

Bankhead-Coley Cancer Research Program

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*2007 Program
New Investigator (3-year project)*

Project Title: Role of VEGFR1+CD11b+ Myeloid Cells in Tumor-Induced Immune Suppression

Project Summary: Renal cell carcinoma (RCC) accounts for more than 30,000 new cases of cancer and more than 12,000 deaths in the United States annually. While novel therapies and cancer vaccines are being developed, the success of these therapies requires a strong immune response and immune competence of patients. This grant takes advantage of the recent finding of specific population inflammatory immunosuppressive cells in patients with renal cell carcinoma and the availability of targeted agents that are active against this disease. Our studies assess the association of specific circulating immunosuppressive cell populations with certain stages of cancer disease and metastatic process. This may help to identify potential patients who will benefit from specific anti-VEGF therapy. Furthermore, combination of anti-VEGF therapy with a specific cancer vaccine could significantly enhance anti-tumor immune response and increase survival rate of cancer patients. The major goal of this research is to establish whether targeting of VEGFR1 can reverse immune suppression and improve the effect of cancer immune therapy. A combination of immunologic, biochemical, and molecular approaches are being used to address these questions. Three specific aims are designed to achieve the research goal. The first part of this study is focused on analysis of the VEGFR1-positive myeloid cells present in tumor host. This will provide us with valuable information on specific features of circulating immunosuppressive cells and may show its association with certain stages of cancer disease. The second part of our study is designed for several series of experiments to better understand the molecular mechanisms of tumor-induced immune suppression mediated by these cells. The third part of our study is designed to test whether targeting of VEGF-VEFR1 axis in tumor-bearing mice could enhance the therapeutic effect of a cancer vaccine directed against murine renal cell carcinoma. Information obtained in this research will be extremely useful for the design of future clinical trials using both anti-angiogenic and immunotherapeutic approaches for treatment of patients with renal cell carcinoma. All studies are being conducted at Cancer & Genetics Research Building, Shands Cancer Center, University of Florida, Gainesville, FL.