

## Neural Prosthesis Seminar

# “Stimulating neurons with light: current state and future challenges”

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Biomedical Research Building • BRB 105

Case Western Reserve University



E. Duco Jansen, Ph.D.

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#### Abstract:

A novel method that employs infrared laser pulses to induce electrical activity (EP/AP) in neurons will be presented. This method has been shown to have several fundamental advantages over traditional electrical stimulation, including the spatial precision of stimulation that can be achieved in a non-contact fashion, and the lack of a stimulation artifact on the recording electrodes in classic stimulation-recording experiments. In this seminar I will present an overview of the concepts and applications of optical nerve stimulation. Characterization of optical stimulation and physiological validation will be shown. The underlying biophysical mechanisms of optical stimulations appear to be thermally mediated. I will present our work on mechanistic studies as well as on the applications in the peripheral nervous system (stimulation of motor neurons and stimulation of sensory nerves in the cochlea), stimulation in the CNS, and the development of a stand-alone optical nerve stimulator.

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