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Slide of the Seminar

Neurophysiology of the leeches a model organism for studying neuronal base of behavior

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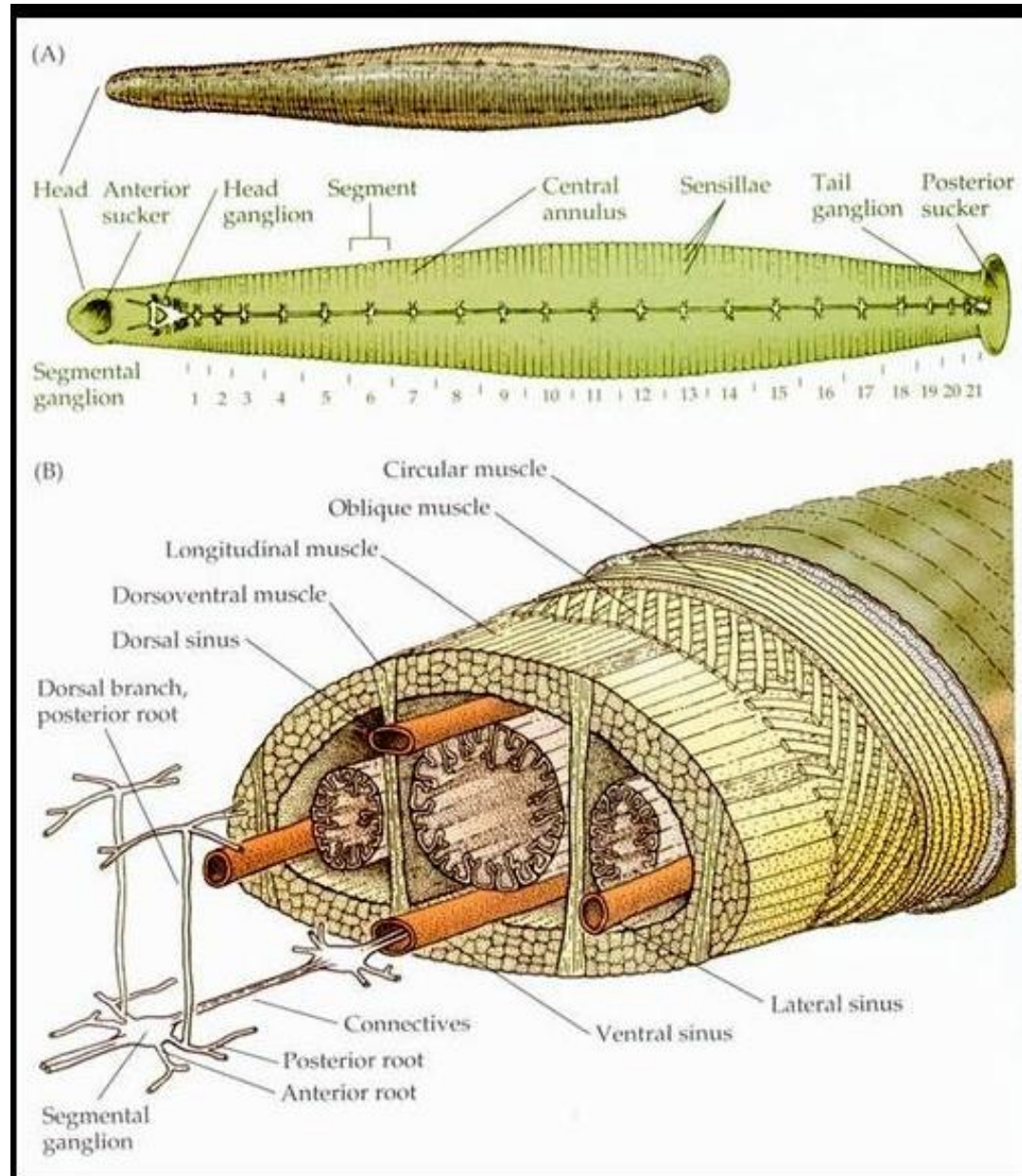
**Neurophysiology of the leech as a model
organism for studying neuronal base of
behavior.**

Giulietta Pinato, SISSA, Trieste, Italy

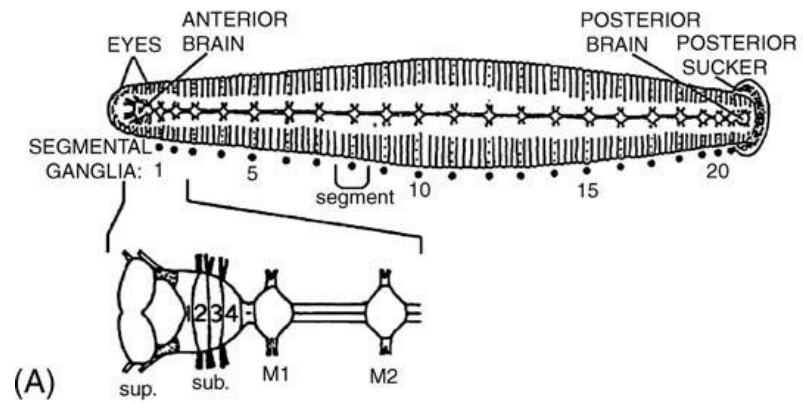


1 cm

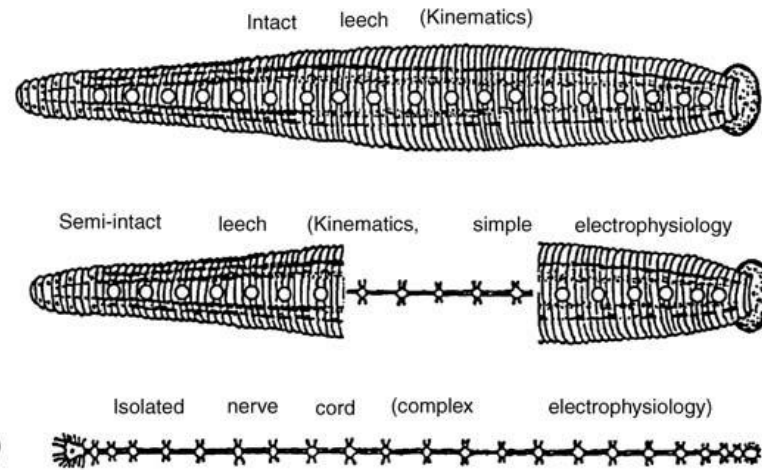
Hirudo Medicinalis



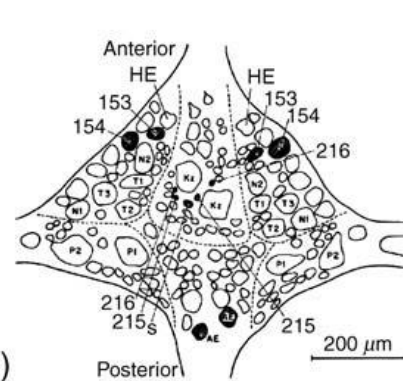
Nicholls and Kuffler (1976)
From neuron to Brain



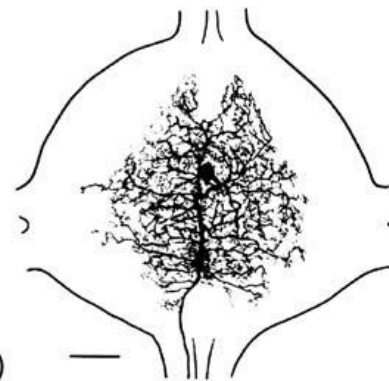
(A)



