



“Neotenic expansion of new hippocampal neurons reconfigures inhibition to enhance social cognition”

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Hosted by: Associate Professor Jagan Srinivasan

***Tuesday, April 9th 12pm
Gateway 1002
Pizza will be served***

Abstract:

The dentate gyrus subregion of the hippocampus is host to generation of new or adult-born dentate granule cells (abDGCs) throughout life. Work from many labs has shown that immature abDGCs exhibit heightened synaptic and structural plasticity and preferentially contribute to cognition. Analysis of adult hippocampal neurogenesis in non-human primates and humans suggests that abDGCs undergo a protracted period of maturation or neoteny. However, the significance of this neoteny is not known. Here, we engineer a genetic strategy to selectively expand a population of immature or mature age-matched abDGCs and assess the impact of this expansion on circuit properties, network oscillations and social cognition. Using a combination of mouse genetics, ex vivo and in vivo electrophysiology, chemogenetics and behavior, we show that expansion of immature, but not mature abDGCs, reconfigures parvalbumin inhibitory neuron mediated inhibition of CA2 and network properties to enhance social cognition.

Bio:

Amar Sahay is a professor of psychiatry at Harvard Medical School, a James and Audrey Foster MGH research scholar, a principal faculty member of the Harvard Stem Cell Institute, and an associate member of the Broad Institute of MIT and Harvard. Sahay earned his bachelor's degree from Bennington College and performed undergraduate research at Rockefeller University. After a year studying signal transduction in Yosef Yarden's laboratory at the Weizmann Institute of Science, Sahay earned his doctorate from the Johns Hopkins University School of Medicine, where he investigated the role of secreted semaphorins in neural circuit formation and synaptic transmission in the laboratories of Alex Kolodkin and David Ginty. Following postdoctoral research interrogating the role of adult hippocampal neurogenesis in memory in Rene Hen's laboratory at Columbia University, Sahay established his own laboratory to investigate how hippocampal circuit and network plasticity mechanisms may be harnessed to rejuvenate, reengineer and repair memory and emotion circuits in adulthood and during aging. Sahay is the recipient of numerous awards, including the National Institutes of Health Pathway to Independence Award, RO1s (National Institute of Mental Health, National Institute on Aging), the Ellison New Scholar in Aging Award, NARSAD Young Investigator and Independent Investigator grants, the Whitehall Foundation Award, a Harvard Stem Cell Institute grant, the Inscopix Decode Award, an Alzheimer's Association grant, and career development awards from the Society for Neuroscience and the American College of Neuropsychopharmacology. Sahay's research has been published in *Nature*, *Neuron*, *Nature Medicine*, *Nature Neuroscience*, *Nature Communications* and *Cell Reports*. Sahay is committed to mentoring, and his trainees have been awarded NARSAD Young Investigator grants for postdoctoral fellows, HHMI Gilliam fellowships and the Hoopes Prize (Harvard College's highest honor for an undergraduate thesis).