

RADIATION ONCOLOGY  
COLLEGE OF MEDICINE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

FOR APPLICATION YEAR: 2025

PROJECT TITLE: Targeting Microglia for Enhanced Therapy in Diffuse Midline Glioma (DMG)

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**Project Description**

This research focuses on Diffuse Midline Glioma (DMG), a highly aggressive pediatric brain tumor that develops along the brain's midline, with an incidence of 0.8 per 100,000 children annually in the United States. DMG affects children with a median age of 6-7 years and has limited treatment options. The project aims to explore innovative approaches to enhance DMG treatment outcomes using innovative treatment using microglia and radiation. DMG remains one of the most challenging childhood cancers due to its location and resistance to conventional therapies. Recent studies suggest that higher doses of radiation therapy may improve local control of the tumor, but these are limited by the risk of radiation brain injury (RIBI), which results in chronic neuroinflammation and further complicates patient outcomes. Our preliminary data and recent findings indicate that a specific subpopulation of microglia, termed MG3, possesses unique neuroprotective properties that may mitigate these effects and potentially control the tumor.