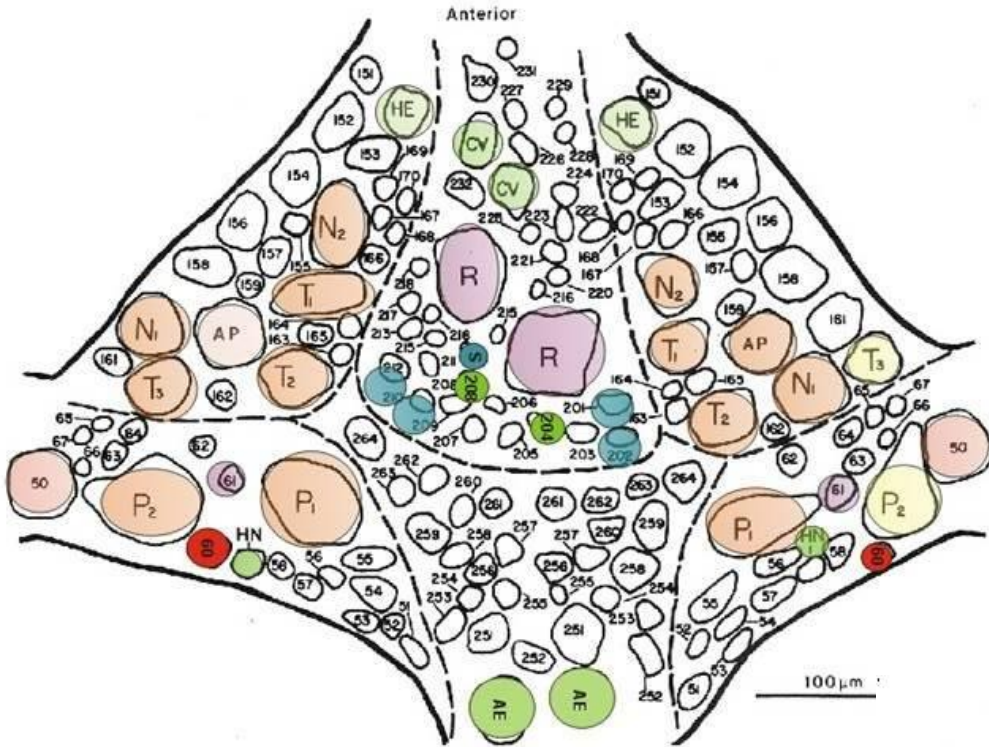
(B)



(C)



(D)

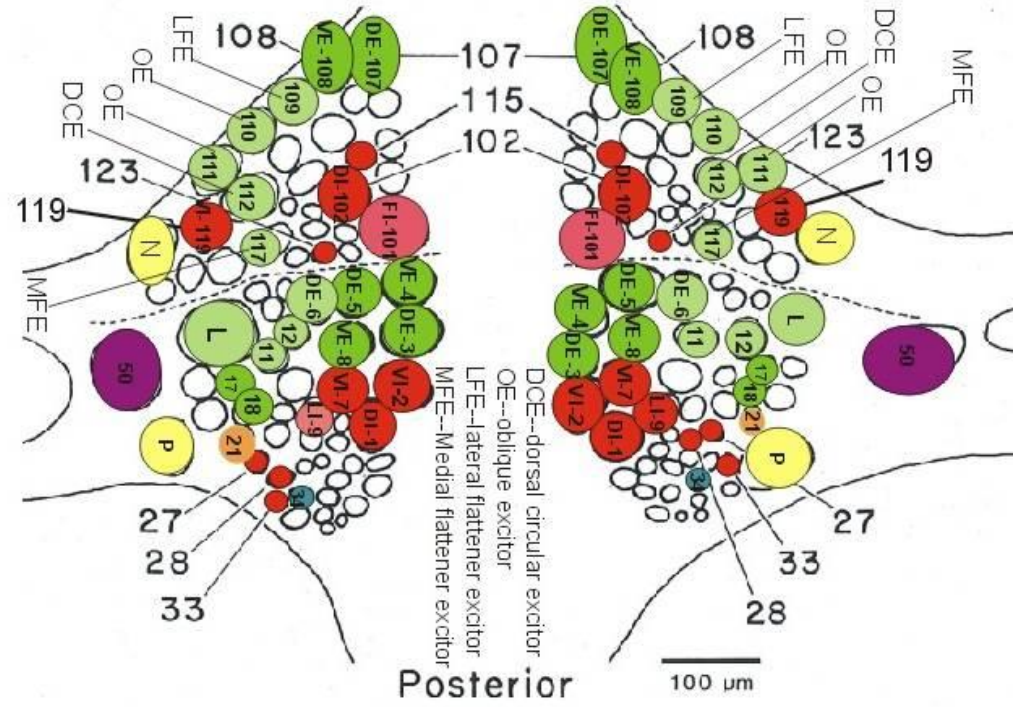


← **Ventral view**

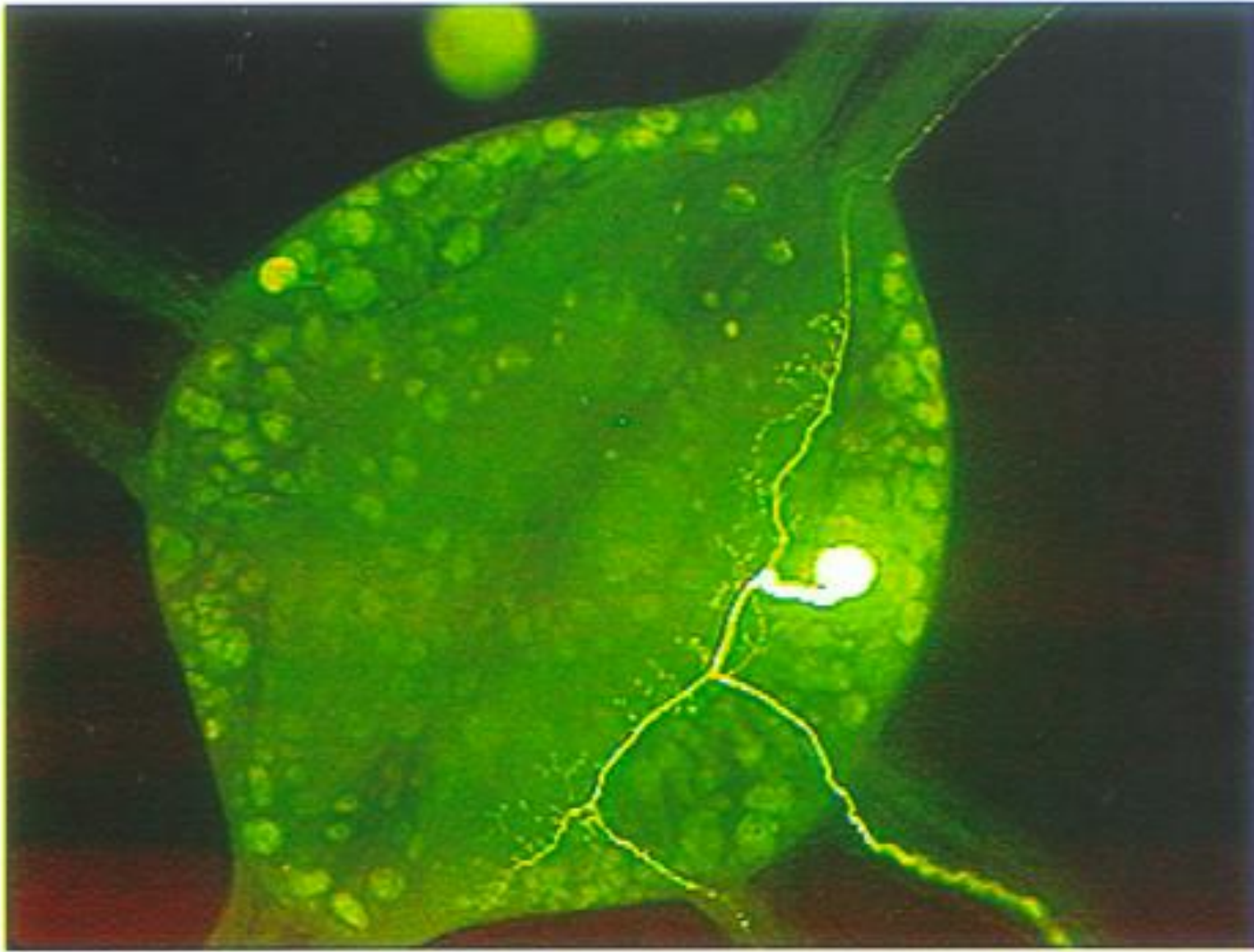
- Sensory neurons (mechanosensory)
- Interneurons

