



Division of Biology and
Biological Engineering



Merkin Institute
for Translational Research

Biology Seminar

Wednesday, March 4, 2026 ~ 1 pm

Reception - 12:30 pm

Chen 100

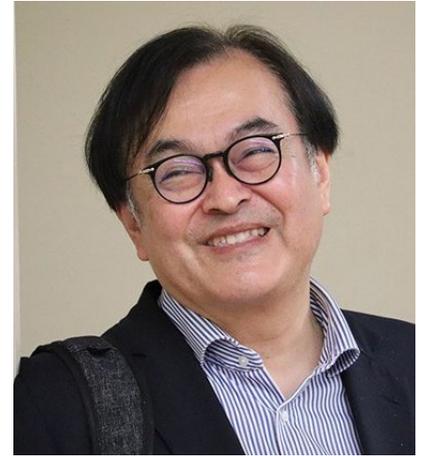
Tadashi Isa, M.D. & Ph.D.

Department of Neuroscience, Graduate School of
Medicine, Kyoto University

Institute for the Advanced Study of Human Biology
(WPI-ASHBi), Kyoto University

National Institute for Physiological Sciences, Japan

Faculty Host: Viviana Gradinaru, Merkin Institute for
Translational Research



From genetic tools to motor recovery, decision and disease modeling in nonhuman primates

What are unique to primates include (1) fine hand motor skill which is often affected by stroke or spinal cord injury, and (2) high level cognition, including flexible decision making, which is often affected in neuropsychiatric disorders. Both of them are difficult to replicate in rodent models. During the past 2-3 decades, our group has been working on the neural mechanisms of recovery of dexterous hand movements after partial spinal cord injury by applying multi-disciplinary approaches including electrophysiology, neuroanatomy, non-invasive brain imaging, pharmacological intervention, and chemogenetic or optogenetic pathway-selective manipulation techniques with viral vectors in macaque monkeys. Using these techniques, we are also extending our research to understanding the neural mechanisms underlying visuomotor systems preserved after damage to the primary visual cortex (blindsight), and flexible decision making based on motivation or risk preference. Furthermore, we are applying our disciplines to understanding the neural mechanisms of phenotypes of neuropsychiatric disorders created by genome editing in macaques. I will also talk about all these studies on nonhuman primates and also on the future perspectives of our studies.

Caltech will be taking photos/video at this event for use in advertising and other promotional materials, whether in print, electronic, or other media.