**Hybrid Voltage Indicators for Imaging Neural Activity**

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Membrane voltage is an important biophysical signal. Optical mapping of membrane voltage enables investigation of electrical signaling at high spatial resolutions and with high throughput. In this talk, I will describe a recently developed fluorescent voltage indicator scaffold (Flare1) that builds upon the site-specific modification of microbial rhodopsin with organic fluorophores. Flare1 achieved 36% ΔF/F per 100 mV voltage change with sub-millisecond response kinetics, thus representing one of the most sensitive and fast orange-colored voltage indicators. This technique has enabled observation of long-range electrical coupling among mammalian cells that was mediated via gap-junctions. Combining the superior brightness and photostability of small molecules with genetic targeting of microbial rhodopsin proteins, this design strategy can be extended for developing novel fluorescent indicators.

**References**

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**Biography**

Peng Zou is currently an Assistant Professor at the Department of Chemical Biology, College of Chemistry and Molecular Engineering of Peking University (PKU). He received his Bachelor’s degree in Chemistry and in Physics from PKU in 2007, and his PhD in Biological Chemistry (with Alice Ting) from MIT in 2012. He was a postdoc fellow at Harvard University (with Adam Cohen) from 2013 to 2015, before returning to PKU to start his faculty appointment. He is affiliated with the Synthetic and Functional Biomolecules Center, Peking-Tsinghua Center for Life Sciences and the PKU-IDG/McGovern Institute for Brain Research as Principle Investigator. His research focuses on developing chemistry-enabled tools for studying the structure, dynamics, and function of neurons.