Dorsal view →

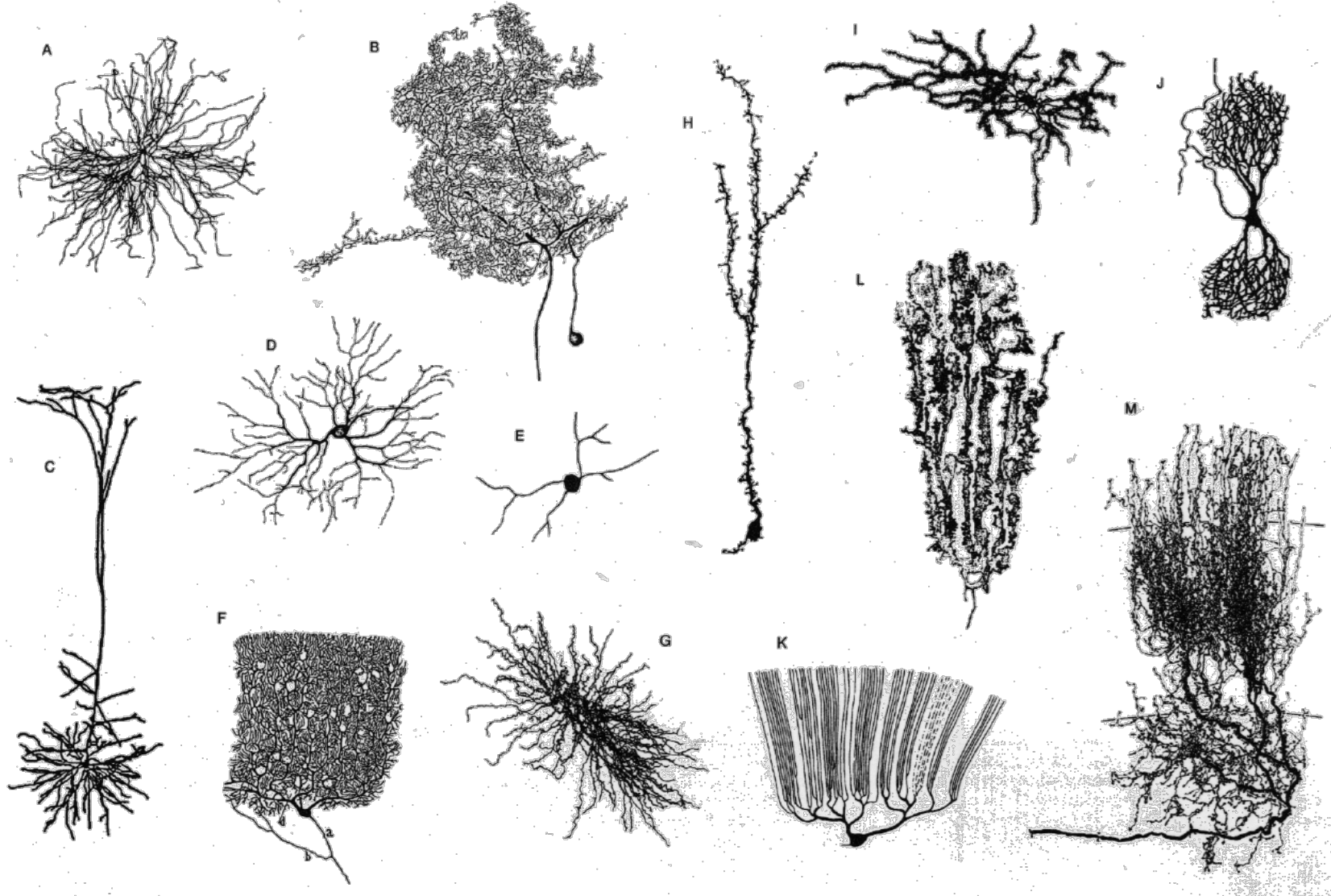
- Motor neurons



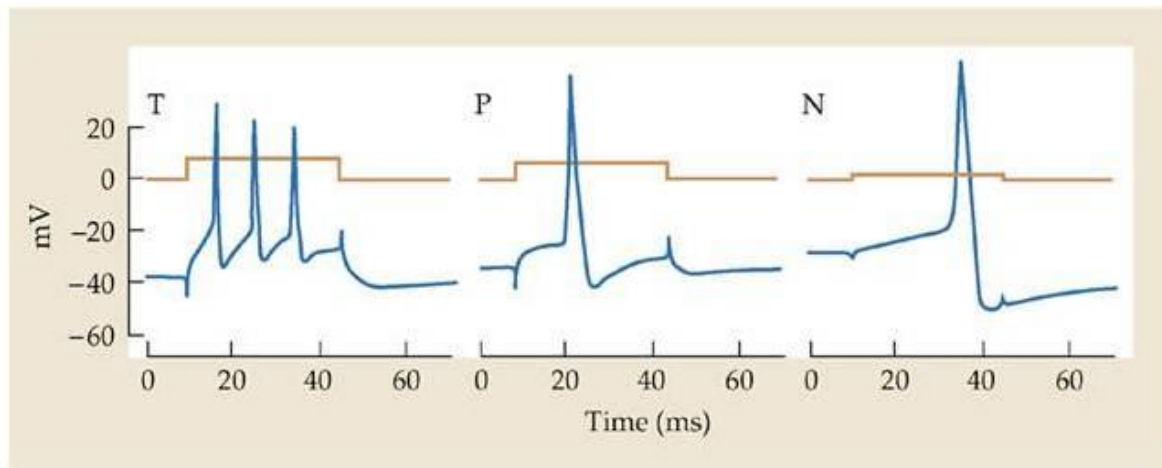
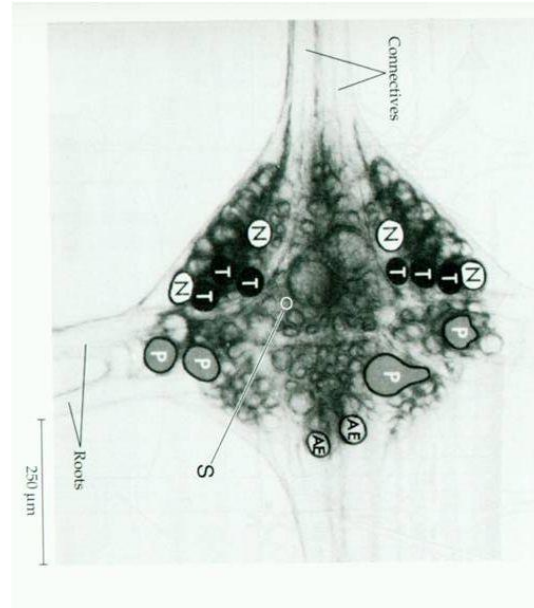
Morphology

