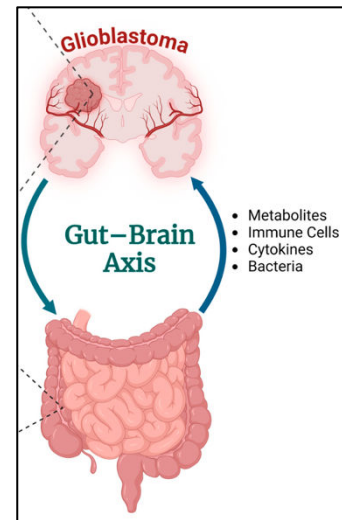


Dr. Braden C. McFarland's Research: Making Brain Cancer Treatments Work Better

Who I Am Trying to Help

- Patients with **glioblastoma (GBM)**, the most aggressive and deadly form of brain cancer, often do not benefit from promising immunotherapies that work in other cancers.
- My research seeks to understand why and how we can improve treatment outcomes.

My Research Focus → Big picture: The bacteria in the gut (gut microbiome) communicates with the immune system and brain, influencing glioblastoma growth and therapy response.



The Gut-Brain-Cancer Connection

- Investigate how bacteria living in the intestine influence brain tumors.
- Use **humanized microbiome mouse models**, where mice carry human gut microbial communities (transfer human stool samples into mice).
- Demonstrate that specific gut microbiomes can determine whether immunotherapy succeeds or fails.

Key Discoveries

- Human gut microbes can dramatically change the effectiveness of anti-PD-1 immunotherapy in glioblastoma models.
- Certain microbiome communities promote stronger anti-tumor immune responses and longer survival.
- Gut microbes influence which immune cells enter tumors and whether they become tumor-fighting or tumor-supporting cells.
- Microbial metabolites and immune signaling pathways may become future therapeutic targets for brain cancer treatment.

Research Vision: My long-term goal is to develop microbiome-informed precision medicine for brain cancer.

This means:

- Predicting which patients will respond to immunotherapy.
- Modifying the gut microbiome to improve treatment success.
- Combining microbiome science, immunology, and cancer biology to create more effective therapies for glioblastoma patients.