

The origins of neurons, brains & memory: Deciphering convergent evolution at the single-cell resolution

SPEAKER **Leonid L. Moroz**

Distinguished Professor
Neuroscience, Genetics, Biology, and
Chemistry, University of Florida, USA

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TIME 10:30 AM - 11:30 AM

VENUE Y6405, CS Seminar Room, 6/F., Yellow Zone, Yeung Kin Man Academic Building, City University of Hong Kong, Kowloon Tong, Hong Kong

ABSTRACT

How to make a neuron, a synapse, and a neural circuit? Is there only one 'design' for a neural architecture with a universally shared genomic blueprint across species? The brief answer is "No." Neurons evolved more than once. However, complex brains evolved at least 20 times independently. This seminar will discuss neural systems' convergent and parallel evolution using several interdisciplinary approaches, from sequencing aboard oceanic vessels (Ship-Seq) & Single-cell multi-Omic to behaviors. In summary, little-explored examples of convergent neuronal evolution provide conceptually novel microanatomical and physiological architectures of behavioral controls in animals with prospects of neuro-engineering and synthetic biology.

BIOGRAPHY

Dr. Leonid L. Moroz takes advantage of marine biodiversity (>20 phyla) to understand how neurons operate, learn, and remember; how this complexity formed. He reveals that neurons and centralized brains independently evolved from ancestral cell lineages. Using massive single-cell 'omics' together with physiology and advanced imaging, he reconstructs how the descendants of these cell lineages "come together" to form nervous systems of ctenophores or bilaterian brains, including octopuses or humans. Unique floating labs have been developed to sequence marine organisms directly aboard (Ship-Seq) to reconstruct the Genealogy of Neurons and Cell Type Tree of Life. Here, he integrates Planetary Biodiversity and Biomedicine.

All are welcome!



In case of questions, please contact Prof Dapeng Wu at dapengwu@cityu.edu.hk, or visit the CS Departmental Seminar Web at <https://www.cs.cityu.edu.hk/events/cs-seminars/recent-cs-colloquia>.