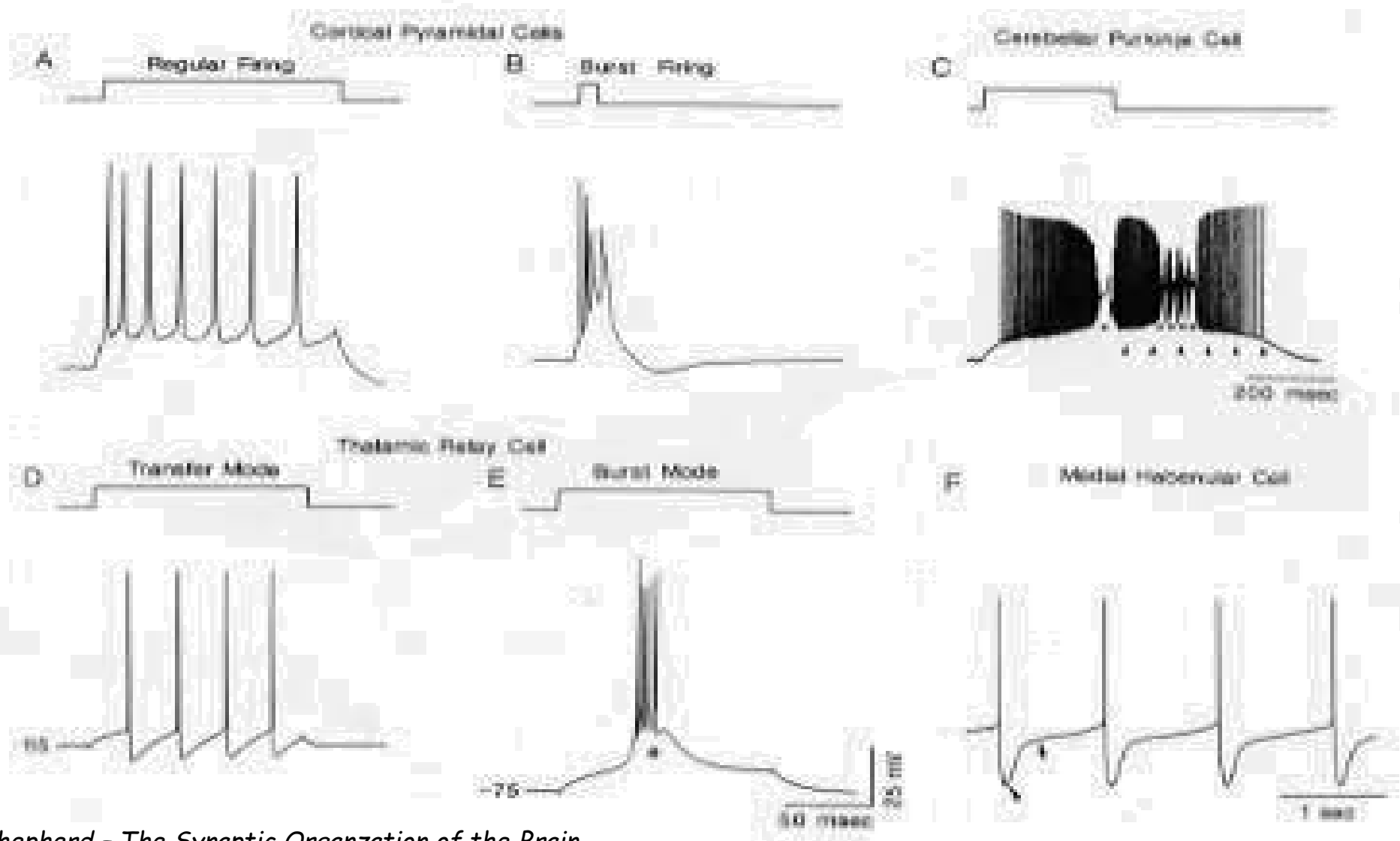


100 um



Electrophysiology



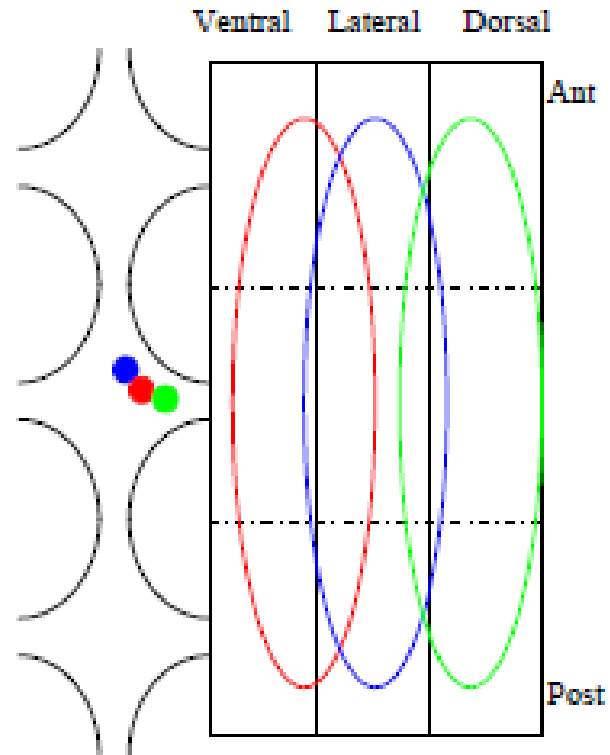


Shepherd - The Synaptic Organization of the Brain

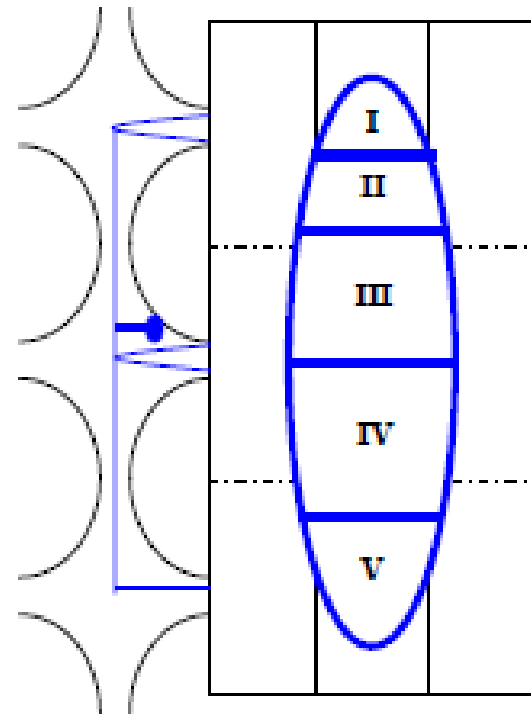
Characterization of receptive fields

Region of the sensory space that triggers a response in the sensory neuron

A

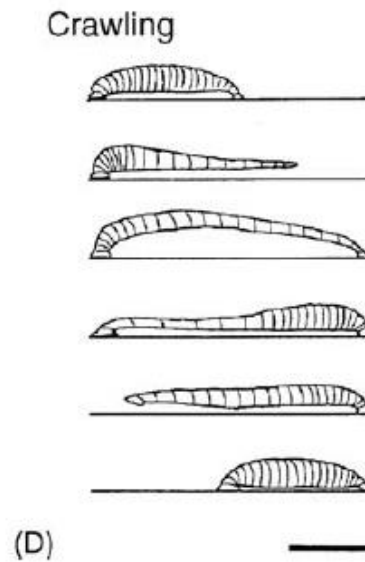
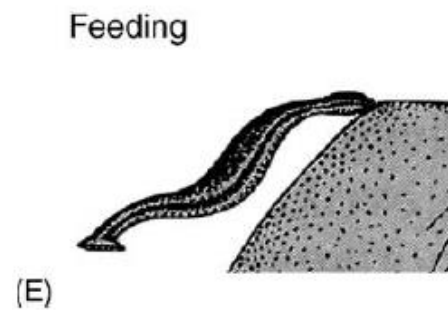
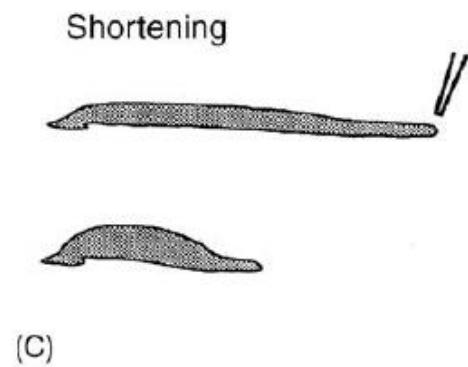
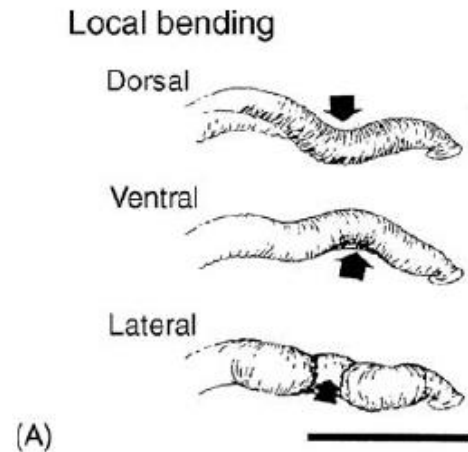


B



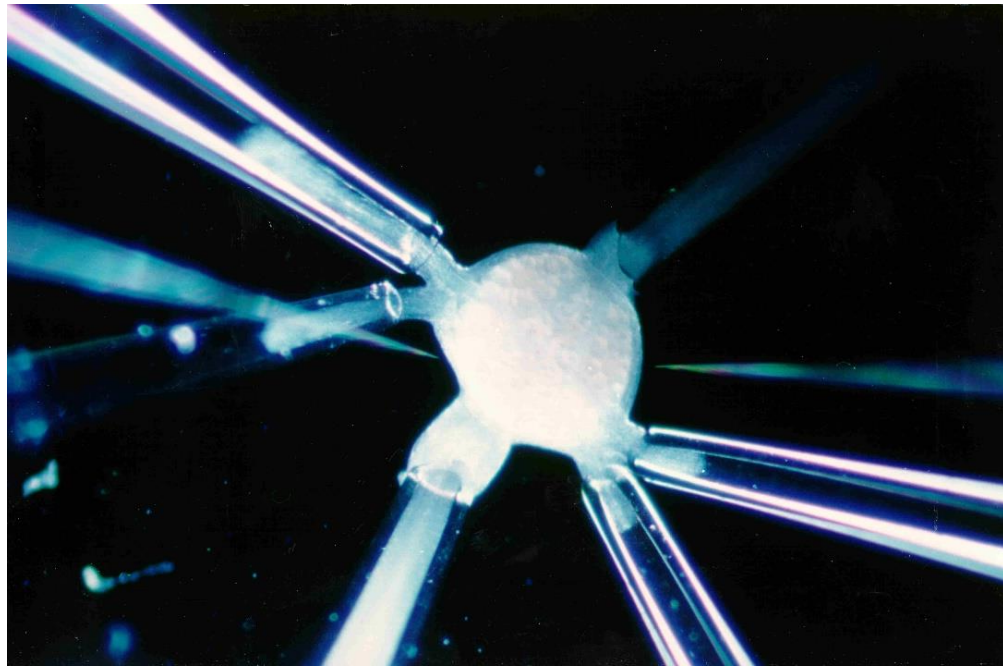
Neuronal basis of stereotyped behaviors in the leech

