



Laboratoire de Chémo-Biologie

**Synthétique & Thérapeutique CBST**

UMR 7199

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# CONFERENCE

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*Faculté de Pharmacie*

*Amphi Métais*

## The Cerebellum: the little brain big in computing



### **Prof. TIN Chung**

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Le Prof. Tin sera disponible le jeudi matin et après-midi à la Faculté de Pharmacie, si vous souhaitez le rencontrer envoyez un e-mail à [alexandre.specht@unistra.fr](mailto:alexandre.specht@unistra.fr) ou [frederic.bolze@unistra](mailto:frederic.bolze@unistra)

# The Cerebellum: the little brain big in computing

**Prof. Chung TIN, PhD**

*Department of Biomedical Engineering  
City University of Hong Kong*

The cerebellum, despite its small volume, houses approximately 80% of the neurons in the central nervous system. Traditionally, it has been regarded as a region related to motor function, but recent studies suggest its functionality extends well beyond that. The cerebellum maintains extensive connections with numerous brain regions, either directly or indirectly. One most critical function of the cerebellum is to enable accurate and precise movement which requires precision at scale of millisecond despite delay in sensory feedback through various forms of learning. An important research question for cerebellum has been to elucidate the relationship between its anatomical structure. In this talk, I would like to share the highly interdisciplinary (both in neuroscience and engineering) research work that we have pursued for the cerebellar system. First, I will share our work in uncovering novel signal feedback pathway in the cerebellar neural circuit in the rat and its role in associative learning of delayed eyeblink conditioning. Next, I will discuss the development of a high-speed hardware implementation of the cerebellar computational model and present our experimental result of a real-time neuroprosthetic system for restoring cerebellum-dependent motor learning. Last, I will share some work on signal processing tools for processing the neural related signal to facilitate the work of neuroscientists.

## ***Biography:***

Chung Tin is currently an Associate Professor in Department of Biomedical Engineering at City University of Hong Kong. He received his BEng. degree (1st Class) from University of Hong Kong in Mechanical Engineering in 2002. He then moved to the United States and obtained his S.M. and PhD. degrees, both in Mechanical Engineering, from Massachusetts Institute of Technology, in 2004 and 2011, respectively. He continues as a postdoctoral associate in MIT until he returned to Hong Kong in 2012. He has been awarded Croucher Foundation Scholarship (HK), American Heart Association Predoctoral Fellowship, and Early Career Award (Research Grant Council, Hong Kong). His research interests include sensorimotor learning, neural computing, machine learning and neuromodulation.