

**Speaker:** Viviana Gradinaru, Professor of Neuroscience and Biological Engineering; Director, Center for Molecular and Cellular Neuroscience

**Title:** Getting across barriers: Gene delivery across the blood-brain barrier for precise and minimally-invasive study and repair of nervous systems

**Abstract:** Protein engineering and data science have helped overcome challenges in optogenetics and gene delivery, with microbial opsins tolerated by mammalian cells and viral capsids that cross the blood-brain barrier. These tools are applied to neurodevelopmental and neurodegenerative disorders, for e.g. to understand circuits underlying locomotion and sleep for Parkinson's disease. By understanding how engineered capsids work and leveraging them as vehicles for targeted gene delivery via the vasculature, we are now closer to precise noninvasive study and repair of nervous systems.