W.B. Kristan Jr. et al./Progress i



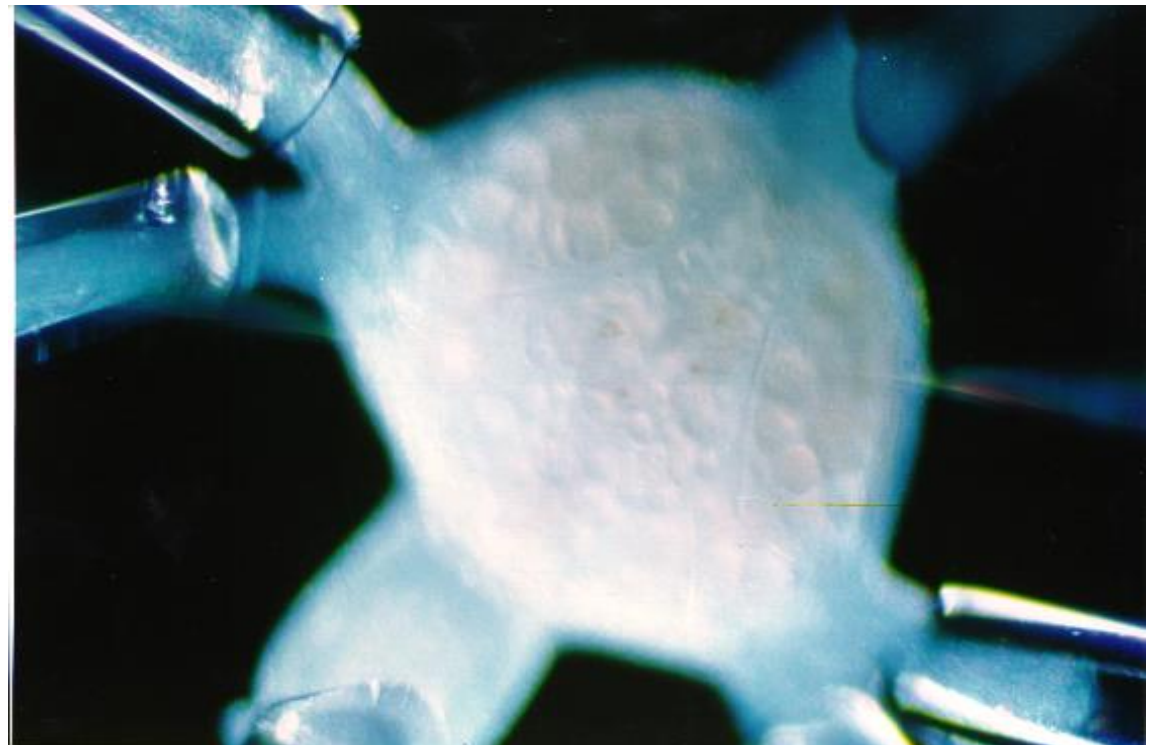
Techniques to collect experimental data on neuronal activity in the leech

- Electrophysiological recordings (extracellular, intracellular)
- Optical recordings (voltage sensitive dyes, Ca²⁺ dyes)



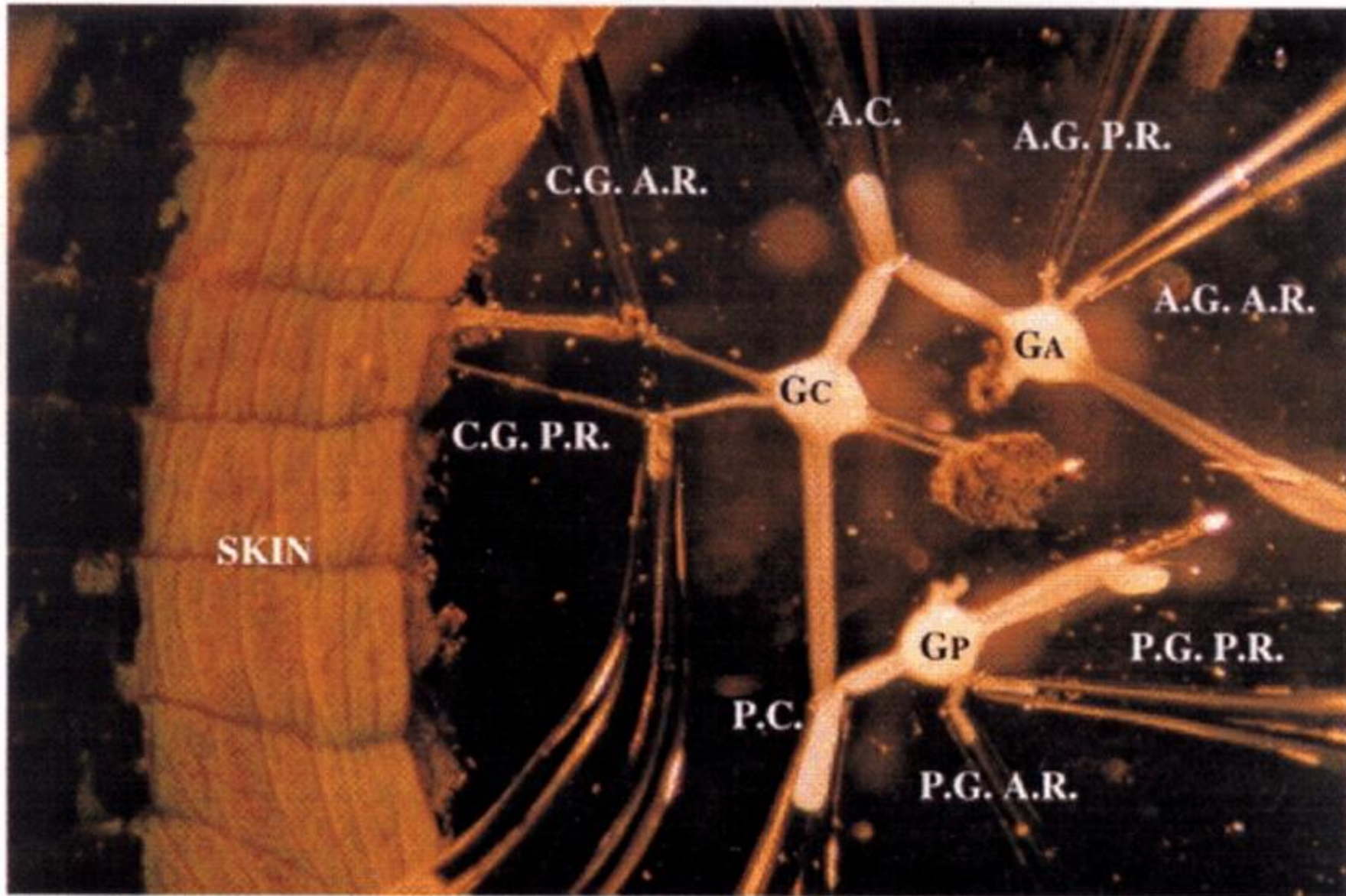
Intracellular + extracellular recordings

