

Bankhead-Coley Cancer Research Program

McFadden, Grant

*Molecular Genetics & Microbiology
University of Florida*

*2010 Program
Team Science Project
(3-year project)*

Project Title: Exploiting Oncolytic Virotherapy to Selectively Target Human Hematopoietic Cancer Stem Cells

Project Summary: The purpose of this project is to develop an oncolytic (“cancer-killing”) virus called myxoma virus for a new clinical procedure to eliminate cancer cells from preparations of bone marrow-derived stem cells that are needed to restore the patient immune system following high-dose chemotherapy. This is a new strategy to make autologous blood and marrow transplantation (ABMT) available for many more cancer patients, such as those with advanced leukemias and lymphomas, who are currently ineligible for ABMT because their stem cell preparations are contaminated with their own cancer cells. The project exploits the natural ability of this virus to selectively infect and eliminate a variety of human cancer cells, including leukemic stem cells, prior to transplant but spare the normal human blood stem cells needed for immune reconstitution. The selective cancer-killing potential of this particular virus for human cancer cells has now been validated in a variety of animal models of brain cancer and metastatic melanoma. This new project offers the near-term potential to establish clinical trials that will allow many more leukemia and lymphoma patients to become eligible for ABMT therapy in the future.