

## Title: Presence and spatial organization of dendritic cells and T-cells in diffuse gliomas

### Authors:

*Iida Salonen<sup>1,2</sup>, Miina Hoikka<sup>1,2</sup>, Laura Huhtala<sup>1,2</sup>, Göktug Karabiyik<sup>1,2</sup>, Aliisa Tiihonen<sup>1,2</sup>, Hannu Haapasalo<sup>2,3</sup>, Joonas Haapasalo<sup>2,4</sup>, Kirsi Rautajoki<sup>1,2</sup>*

<sup>1</sup> Faculty of Medicine and Health Technology, Tampere University

<sup>2</sup> TAYS Cancer Centre, Tampere University Hospital, Tampere, Finland

<sup>3</sup> Department of Pathology, Fimlab Laboratories PLC., Tampere University Hospital, Tampere, Finland

<sup>4</sup> Department of Neurosurgery, Tampere University Hospital, Tampere, Finland

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### Abstract

Diffuse gliomas are malignant tumors that develop in the central nervous system. These high-grade tumors are resistant to therapies, have high recurrence rates, and poor overall survival. Tumor microenvironments (TME) of these tumors are highly immunosuppressive, complicating the development of effective immunotherapies. Recent studies have revealed the presence of several dendritic cell (DC) subtypes within the TME of diffuse gliomas. As certain DC subtypes have a key role in priming and activating tumor-reactive cytotoxic CD8+T-cells, they provide one possible target to overcome the immunosuppressive environment. Thus, it is relevant to investigate their presence, frequencies, and spatial location within the TME of diffuse gliomas.

We will analyze the frequency and localization of DCs and T-cells using multiplex immunohistochemistry in 30 tumor tissue sections collected from glioblastoma and grade 4 diffuse astrocytoma patients. The fluorescence images from the antibody stainings are computationally overlaid and analyzed with a machine learning cell type classifier.

The preliminary results show that all three investigated DC subtypes, conventional type-1 DCs (cDC1s), conventional type-2 DCs (cDC2s) and plasmacytoid DCs, were identified in the samples. The most common subtype was cDC2, supported by previous studies of single-cell RNA-sequencing data. cDC2 cell density positively correlated with the density of B-cells and double-positive T-cells. T-cell densities positively correlated with each other. Moreover, when combining the T-cell subtypes together, there was positive correlation between the density of T-cells and cDC1s and cDC2s. In the future we will increase the number of samples and further study the spatial organization of DCs and T-cells.