Engineering Neuroscience & Health

Department of Biomedical Engineering Division of Biokinesiology and Physical Therapy

ENH SEMINAR SERIES

Presents:

Dr. Leonardo Cohen

National Institute of Neurological Disorders and Strokes

Monday

January 25, 2010

4:00 p.m.

Refreshments will be served 3—4 pm

"Investigating neural substrates of motor learning with noninvasive cortical stimulation"

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Procedural learning has been extensively studied using the serial reaction-time task (SRTT). In this test, subjects are instructed to respond to visual cues by pressing different keys on a keyboard. The order of key presses repeats a predetermined sequence, typically without the subjects' knowledge. The result is that the response time in the learning hand shortens even when the subject remains unaware of the existence of a repeating sequence. Learning of motor sequences may differ depending on the training schedule and seem to transfer from a training to an untrained hand.

Investigation on the neural substrates underlying these different learning processes can be accomplished using noninvasive cortical stimulation. In this way it is possible to investigate the effects of stimulation of particular brain regions on learning processes by either facilitating such activity or down regulating it. Additionally, combination of neuroimaging with brain stimulation techniques can provide deeper insights. Recent work in my laboratory exploring the mechanisms underlying motor skill learning, particularly motor sequences, will be presented. The tasks that will be discussed include: serial reaction time task1-3, a sequential force generation task4, and evaluation of the role of different brain regions on acquisition of a sequential skill through different training schedules5. Overall, noninvasive stimulation of different brain areas provided novel information on the role of interhemispheric interactions between both primary motor cortices, intracortical mechanisms within the primary motor cortex of each hemisphere and on the contributions of the supplementary motor area.

Locations:
Seminar is simultaneously presented

UPC: HNB 100 — LIVE
Hedco Neurosciences Building
UPC Campus Map/Directions:
http://www.usc.edu/about/visit/upc/

HSC: CHP 147 – Video Conference
Center for the Health Professional
HSC Campus Map/Directions:
http://www.usc.edu/about/visit/hsc/

Organized by Professor Francisco Valero-Cuevas http://bme.usc.edu/valero/

Web Cast
http://capture.usc.edu/college/Catalog/pages/catalog.aspx?catalogId=946350f1-ca84-40e7-b867-e16adba01e4e

Information about all seminars can be found at
http://bme.usc.edu/valero/ENH/ENH-Schedule.html