



UMD Department of Chemistry & Biochemistry
Spring 2022 Seminar Series
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Vascularization of Glioblastoma: Role of Cancer Stem Cells

Glioblastoma (GBM) is the most common primary brain tumor in humans, but even with the best treatment currently available, the prognosis is dismal. This difficulty in treating GBM is multifactorial, owing to both properties of brain tissue, as well as properties specific to GBM. One property of GBM that is of particular interest is the presence of cancer stem cells, which are thought to play a role in tumor recurrence and chemotherapy resistance. These stem cells are also thought to play a role in alternative tumor vascularization processes by adopting an endothelial cell-like phenotype to enhance tumor growth. This cancer stem cell to endothelial transition is the subject of the present research.

My hypothesis is that an established protocol to differentiate pluripotent stem cells into endothelial-like cells will induce a similar transition in the cancer stem cells. To test this, mouse glioma line GL261 cells were treated with growth factors as described in established protocols, and messenger RNA (mRNA) was extracted. This mRNA was reverse transcribed to complementary DNA (cDNA) for detection of endothelial-specific transcripts by quantitative PCR (qPCR) analysis. qPCR probes for endothelial markers Claudin 5 and P-glycoprotein were used to measure changes in expression relative to cells grown without growth factors. If the increased expression is observed in mouse cells, a future experiment using human GBM samples is planned using probes for additional endothelial marker genes.