All figures saved using 300DPI, vectorized format svg

**Task Updates:**

remove second Y-axis on figures

Stop x-axis when y reaches 100%

Inflection points matter

Its either inhibition or inhibitory neuron population presence - Look at both

plot regression line on top of 2C -> Error with plotting prevents this?

We want a plot of activation by varying axonal direction to electrode.

Axonal distances should be the same

bin in 45 degree chunks (center on angle -22.5 to 22.5deg)

-opto plot for axon direction

-Do inflection point plots for opto and ICIMS



**Figure 2a.** Neuron Activation: ICMS & Optogenetics

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**Figure 2b.** ICMS effects on each finger pad.

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**Figure 2c:** Neuron RB vs Distance to stimulus (ICMS)

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**Figure 3:** ICMS effects on axon direction (axons located towards the stimulation point enable faster activation of cells)

This figure plots the activation of neurons by varying axonal direction to the central electrode. First, neurons are binned into 45 degree chunks for a total of 4 groups. Next, neurons between groups are organized and paired by their distance to the electrode. Neurons within the groups must be within 5um of the neuron in the first group to meet “closeness” criteria. This allows us to analyze activation by axon direction while keeping distance to electrode somewhat equal. A total of ~200 neurons (50 groups) meet the criteria within a population of 2000 neurons.

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**Figure 3b:** Same analysis but for optogenetics. Similar relationship is found.

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**Figure 4:** ICMS effects motion vs. non-motion tuned



**Figure 5:** ICMS and opto effects on excitatory vs. inhibitory cells

**Extra Figures**

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Difference between activation of neurons with angles 135-180 and angles 0-45 to the center electrode.

**INSER FIGURE**

**Figure:** Distribution of neuron distances





**Figure:** All neurons angle to electrode distribution



**Figure:** Distribution of neuron-electrode distance by bin

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**Inflection point test 1:** ICMS Pad activation when inhibitory neurons are removed



**Inflection point test 2:** Optogenetic Pad activation when inhibitory interactions are removed

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**Figure:** Optogenetic Pad activation: Normal.



**Inflection point test 1:** Optogenetic Pad activation when inhibitory neurons are removed (Inhibition is intact)



**Inflection point test 2:** Optogenetic Pad activation when inhibitory neurons are removed (Inhibition is removed)