

An optimized green fluorescent protein biosensor for the inhibitory neurotransmitter GABA

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POSTER

The human brain controls all sensory perception, thought and almost all motor movements. This function is achieved by relaying electrical signals through neurons in the central nervous system. These electrical signals are communicated from one neuron to the next through the release of neurotransmitters at synapses. The main inhibitory neurotransmitter at these synapses is GABA. Currently, imaging of GABA synaptic activity in model organisms is not possible, but is crucial to improve our understanding of the brain. To visualize synaptic release and uptake of GABA, we propose a fluorescent protein-based biosensor that will enable us to image the release of GABA in tissue slices and model organisms. The Campbell lab has successfully generated a prototype for a green fluorescent GABA biosensor based on a GABA binding domain from *Agrobacterium tumefaciens*. Using molecular biology and screening in mammalian cells, the fluorescent GABA biosensor will be evolved to be practically useful for imaging in neuronal cultures and brain slices of model organisms.