

Methodological approaches to recording neuronal activity

(emphasis on high fidelity methods capable of resolving signals from individual neurons)

Electrical Methods for single neurons

- Two electrode methods

 - Hodgkin Huxley

- Microelectrode-based approaches

 - Glass electrodes

 - Sharp microelectrodes

 - Patch pipettes

 - Whole cell recording

 - Cell free patch clamp

 - Extracellular recordings

- Metal electrodes

 - Pt/Ir alloys, Tungsten, Gold plating, coatings

- Tetrodes

 - A bit about spike sorting

- Multielectrode arrays

 - Utah array, Si-fabricated probes, Neuropixel probes

Optical methods for single neurons and populations of neurons

- Small molecule Ca^{++} indicator dyes

- GECIs (**G**enetically-**E**ncoded **C**alcium **I**ndicators)

 - GCaMPs, RCaMPs

- Small molecule Voltage dyes

- Genetically-encoded voltage indicators

Discussion of pros and cons of different methods

References:

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