**Chen Institute Symposium 2023**

**Speaker:** Richard Axel

**Talk title:** Representations of Intrinsic and Extrinsic Value in Prefrontal Cortex  
  
**Abstract:** The representation of odor in olfactory cortex (piriform) is distributive and unstructured and can only be afforded value upon learning. We have performed optical imaging of neural activity during associative conditioning to identify brain regions that exhibit representations of learned value. Odors predictive of “extrinisic” appetitive values (water reward) activate a transient representation of value in orbitofrontal cortex (OFC) and a stable representation of value in medial prefrontal cortex. Representational instability may be a pervasive property of association cortices and consolidation must transform transience to persistence.  Animals are also motivated to seek information of no apparent “extrinsic value”, information that does not influence reward outcome. We have developed a behavioral paradigm for information seeking that reveals that mice exhibit this “desire to know”. Moreover, we identify a representation of the “intrinsic value” of information in OFC distinct from the representation of extrinsic reward. Thus, mice exhibit innate pathways that represent a desire to acquire information of no apparent objective value.