

# Microglia Activation in Response to Glioma Cells in Pediatric and Adult Host Environment

Hanna Lagura, Katelyn Wang, Xi Guo, Niomi Kaiser, Alex Solomon, Emma Szczesniak and Susan L. Campbell  
 Virginia Tech School of Animal Sciences, Virginia Tech, Blacksburg VA, 24061

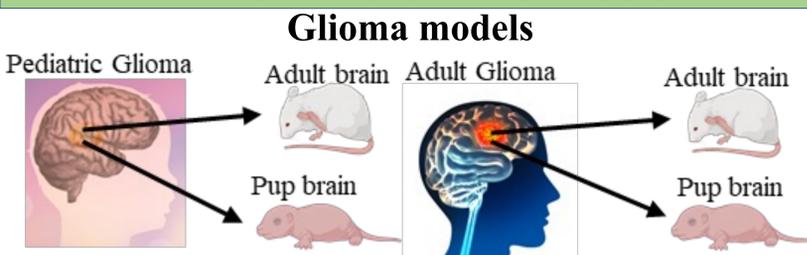
## Background

- Gliomas comprise of a group of brain tumor cells that originate from glial cells and replicate abnormally forming tumor masses in adults and children.
- Gliomas are the leading cause of cancer-related death and morbidity in children and adults.
- Pediatric and adult gliomas are phenotypically and molecularly distinct, therefore more targeted treatment options are needed.
- Microglia cells are the first form of defense to protect the brain in response to glioma, in a process called microgliosis.
- The goal of this study is to determine the role of the host brain environment in the process of microgliosis

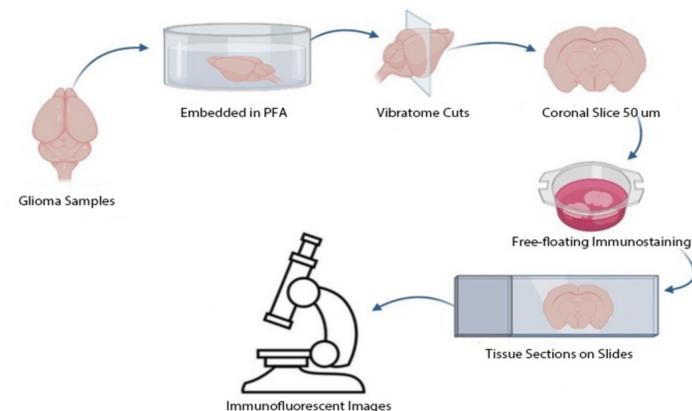
## Objective

- Compare microglia activation in pediatric and adult glioma mouse models.

