Dynamin: Conformational Dynamics and Ligand-Induced Self-Association

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Background:

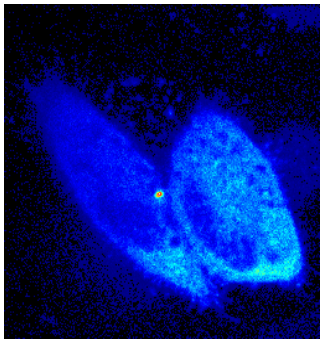
We are using state-of-the-art fluorescence methodologies combined with molecular biological approaches to study the self-association and conformational dynamics of the large GTPase dynamin. These studies are being carried out both *in vitro* and *in vivo* using steady-state and time-resolved fluorescence as well as multiphoton Fluorescence Correlation Spectroscopy (FCS).

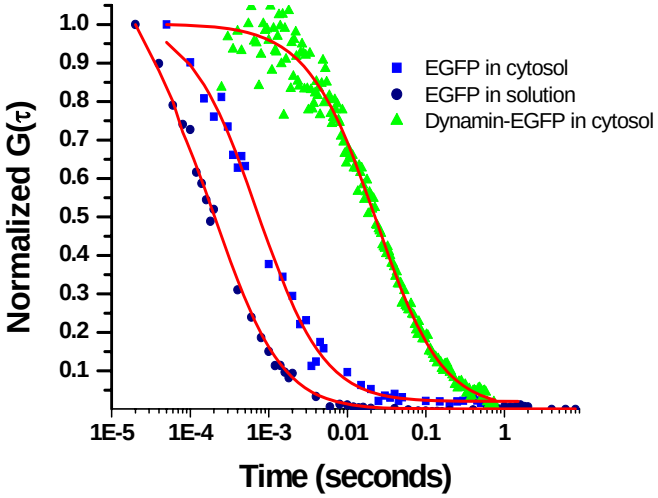
Outcomes:

We seek an improved understanding of the biological function of dynamin in diverse biological processes including receptor mediated endocytosis and synaptic vesicle recycling.

Progress to date:

We have extensively characterized the kinetic properties of dynamin using stopped-flow fluorescence methods. We are also studying the oligomerization state of dynamin in living cells, both in the cytoplasm and the nucleus. These latter studies utilize two-photon FCS and the Photon Counting Histogram method of analysis.





Above: Two-photon scanning images of HeLa cells transfected with EGFP-dynamin.
Right: FCS data for EGFP in solution and for EGFP and EGFP-dynamin in the cytosol of HeLa cells

Timeline:

This project is long term. We will continue to study the basic biochemistry and cell biology of this important protein system since the ultimate goal is basic knowledge.