2008 Reseach Grants

Memorial Sloan Kettering Cancer Center - Drs. Oren Becker and Rosandra Kaplan

Stromal Contribution of Bone Marrow Progenitors in Medulloblastoma.

Meduloblastomas are brain tumors that arise in the cerebellum ofchildren. Using animal models, this study examines whethermedulloblastomas contain cells that originate from the bone marrow. Recently, it has been observed that in adults, bone marrow derivedcells contribute to the formation of tumor blood vessels and assisttumor cells to invade normal tissue. These researchers hypothesizethat these bone marrow derived cells act the same way in children'sbrain tumors. Medulloblastoma cancer stem cells reside near bloodvessels and are more resistant to treatment with radiation andcisplatin. Cells derived from the bone marrow may also be moreresistant to such treatment and may play a role in supporting thecancer stem cells. In this study the researchers will use drugs thatinhibit bone marrow derived cells of medulloblastoma-bearing mice toassess if medulloblastoma tumor growth will be affected. They will usethese inhibitors to determine if they increase the effectiveness ofradiation and chemotherapy. They will also study the number of bonemarrow derived cells in the blood and cerebrospinal fluid of childrenwith brain tumors to determine if the number of these cells correlateswith the stage or tumor recurrence. They hypothesize that drugs thatcan block bone marrow derived cells are potential novel treatments forchildren with brain tumors.

Dana-Farber Cancer Institute Dr. Mark Kieran

PhaseI Study of AdV-tk+ Prodrug Therapy in Combination with RadiationTherapy for Pediatric Brain Tumors

Childhood brain tumors called gliomas – those that arise in the glialcells – typically have a poor outcome. Patients suffering from thisdisease usually survive for only a short number of months, soinnovative approaches to treatment are critical. . This study is aPhase I clinical trial in which pediatric patients' gliomas will beremoved surgically, and a gene therapy vector, AdV-tk, will be injecteddirectly into the tumor site. In the days that follow, patients willreceive prodrug and standard radiotherapy; standard chemotherapy may beused as well. This approach will allow simultaneous targeting of thetumor with multiple methods. This multiple method therapy has beentested using animal models and has been successfully used in adultswith brain tumors and other cancers. This combination therapy showsgreat promise as an improved form of treatment for children with braintumors.

UCLA Medical Center - Dr. Joseph Lasky

Immunotherapeutic Targeting of Stem Cells in Pediatric Brain Tumors

Although surgery, chemotherapy, and radiation therapy work in somecases of childhood gliomas and medulloblastomas, the devastating sideeffects of these therapies and relative lack of efficacy necessitatethe development of novel, targeted therapies for the developing brain. In this study, the research looks to harness the power of a person'sown immune system to fight these tumors. The researchers will attemptto identify immunogenic proteins expressed by the brain tumor stem cellpopulation. The genes, Bmi-1, SOX2, MELK, and FoxM1 have been shown toplay critical roles in cancer growth. T-cells which are capable ofproliferating and activating in response to these proteins will then betested against cell lines generated from pediatric tumor samples and inanimal models. The results will be used to develop individualizedvaccines for pediatric patients with brain tumors.