## Materials & Methods

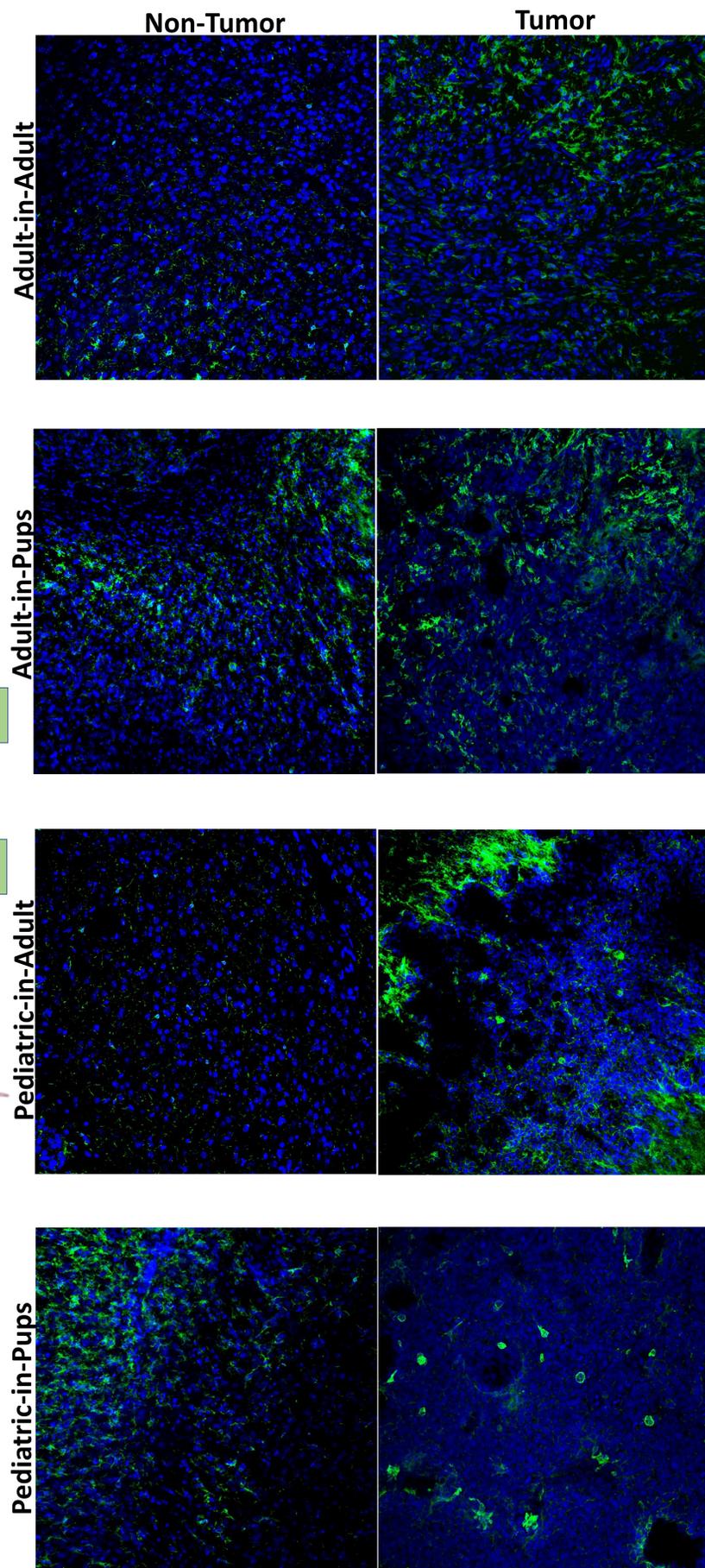


Immunohistochemistry (IHC) was performed to label microglia cells with IBA1 antibody and DAPI for cell nuclei.



Confocal microscope was used to capture images of immunolabelled brain slices. ImageJ software was used to analyze images.

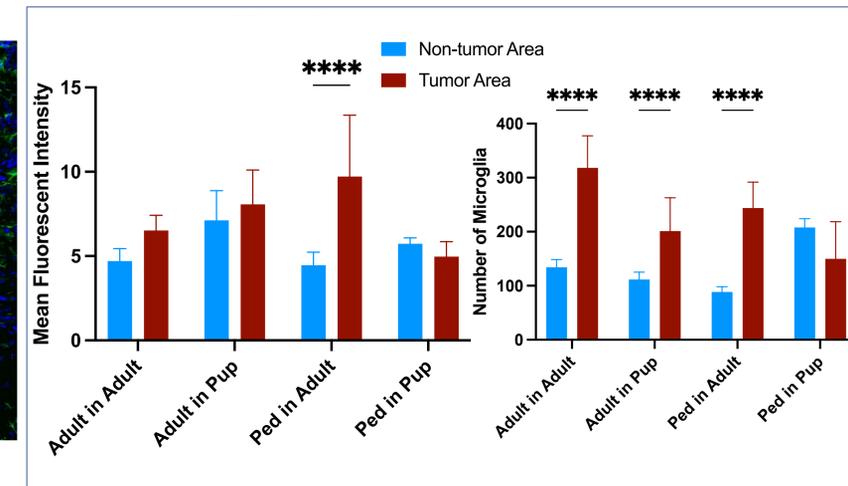
## Results



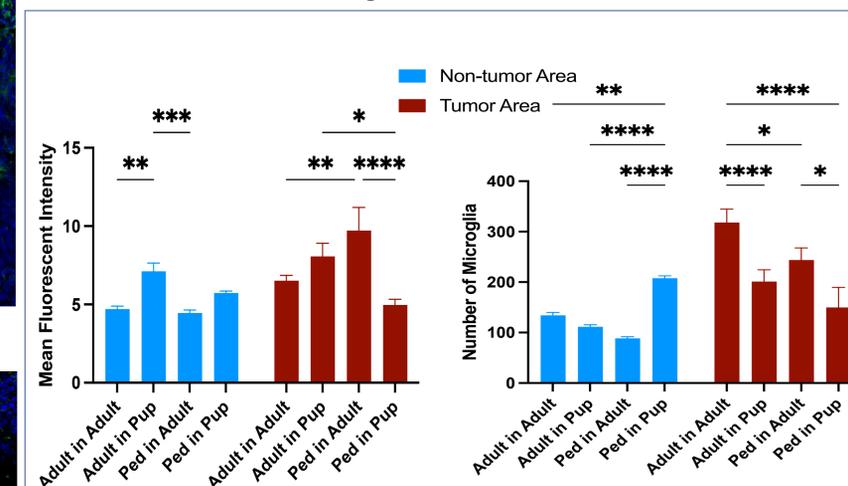
blue = DAPI; green = IBA-1

Immunostaining of IBA-1 and DAPI in cortical brain slices of glioma models.

## Results



Summary of IBA-1 fluorescent intensity and cell number in tumor and non-tumor regions.



Comparison of IBA-1 fluorescent intensity and cell number among glioma models.

## Conclusions

- The number of microglia cells is significantly higher in all tumor areas compared to non-tumor regions except the ped in pup group.
- There was a significant increase in the number of microglia cells in the adult in adult group compared to the other glioma groups.
- Tumors in the adult brain environment displayed significantly more microglia cells compared to tumors in the pediatric brain environment.

## References

Aggarwal P, Luo W, Pehlivan KC, Hoang H, Rajappa P, Cripe TP, Cassady KA, Lee DA, Cairo MS. Pediatric versus adult high grade glioma: Immunotherapeutic and genomic considerations. *Front Immunol.* 2022 Nov 22;13:1038096. doi: 10.3389/fimmu.2022.1038096. PMID: 36483545; PMCID: PMC9722734.

Greater L, Guzman R, Soleman J. Pediatric and Adult Low-Grade Gliomas: Where Do the Differences Lie? *Children (Basel).* 2021 Nov 22;8(11):1075. doi: 10.3390/children8111075. PMID: 34828788; PMCID: PMC8624473.