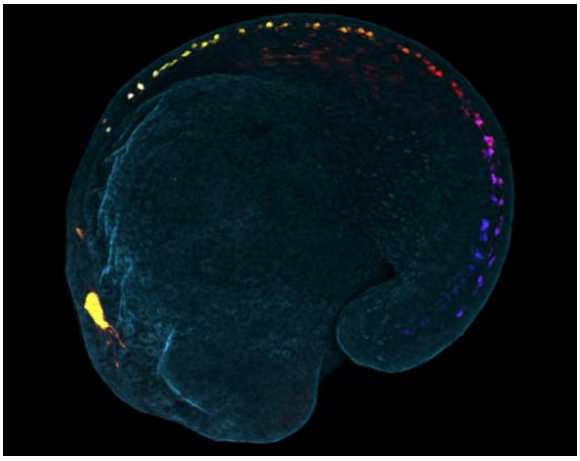
External seminars – Joaquin Navajas Acedo (Senior Postdoc, Alex Schier's lab)



Laboratoire de l'invité/Laboratory of the speaker

Biozentrum, University of Basel (Prof. Alex Schier lab)

Invité par/Invited by

Zayna Chaker

Date

07/04/2025, 11am, Salle des Thèses

Titre de la présentation/Title of the presentation

Spatiotemporal Emergence of Somatosensory Neuron Diversity

Résumé/Short abstract

The somatosensorysystem of animals detects stimuli and translates them into appropriate behavioral actionsnecessary for survival. To accurately process sensory stimuli, neuronal circuits of the spinal cord must be built and organized into functional networks with precise physiologicaland molecular properties. It is largely unclear how neuronal diversity emerges at the molecular and cellular levels in the vertebrate somatosensory system. During zebrafish development, the primary somatosensory system of Rohon-Beard neurons of the trunk develops first and is thought to undergo programmed cell death and disappear, to be then functionally replaced by the neurons of the Dorsal Root Ganglia. Our work combining imaging and single-cell transcriptomics across development-shows that contrary to the 150-year-old assumption, Rohon-Beard neurons do not disappear during larval stages. Furthermore, our deep single-cell transcriptomics experimentsacross zebrafish developmentreveal that rather than being a homogeneous population, Rohon-Beard neurons possess complex neuronal diversity and are heterogeneous at three levels: (i)their transcriptome, (ii) their axial distribution and (iii)interindividual distribution. In totocell lineage

reconstruction from gastrulation until the first day of lifeshows Rohon-Beard neurons possess very simple cell lineages, making possible to link neuron diversityandcell behaviors. Our current work useswhole-mount MERFISH spatial transcriptomicsto define the expression of dozens of transcription factors and genes associated with somatosensory function inRohon-Beard neurons during development. Furthermore, we are performingsystematic genetic manipulations to linkgene expression and cell lineages tothe observed neuronal subtypes. This research will help elucidatehow neuronal diversity arises,and comprehensively definethesequentialmolecular cascade and cell behaviors necessary for somatosensory neuron diversification

Mini-CV/Short CV

Joaquin is developmental biologist, passionate about science and science communication. He did his masters at Universidad Autonoma de Madrid, Spain, working on the axonal cytoskeleton in mouse neurons. He then moved to tha US at Stowers Institute of Medical Research in the lab of Tatjana Piotrowski, and produced beautiful work on the role of Wnt and PCP pathways during the establishment of hair cell orientation in the lateral line of Zebrafish. He then joined Alex Schier's lab at Harvard then at the Biozentrum, University of Basel, where is now developing his independent line of research on the spatiotemporal emergence of neuronal diversity in the somatosensory system of Zebrafish.