

The Cells Driving our Brain's Navigation System



Stefan Leutgeb
Associate Biology, Neurobiology

CURRENT RESEARCH

Mapping the brain's internal GPS to treat neurodegenerative disorders and diseases

The brain has marvelous tools for navigating around the world each day and remembering places we have been before. In fact, the 2014 Nobel Prize in Medicine was awarded to the scientists that found the grid and place cells -- the neurons responsible for navigation and remembering spatial locations -- with each cell using various sensory information to remember a specific location like a coordinate on a map. Dr. Stefan Leutgeb, Associate Professor of Neurobiology Section at the University of California, San Diego, is helping to advance the study of place and grid cells that make up the neural circuits that constitute the brain's internal GPS. He and his team hope to learn how these circuits support navigation to preferred destinations. This internal GPS system is dysfunctional in psychiatric and neurological diseases, including Alzheimer's disease, schizophrenia, stroke, and symptoms of TBI's. Therefore, Dr. Leutgeb's research is helping to develop a basic understanding of how these cells work, and may someday lead to treatment approaches that are targeted at restoring function in patients that have memory loss.

Dr. Leutgeb's team of graduate students and postdoctoral researchers, alongside his many collaborations with leading researchers, has produced compelling studies over the past years on the effects of manipulating parts of the neural brain circuits. However, scientists do not yet understand how the firing of neurons helps a person navigate and remember environments. Therefore, he and his team are working towards mapping the way in which internal brain computations generate navigation abilities. Specifically, Dr. Leutgeb is interested in the neuronal activity patterns that directly correspond to...

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AFFILIATION

 University of California, San Diego

EDUCATION

- Ph.D., Neuroscience, 2000 , University of Utah

AWARDS

- Kavli Faculty Fellow of the Kavli Institute of Brain and Mind, UC San Diego
- Ellison Medical Foundation New Scholar in Aging
- Sloan Research Fellow, Alfred P. Sloan Foundation
- Walter F. Heiligenberg Professorship in Neuroethology

RESEARCH AREAS

Life Science, Neurological / Cognitive, Veteran's Causes

FUNDING REQUEST

Your contributions will support the continued research of Dr. Stefan Leutgeb, as he makes sense of the sophisticated neurons that the brain uses for memory and navigation. Donations will fund the necessary \$150K/year required to systematically test the role of all cell types in the circuits and thereby develop a complete functional mapping between circuits and a cognitive function. The circuits investigated are dysfunctional in psychiatric and neurological diseases; therefore, your support will contribute to new treatment approaches that restore function in Alzheimer's disease, epilepsy, and schizophrenia.