Brain Tumor Research in the Pediatric Brain Tumor Program

The Pediatric Brain Tumor Program is dedicated to both the care of current patients and improving the outcomes of future patients through research. We produce clinical trials for patients, work with cooperative groups to make available further clinical trials, and develop new therapies for children with brain tumors in the laboratory.

Recently, the Pediatric Brain Tumor Research Group presented a platform presentation at the Society of Neuro-Oncology in Phoenix, Arizona. The platform presentation discussed a novel approach to immunotherapy for medulloblastoma. This approach includes very small doses of radiation with antibody therapy.

Microglial cells can be one of two phenotypes, leading to cell death or tumor growth. The desirable phenotype in treatment of brain tumors is the M1 phenotype, which will lead to tumor cell death. This phenotype produces interleukins and TNF-α.

The combination of low-dose radiation and antibody therapy leads to a decrease in the viability of medulloblastoma cells (but not of healthy cortical neurons) (compare graphs on left vs. right below). The images to the right, below, demonstrate an increase in medulloblastoma cell death (top right) compared to neurons (bottom right) treated with the same therapy.

In summary, the combination of low-dose radiation and antibody therapy may well provide a new, effective therapy against the most aggressive forms of medulloblastomas in children.