

Role of TSC2 inactivation in brain development and medulloblastoma

The Childhood Brain Tumor Foundation generously provided support to my lab at Memorial Sloan-Kettering to conduct basic studies of cell biological events that may contribute to medulloblastoma occurrence and growth. Our studies were called “*mRNA translation machinery in medulloblastoma*”. We used a combination of primary neural cell cultures and mouse models for medulloblastoma to study how the conversion from messenger RNA to protein plays roles in normal and tumor cell division. When cells are dividing, it is necessary for them to grow in size and to make proteins that are involved in the process of cell division. The enzymes that regulate the production of new proteins—the “mRNA translation machinery” may therefore make good targets for new medulloblastoma treatments that might specifically block tumor growth while sparing the developing brain of young patients. During the course of our studies, we found that some of the mRNA translation machinery components not only affect new protein production, but also act directly on proteins whose function it is to stop cells from growing. When we treated mice bearing medulloblastomas with an inhibitor of the mRNA translation machinery, we saw that the cell growth-stopping proteins increased their levels and the tumors stopped expanding! These studies are described in a manuscript now in review for publication.

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