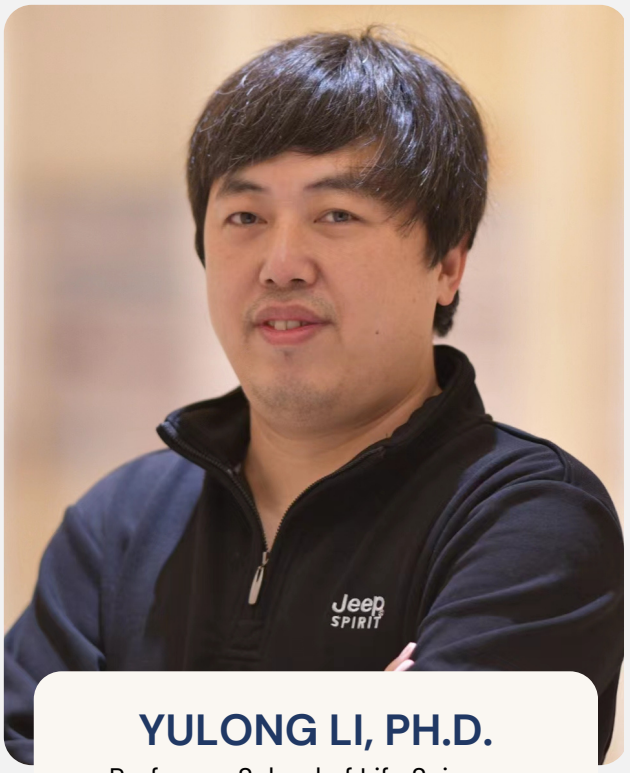
VANDERBILT
School *of* Medicine Basic Sciences
Department of Pharmacology

LAMSON MEMORIAL LECTURE

Spying on Neuromodulator Dynamics In Vivo by Constructing Multi-Color Genetically-Encoded Sensors

The human brain consists of billions of neurons, most of which communicate with each other by releasing different kinds of neuromodulators through chemical synapses, and therefore is able to control different physiological functions like perception, motion, learning and memory. To dissect the mechanism underlying how brain take part in different physiological functions and pathological conditions, it's important to monitor the dynamics of neuromodulators in vivo. In the past few years, we and others have developed a series of multi-color GPCR-activation–based (GRAB) sensors for monitoring extracellular neuromodulator dynamics with high sensitivity, specificity, and spatial-temporal resolution in living animals. In this report, I will share our recent progress in developing sensors for monitoring monoamines, nucleotides, neurolipids and neuropeptides. With these GRAB sensors, we have monitored the dynamics of neuromodulators in mice in a wide range of physiological processes (sleep-wake cycle, motion, etc.) and pathological conditions (epilepsy, etc.).



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