B M Salzberg, J Bioengineer & Biomedical Sci 2015, 5:1
http://dx.doi.org/10.4172/2155-9538.S1.002

OMICS International
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International Conference on
Significant Advances in Biomedical Engineering
April 27-29, 2015 Philadelphia, USA

Intrinsic optical changes in mammalian nerve terminals

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Although much our work has involved extrinsic optical probes of membrane potential and ion activities, i.e., voltage-sensitive dyes and calcium indicator dyes, I will concentrate today on intrinsic optical methods. I will discuss findings using light scattering, auto-fluorescence, and atomic force microscopy, and, in particular, what we can learn from these approaches about the behavior of vertebrate nerve terminals during neuropeptide release. Light scattering changes are often coupled to volume changes; auto-fluorescence may reveal mitochondrial activity, particularly oxidative phosphorylation; and atomic force microscopy, when of sufficiently high bandwidth, can tell us about very rapid volume changes that may be related to water movement through ion channels. All of these phenomena relate to the behavior of neurohypophysial nerve terminals following the arrival of the action potential (and action currents).

Biography

B M Salzberg completed his PhD degree in Physics (Harvard) in 1972, and spent four years as a Postdoc at the Yale School of Medicine. He has been a faculty member at the University of Pennsylvania since 1975, where he is Professor of Neuroscience and Physiology. He was Trustee of the Marine Biological Lab (1980-84, 1987-95) and is a member of the Society of General Physiologists (Council, 1986-88), and the Biophysical Society (Council, 1987-90, 1998-2001, Executive Board, 1987-90, 2000-02). He is a Fellow of the A.A.A.S., the A.P.S. and the O.S.A., and has published numerous widely cited papers in Physiology and Neuroscience.

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