

#### **O-12.4 Short talk**

##### **Elevated Pressure Modulates Glioblastoma and Astrocyte Responses: Insights from Flow-Based Cell Model**

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Increased intracranial pressure (ICP) is associated with various central nervous system (CNS) disorders, including CNS tumors. While the pathophysiological effects of high pressure (HP) on peripheral cells are well characterized, its impact on glioblastoma (GBM) and normal CNS cells remains unclear.

In this study, we employ a flow-based cell culture model with HP induction to investigate the combined effects of pressure and flow on GBM cells and astrocytes compared to static culture conditions. Using flow cytometry, immunostaining, and RT-PCR, we identify distinct cellular responses to HP exposure in both cell types.

Under HP, GBM cells exhibit enhanced proliferation and increased expression of G1-to-S phase transition genes (cyclins D and E), along with a significant upregulation of EGFR. In contrast, HP-exposed astrocytes experience oxidative stress, triggering cytoprotective mechanisms. Additionally, we observe increased expression of genes associated with reactive astrocytes and astrogliosis.

These findings provide new insights into the mechanobiology of GBM and astrocytes under HP and may contribute to the development of novel therapeutic strategies for neuro-oncology and CNS disorders involving ICP.