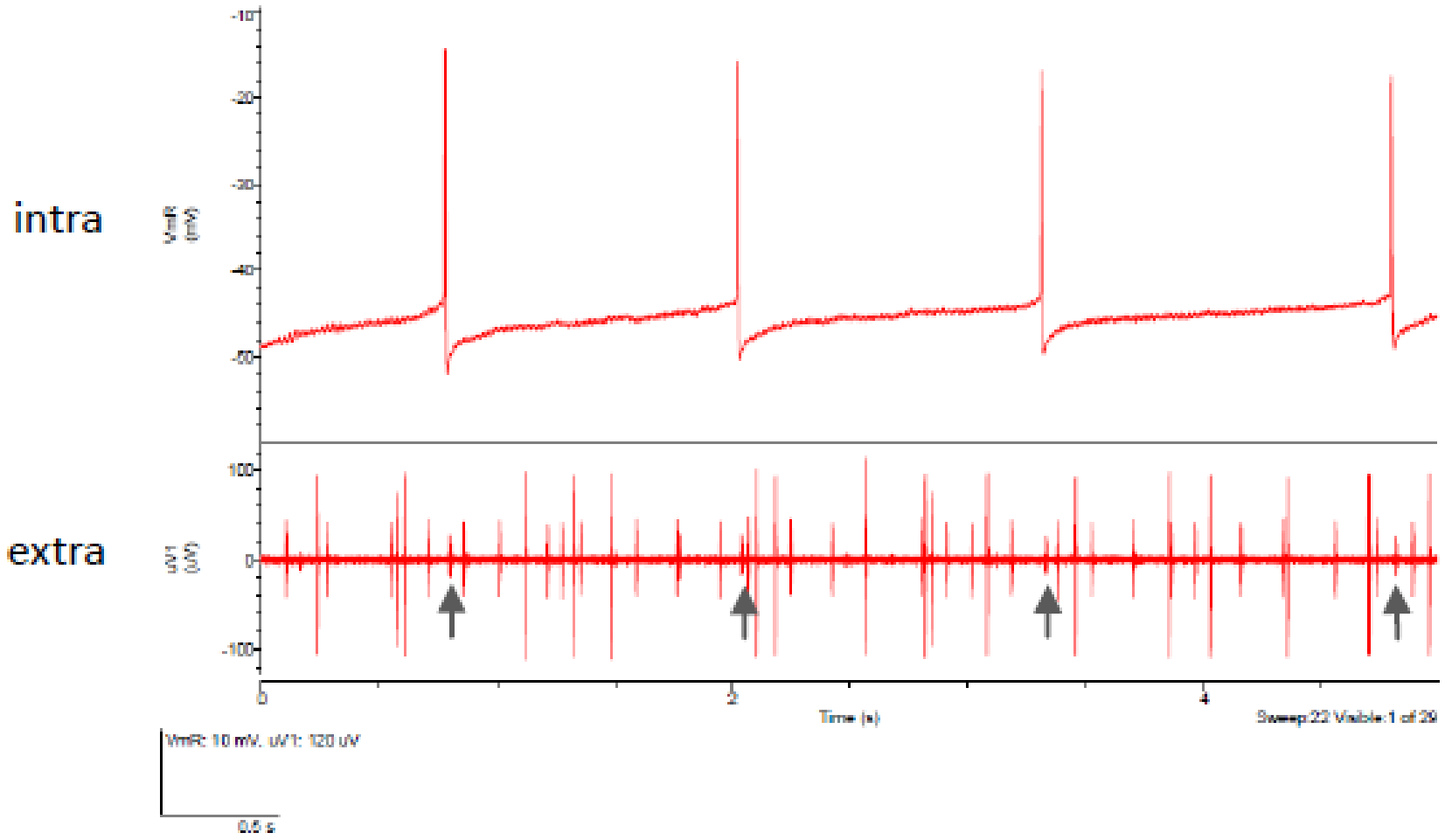
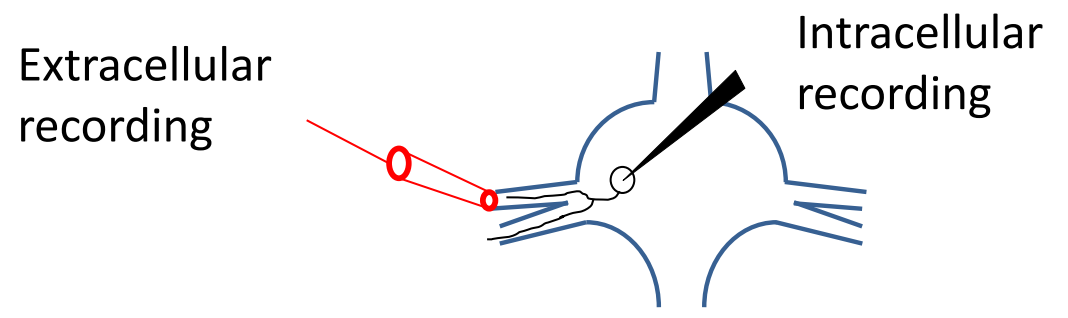
500 μm

