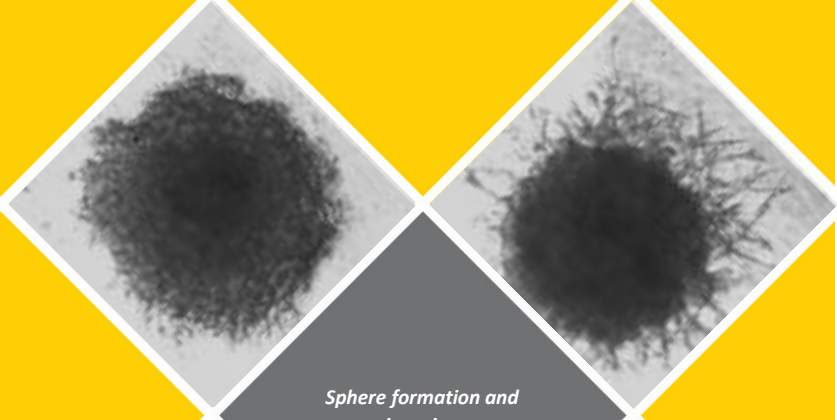
Cancer

GLIOBLASTOMA



Sphere formation and invasion

Background

Glioblastoma multiforme (GBM) is a IV grade astrocytoma, a highly malignant and aggressive primary brain tumor. Despite progress in clinical therapies and the understanding of molecular mechanisms underlying GBM pathogenesis, the prognosis of this tumor remains unknown. Currently, anti-neoplastic treatment combines chemotherapy, temozolomide (TMZ), radiotherapy and resectional surgery . Despite its frontline status, GBM patients commonly exhibit resistance to TMZ treatment. The identification of tumor cells with stem-like traits from human glioblastoma tissues and cell lines reveals a new and promising therapeutic target against GBM. This cell type, called glioblastoma stem cells (GSCs), is considered playing a critical role in GBM initiation, progression, and recurrence.

Pathology Model

Human glioblastoma cells will be cultured in presence or absence of CLIENT's compounds. After treatment with the compounds, cells will be cultured in a specialized Spheroid Formation ECM to drive spheroid formation of cells. Upon completion of spheroid formation, the spheroid is embedded in an invasion matrix composed of basement membrane proteins. This matrix forms a hydrogel network on which invasive cells can travel. This model of 3D spheroid culture will allow to evaluate the CLIENT's compounds effect on spheroid formation (index of tumour growth) and invasion (index of metastatic potential).

Readouts

The following parameters will be evaluated:

Step 1 - Sphere formation and invasion

- Quantification of size of neurospheres as index of tumour formation
- Quantification of cell invasion by image analysis software

Step 2 - GSCs characterization after sphere disgregation

FACS analysis for GSCs markers (CD133 and nestin)