

Bankhead-Coley Cancer Research Program

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*Molecular Medicine
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*2010 Program
Postdoctoral Research Fellowship
(3-year project)*

Project Title: Structural and functional characterization of the ras protein acyl transferase, DHHC9/Gcp16

Project Summary: Cancer can be defined as a condition in which abnormal cells exhibit uncontrolled growth. One important cell-signaling protein, Ras, is mutated in 50 percent of all human cancers. In order for Ras to function, it must be transported to different parts of the cell. Oncogenic, or cancerous, forms of Ras are active all the time, but can be turned off by preventing localization. Therefore, the machinery responsible for Ras transport is an attractive candidate for anti-cancer therapeutics. In order to develop effective anti-cancer drugs, we need to know what the transport machinery looks like and how it works. More specifically, the focus of this study is a protein called DHHC9/Gcp16, which has been shown to be involved in the lipidation of Ras and its activity as a cancer-causing protein. The long-term research goal is to answer questions regarding the 3D structure of DHHC9/Gcp16. This project will employ a powerful technique called Nuclear Magnetic Resonance spectroscopy to probe the structural features of DHHC9/Gcp16. Additional project goals are to explore how DHHC9/Gcp16 works and to monitor its function using enzymatic assays, a method for measuring enzymatic activity. Results from this work will increase our knowledge of how cancer progresses and contribute to the development of novel anti-cancer drugs.