

Neural Prosthesis Seminar

**“Restoration of Sensory and
Motor Function with Penetrating
Microelectrode Arrays”**

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Biomedical Research Building • BRB 105

Case Western Reserve University



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Abstract:

Work is ongoing at the University of Utah on the development of various neuroprosthetic interventions to disorders of the nervous system based upon microstimulation of the central and peripheral nervous systems using arrays of penetrating microelectrodes. This approach has many advantages over more conventional means of intervening with the nervous system: the small electrode tips enable selective recording of neural activity from individual neurons or small groups of neurons and selective stimulation of small populations of neurons from cerebral cortex and/or fibers in peripheral nerves and the currents required to stimulate these small neuronal populations are smaller than with extraneural approaches. The small size of individual electrodes permit many electrodes to be built on a single array so one implanted electrode array can selectively activate small populations of motor units in a large number of muscles. This feature, combined with asynchronous microstimulation of electrodes allows for the production of fatigue resistant muscle forces. Potential applications of microstimulation and recording via penetrating microelectrode arrays that will be discussed are: sight restoration by microstimulation of visual cortex; production of stance in anesthetized cats; use of recordings of peripheral nerve to control prosthetic limbs; and selective microstimulation of pudendal nerve fibers for control of micturition.

For more information, please contact Cathy Walker at (216) 707-6490.

Live stream video link for each lecture at www.FEScenter.org/Seminar