

## Chen Institute Symposium 2021

**Speaker:** John Ngai

**Title:** Illuminating Neural Stem Cell Trajectories at Single Cell Resolution

**Abstract:** The generation of neuronal diversity in the nervous system requires the specification and differentiation of a multitude of cellular lineages. The regulatory programs governing the differentiation of mature neurons from their progenitors remain incompletely characterized, however, in part because of the difficulty in studying neuronal progenitor cells in their native environments. In the vertebrate olfactory system, primary sensory neurons are continuously regenerated throughout adult life via the proliferation and differentiation of multipotent neural stem cells. Upon severe injury, these adult tissue stem cells are activated and go on to reconstitute all of the cellular constituents of this sensory epithelium. The regenerative capacity of the olfactory epithelium therefore presents a powerful and experimentally accessible paradigm for elucidating the mechanisms regulating neural stem cell function. I will present recent studies employing single cell transcriptomic and epigenomic analyses that give insights into the genetic and epigenetic programs that both define and regulate olfactory neurogenesis during regeneration.