The Cellular Basis of Learning and Memory

George Langford
Distinguished Professor of Neuroscience & Professor of Biology

CURRENT RESEARCH

Understanding age-related cell death in the brain to prevent it from happening

It is believed that neurodegenerative diseases, like Alzheimer's and Parkinson's, result from cell death; however, it is unknown how or why cell death occurs. One potential cause are a family of proteins called molecular motors, that fail to function in the transportation of replacement components and nutrients. Dr. George Langford, Distinguished Professor of Neuroscience and Professor of Biology at Syracuse University, is interested in the cellular basis of learning and memory. By studying the way in which information is stored in the brain -- particularly the role of molecular motors -- Dr. Langford is working to understand the molecular mechanisms responsible for neurodegeneration. Through the understanding of such mechanisms, Dr. Langford and his team hope to lead to the discovery of new drug targets that could be useful in preventing neurodegenerative disease as well as candidiasis. Thus, his work is inspired by the hope that someday it may be possible to unravel the dynamic changes of the synapse in order to treat patients with memory loss or other symptoms associated with neurodegenerative diseases.

Dr. Langford's expertise in the proteins of the cytoskeleton, or the transportation system in the nerve cells, has allowed him to observe dynamic changes in living cells in a novel and exciting way. His cutting-edge super resolution imaging techniques allow him to visualize molecular motors and the cargo they carry, the changing shapes of the cell, and the movements of the cell. With close collaborations with colleagues in Germany, at the Marine Biological Laboratory, and at the University of California, San Francisco, Dr. Langford and his team are making advances in our current understanding of how...

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AFFILIATION

Syracuse University

EDUCATION

- Ph.D., 1971 , Illinois Institute of Technology
- Postdoctoral Fellow, 1973 , University of Pennsylvania
- B.S., 1966 , Fayetteville State University, North Carolina

AWARDS

- 2009 Illinois Institute of Technology Professional Achievement Award
- Summer 2004, Guest Scientist/Lecturer NIH Undergraduate Scholarship Program
- 2004, Keynote Speaker, The Ninth Annual John W. Diggs Lecture, NIH
- Featured Cell Biologist in the CAMPBELL & REECE textbook: Biology Sixth Edition, Neil Campbell and Jane Reece, Benjamin Cummings, New York 2002 pages 106-107
- Honorary Degree awarded by Beloit College: Doctor of Humane Letters, 2001

RESEARCH AREAS

Life Science, Infectious, Neurological / Cognitive, Oncology / Cancer

FUNDING REQUEST

Your contributions will support the continued research of Dr. George Langford, of Syracuse University, as he unravels the dynamic changes in the brain. Donations will fund the necessary $45K/year required for a technician, $20K/year for supplies, and $30K/year for internships. An additional $250K will allow for the one time purchase of a spectrometer. In choosing to donate, you will play a role in developing future treatments for patients with memory loss.