



Jeffrey C. Magee, PhD

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Neuroscience

*A Directed Form of Synaptic Plasticity Underlies Hippocampal Representations*

Overall the primary interest of the lab is in producing a biophysically based understanding of cortical circuit function. The lab has a long-standing interest in active input processing in neuronal dendrites and its role in learning and memory. We use a variety of electrical (whole-cell, juxtacellular, silicon probe) and optical (two-photon) recording and optogenetic manipulation techniques both in behaving animals and in brain slices. Magee received his PhD from Tulane University in physiology for work on ion channels and synaptic transmission in 1992. He next worked as a postdoctoral fellow in Dan Johnston's lab at Baylor College of Medicine where they began studies on the active properties of dendrites and dendritic integration. He subsequently started his own lab at LSU Medical School in New Orleans in 1997 where he continued to work on the integrative properties of neuronal dendrites and their role in neuronal information processing and storage. He next joined the newly formed Janelia Farm Research Campus of HHMI in 2006 where he expanded his research into the role of active dendritic integration and its regulation by various neuronal microcircuit elements in determining the fundamental feature selectivity of cortical neurons. At this point most work in the laboratory was in behaving animals. Finally, Magee has recently (2018) moved his lab back to Baylor College of Medicine where they are attempting to determine the mechanisms of experience-dependent shaping of network representations in the hippocampus and barrel cortex. They are also trying to understand the behavioral impact of this representation learning.