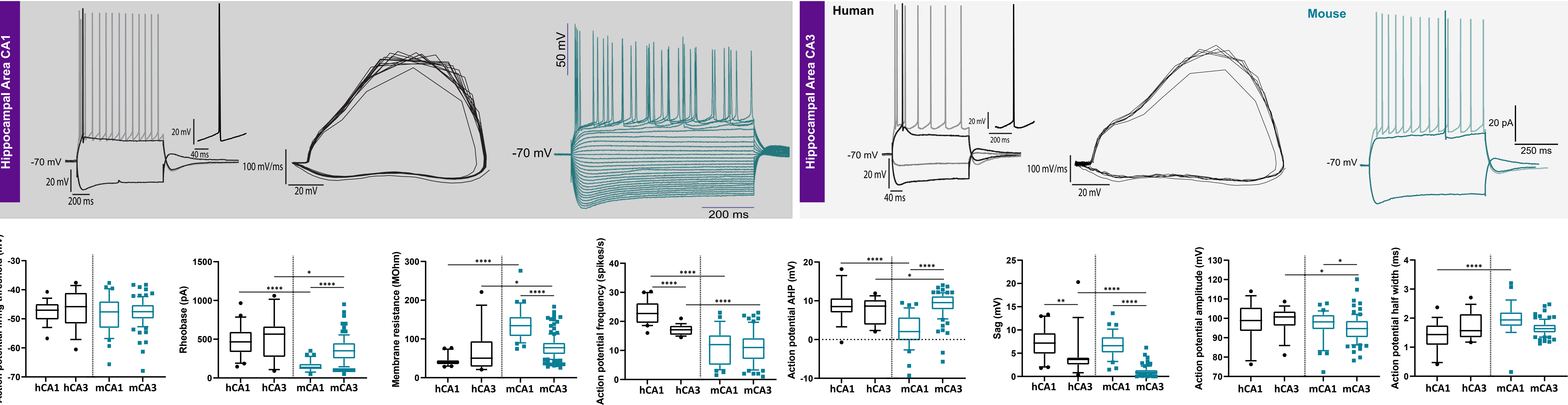
Acknowledgment

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Leon Levy Foundation Fellowship, Leon Levy Foundation
Mathers Foundation Award, Mathers Charitable Foundation
Klingenstein-Simons Fellowship Award in Neuroscience, The Esther A. & Joseph Klingenstein Fund
Sloan Research Fellowship, Alfred P. Sloan Foundation
Whitehall Three Year Research Grant, Whitehall Foundation
Whitehead Fellowship for Junior Faculty in Biomedical and Biological Sciences, New York University
Young Investigator Research Grant, Blas Frangione Foundation
McKnight Scholar Award

Tissue Sample



Intrinsic Electrical Properties



Evoked Responses

