



# Centre de Neurosciences Psychiatriques

## CNP SEMINAR

### ANNOUNCEMENT

Monday June 17<sup>th</sup>, 2024, 11:00 to 12:00 am

## Transcriptional dynamics orchestrating neuronal differentiation in the adult hippocampus

By : Prof. Alejandro Schinder

Laboratorio de Plasticidad Neuronal, Fundacion Instituto Leloir-.IIBBA CONICET Buenos Aires.-. Argentina

### **Summary**

The adult hippocampus generates new granule cells (aGCs) with functional capabilities that convey unique forms of plasticity to the preexisting circuits. While early differentiation of adult radial glia-like neural stem cells (RGL) has been studied extensively, the molecular mechanisms guiding the maturation and functional integration of postmitotic neurons has remained unknown. Using single-nuclei RNA sequencing (snRNA-seq), we interrogated aGC differentiation and found multiple immature stages bearing increasing levels of effector genes supporting growth, excitability and synaptogenesis. We have also unveiled molecular features defining four distinct cellular states in the pathway to neurogenesis. Becoming a mature neuron involves transcriptional switches that shutdown pathways promoting cell growth, to activate programs that likely control neuronal homeostasis. In my talk, I will discuss these molecular features in the context of neuronal development, integration, and function.

**Invited by :** [Nicolas.toni@chuv.ch](mailto:Nicolas.toni@chuv.ch)

### **Short Bio :**

Alejandro Schinder is Principal Investigator at the Argentine Research Council (CONICET). His lab at the Leloir Institute investigates mechanisms of plasticity in the mammalian brain, focusing on circuit remodeling by adult-born neurons, their regulation by experience, and their functional implications. He obtained his degree in Biology at the University of Buenos Aires (1990) and his Ph.D. in Biology at UC San Diego (1996). He was postdoctoral fellow in Mu-ming Poo's lab at UCSD and later in Fred Gage's lab at the Salk Institute. Since 2002, he has been the head of the Neuronal Plasticity Laboratory at the Leloir Institute in Buenos Aires, devoted to research in adult neurogenesis. He was International Research Scholar of the Howard Hughes Medical Institute (HHMI, 2007–2017), President of the Argentine Society for Neuroscience (2011-2013), and President of the Leloir Institute Foundation (2013-2020). Schinder is the recipient of various awards including the 2010 John Guggenheim Fellowship, the 2013 Friedrich Wilhelm Bessel Research Award from the Humboldt Foundation, and the 2020 Prize in Medical Sciences from The World Academy of Sciences. He is member of the Latin American Academy of Sciences (ACAL), and the editorial boards of Cell Reports, IBRO Reports, Brain Plasticity, Frontiers in Neurogenesis and Frontiers in Neural Circuits.

### **Publications:**

Transcriptional dynamics orchestrating the development and integration of neurons born in the adult hippocampus. Rasetto NB, Giacomini D, Berardino AA, Waichman TV, Beckel MS, Di Bella DJ, Brown J, Davies-Sala MG, Gerhardinger C, Lie DC, Arlotta P, Chernomoretz A, Schinder AF. bioRxiv [Preprint]. 2024 Jan 11. A disinaptic feedback network activated by experience promotes the integration of new granule cells. Alvarez DD, Giacomini D, Yang SM, Trincherro MF, Temprana SG, Büttner KA, Beltramone N, Schinder AF. Unique processing during a period of high excitation/inhibition balance in adult-born neurons. Marín-Burgin A, Mongiat LA, Pardi MB, Schinder AF. Science. 2012 Mar 9;335(6073):1238-42.

**Salle de séminaire 1er étage - CNP**