

Bankhead-Coley Cancer Research Program

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Bridge (1-year project)*

Project Title: Photodynamic Therapy Development Using NF1 Tumor Xenografts

Project Summary: Photodynamic therapy (PDT) is an established cancer therapy that involves the selective uptake of a photosensitizer by tumor cells that when activated with light results in selective tumor destruction. Neurofibromatosis (NF1) is a genetic disease associated with a high risk of tumors that affect peripheral nerves. To our knowledge, no experimental or clinical evaluation of PDT for NF1 or other peripheral nerve tumors has been conducted. The objective of this project is to develop PDT for eradication of NF1 tumors. We hypothesize that the unique anatomic properties of peripheral nerve and vascular permeability of nerve sheath tumors allow for highly effective tumor destruction using PDT without incurring collateral nerve damage.

Specific aims are:

- (1) To test the uptake and accumulation of photosensitizers in numerous human NF1 tumor cell lines and other cultures of normal nerve cells.
- (2) To determine the mode of action and efficacy of PDT using different classes of photosensitizers when applied to NF1 tumors grown in the nerves of mice.

These studies will provide essential foundation information to develop an optimal PDT protocol and conduct a preclinical, federally funded study for eradication of NF1 tumor xenografts in mice. Our goal is to discover and develop PDT's potential for better tumor control without sacrificing normal nerve function and, ultimately, to provide a safe therapy for better clinical outcomes and quality of life for patients with peripheral nerve sheath tumors.