DePaul Faculty Teaching & Learning Conference

Research as a Teaching Tool

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Giant Squid Axon

- Brain
- 1st-level neuron
- 2nd-level neuron
- 3rd-level neuron
- Stellate ganglion
- Presynaptic (2nd level)
- Postsynaptic (3rd level)
- Giant axon
- Stellate nerve
- Smaller axons

Squid giant axon = 800 μm diameter
- Mammalian axon = 2 μm diameter
Hodgkin & Huxley
Nobel Prize - 1963

Huxley

Hodgkin
Box 3A  The Voltage Clamp Technique

1. One internal electrode measures membrane potential ($V_m$) and is connected to the voltage clamp amplifier.

2. Voltage clamp amplifier compares membrane potential to the desired (command) potential.

3. When $V_m$ is different from the command potential, the clamp amplifier injects current into the axon through a second electrode. This feedback arrangement causes the membrane potential to become the same as the command potential.

4. The current flowing back into the axon, and thus across its membrane, can be measured here.
Figure 5.4  Loewi's experiment demonstrating chemical neurotransmission (Part 1)

(A) Stimulate

Vagus nerve

Solution transferred to heart 2

Heart 1

Heart 2

Acetylcholine

Nobel Prize 1936

Loewi-

NEUROSCIENCE, Fourth Edition, Figure 5.4 (Part 1)
Brief Communications

Diminutive Digits Discern Delicate Details: Fingertip Size and the Sex Difference in Tactile Spatial Acuity

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Fingertip size not gender predicts tactile perception

Peters et al. 2009