

Department of Biomedical Sciences  
presents a departmental seminar



# “Changes in properties of identified spinal neurons after spinal cord injury”

**Prof. Ronald M. Harris-Warrick**  
**Cornell University**

**Date :** ~~14 March 2017~~ **15 March 2017**

**Time:** ~~3:30 pm to 5:00 pm~~ **11am to 12:30pm**

**Venue:** ~~2-130, 1/F, Block 2, To Yuen Building, City University of Hong Kong~~  
**B6605, 6/F, Academic 1, City University of Hong Kong**

## Abstract

The neural networks that drive rhythmic locomotor activity, called the locomotor Central Pattern Generator (CPG) are located in the lumbar spinal cord. After most spinal cord injuries (SCI), the CPG component neurons are not themselves damaged, but they lose the normal descending transmitter and modulatory inputs that set their excitability. As a consequence, they undergo homeostatic compensatory changes in an attempt to restore their normal activity. We are studying these homeostatic changes in genetically identified subclasses of spinal neurons. I will discuss changes in excitability, bistability and neuromodulator sensitivity in motoneurons, the ipsilaterally projecting excitatory V2a interneurons, the ipsilaterally projecting inhibitory V1 interneurons, and preliminary data on the V0c cholinergic interneurons. These results show that different classes of interneurons respond in different ways to SCI. I will also show data on changes in the pattern of gene expression in the spinal cord below a spinal transection; we demonstrate changes in the coordination of expression of excitability genes after SCI, suggesting a fundamental change in transcription factor regulation of these neurons. All of these results suggest that after spinal injury, the CPG networks for locomotion undergo plastic changes that may interfere with recovery after injury. Supported by NIH grant NS17323.

## About the speaker

His research group studies the CPG for hindlimb locomotion, located in the lumbar region of the spinal cord in the mouse. They are currently studying three major questions in this system. First, identification of the interneurons that are components of the CPG, and of their synaptic connections, to better understand the organization of the locomotor CPG. Second, modulation by serotonin of the properties and synapses of identified neurons in the mouse spinal locomotor CPG, to better understand how serotonin can reconfigure the network to prepare it for locomotion. Third, the changes in the intrinsic properties, synaptic interactions, and responses to serotonin of identified interneurons in the mouse locomotor CPG after spinal cord injury (SCI).

After his BS graduation of Stanford University, Prof. Harris-Warrick obtained a Ph.D in 1976 at the Stanford University School of Medicine. He was a NIH postdoctoral fellow at Stanford University in 1976. In 1986, he was an associate professor at Cornell University. He has been a professor in the Department of Neurobiology and Behavior at Cornell University since 1992.

## Contact

Prof. Ying Li (3442-2669, [yingli@cityu.edu.hk](mailto:yingli@cityu.edu.hk))

Miss Janice Leung (3442-4902, [Janice.leung@cityu.edu.hk](mailto:Janice.leung@cityu.edu.hk))

**All are welcome!**