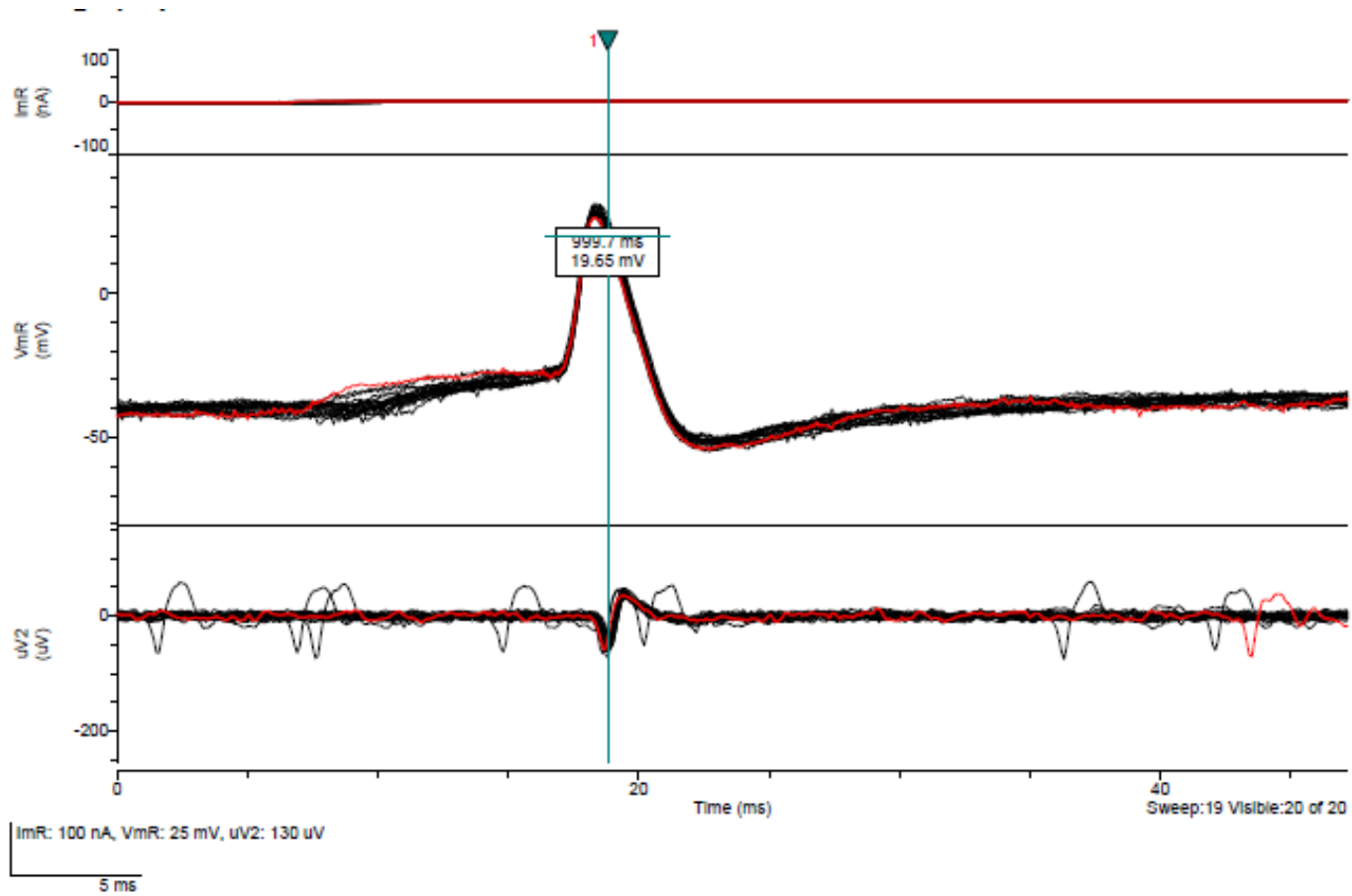


250 μm

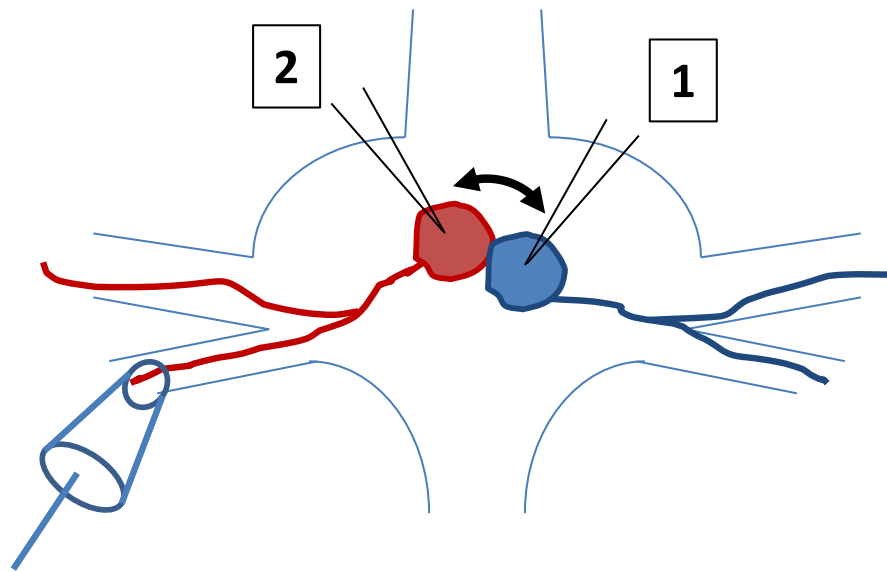
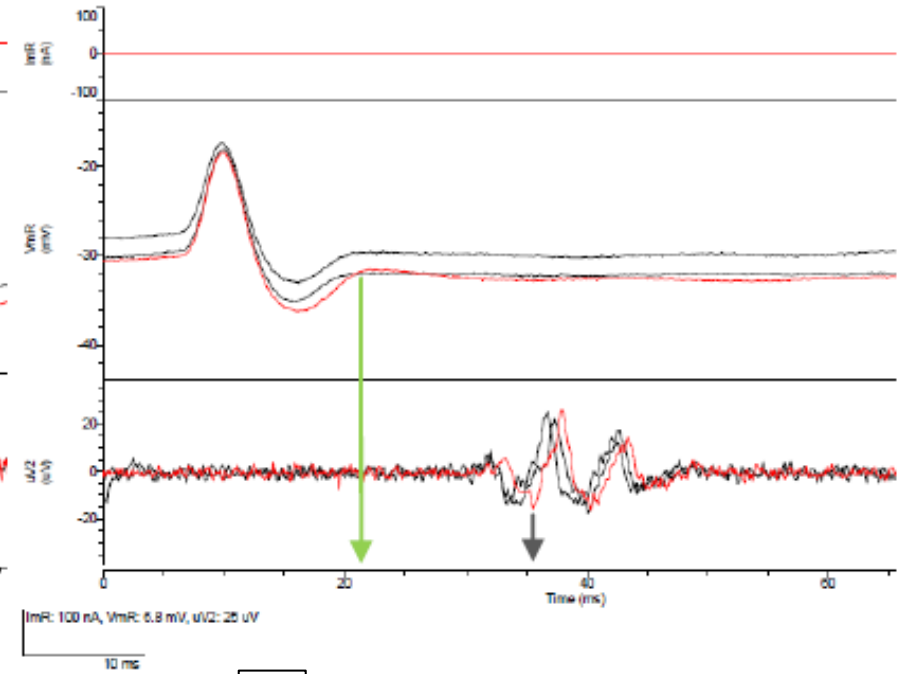
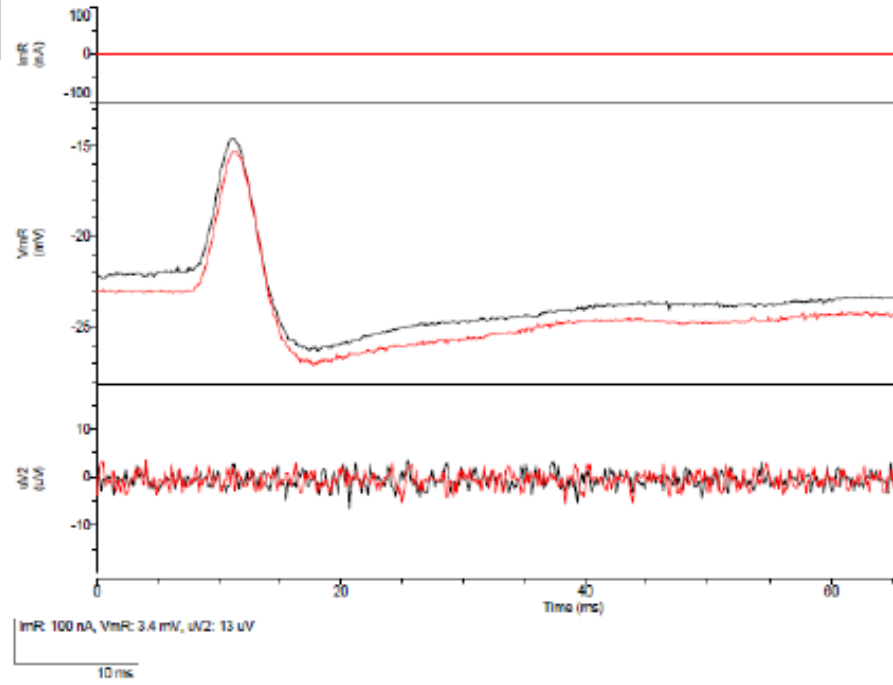
Semintact preparations for testing sensory modalities and motor output



