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INTRACELLULAR AND PATCH-CLAMP RECORDING IN THE NEMATODE *C. ELEGANS*. S. R. Lockery*, C. M. Loer and T. J. Sejnowski. Computational Neurobiology Lab., Salk Institute, La Jolla, CA 92186.

Although a complete anatomical circuit is available for the nematode *C. elegans*, further progress in understanding the neuronal basis of behavior has been hampered by the inability to make electrophysiological recordings. Using quartz sharp electrodes and conventional patch pipettes, we explored the feasibility of recording from identified muscles and neurons in *C. elegans*. Worms were affixed to coverslips, maintained in Ascaris saline, and observed using an inverted microscope with Nomarski optics. Quartz electrodes driven through the cuticle lost 50% of their initial resistance but remained sharp. Dye fills (Lucifer Yellow) of a number of cells were obtained including an amphid sheath cell, individual body muscles, and pharyngeal muscle cells. In some preparations, pharyngeal muscles were dye coupled, while in others they were not. Pharyngeal contractions could sometimes be produced by passing depolarizing current. To facilitate patch recording, cells were exposed by making a slit in the cuticle over the nerve ring. Cells were judged to be neurons on the basis of size, appearance of the nucleus, and presence of one or two processes. As previously shown by D. Raizen and L. Avery (personal communication), gigaohm seals (5-20 G) could readily be formed and single channel currents observed. Seals were stable and lasted over an hour. Thus, it is likely that sharp electrodes can be used to record from muscles and whole-cell recordings can be used to study the intrinsic properties of neurons in *C. elegans*.

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