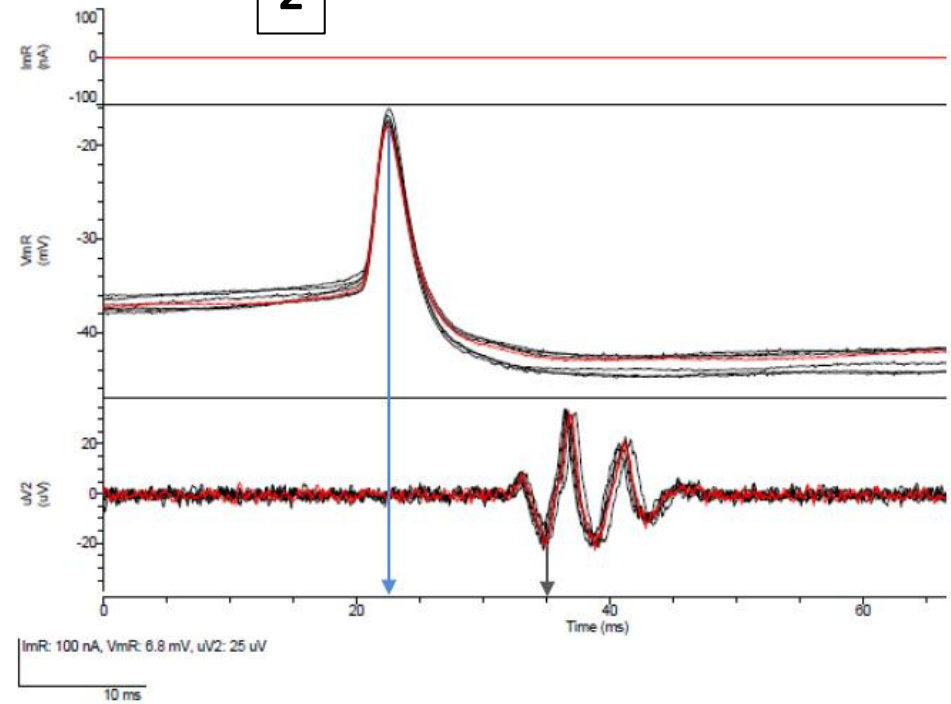


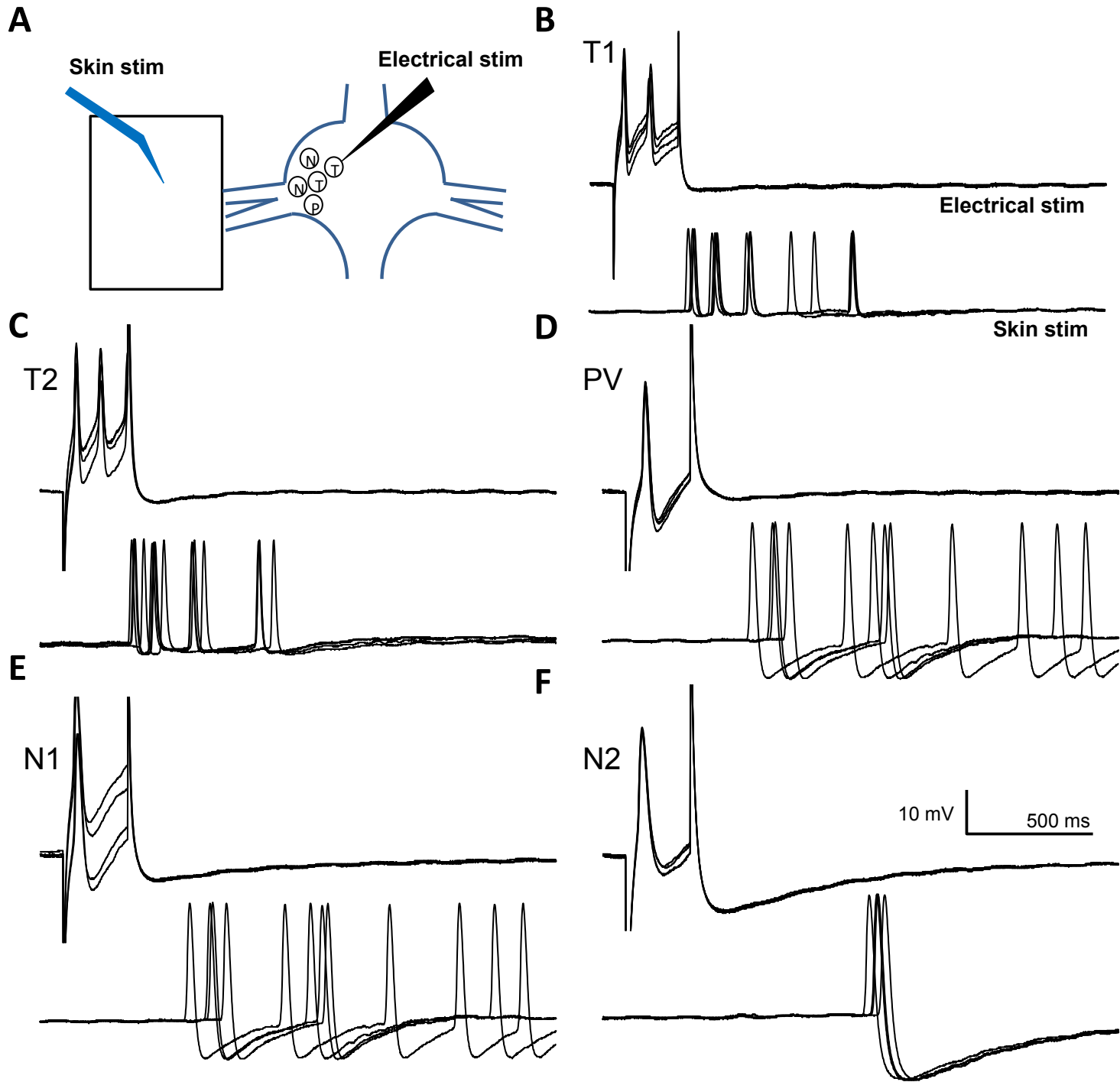


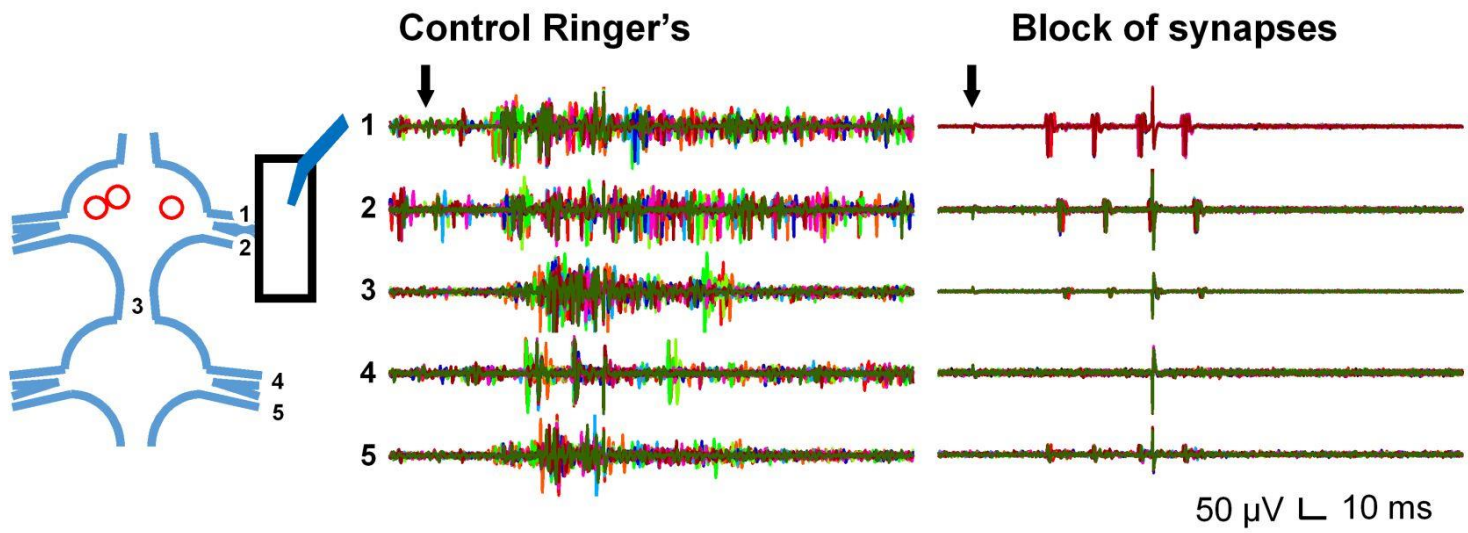
1

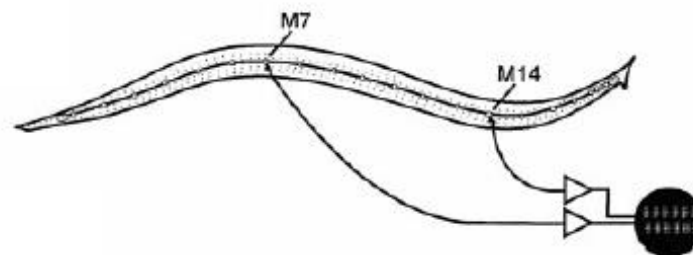
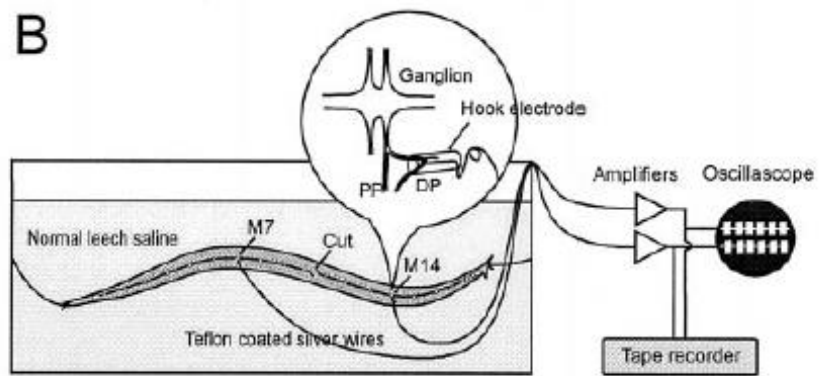
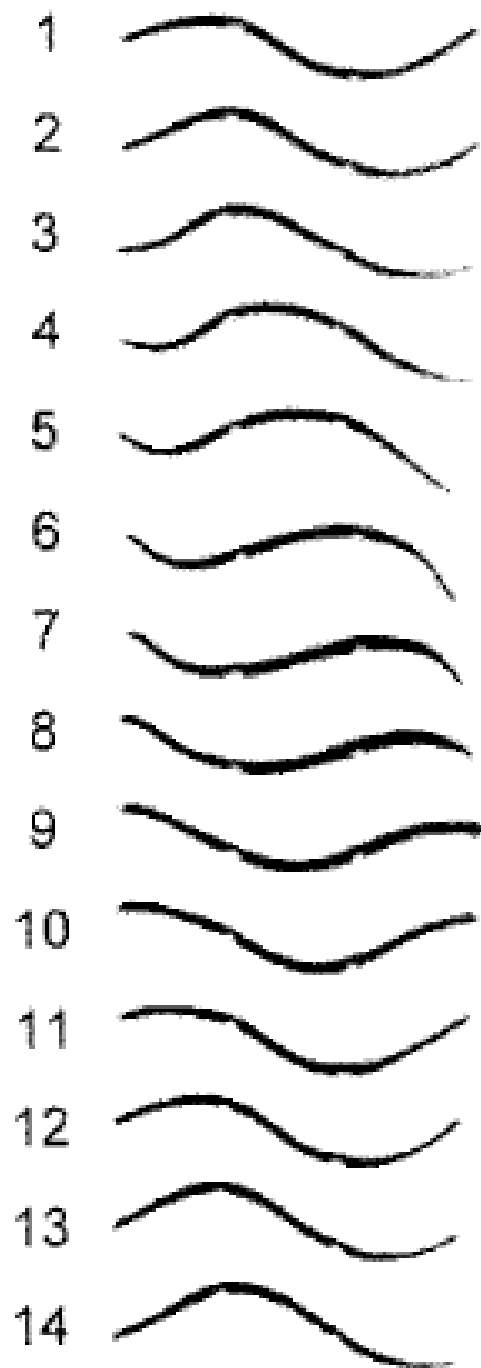


2









1 s

