NEURIX
Next generation neuro-engineering

BlastomaBrain™

Glioblastoma Invasion Model

Human brain-tumor organoid model

Advantages of BlastomaBrain™

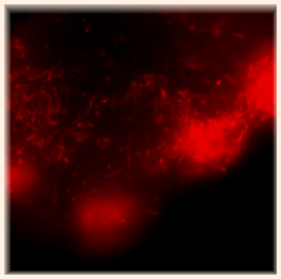
Glioblastoma invasion model

Short & Long term compound testing

Human 3-dimension tissues

Highly physiological tumor - brain organoid interactions

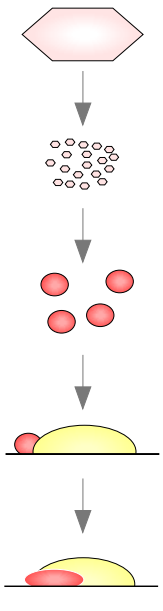
Monitoring of tumor dispersion and metastatis



BlastomaBrain™ is a drug testing service to investigate the efficiency of compounds against brain tumor. It allows to study glioblastoma in its natural environment, namely healthy human neural tissue. Thus, responses to drugs are also likely to be closer to reality.

We transduce human glioblastoma cells to overexpress a fluorescent reporter, and generate tumor spheroids.

These are inoculated on our 3-dimensional neural tissue derived from human pluripotent stem cells. Tumor growth is monitored via measuement of the fluorescent signal.



1) Isolation of glioblastoma from human patient

2) Dissociation & transduction for fluorescent reporter expression

3) Generation of fluorescent glioblastoma organoids

4) Inoculation on 3D neural tissue

5) Tumor growth and measurements

The long term compound testing, 3D human organoids and physiological neural-tumor interactions makes BlastomaBrain™ advantageous compared to currently used 2D & 3D tumor cells as well as animal models.

BlastomaBrain™ represents an ideal tool for lead compound screening and validation through efficiency testing, or deeper histological, proteomic and genomic testing for mechanistic studies.

Glioblastoma spreads among neural tissue

The fluorescent glioblastoma grows rapidly inside the neural tissue. Semi-automatic quantification is applied to measure tumor area, in parallel we do monitor tumor dispersion and metastasis.

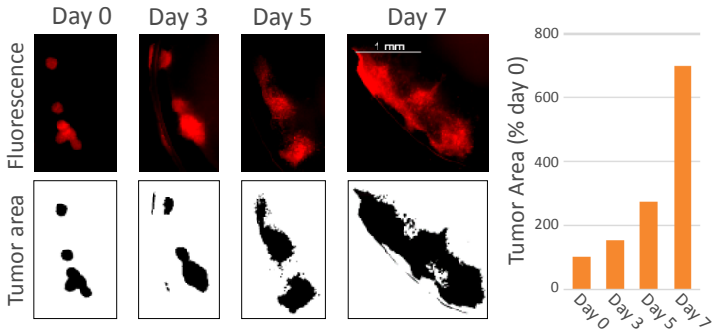


Fig. A: Topview of glioblastoma growth in the neural tissue 0-7 days post-inoculation. Fluorescence tumor imaging on the uper panel is quantified in a semi-automatized manner to obtain glioblastoma's area in bottom and right panel.

Semi-automatized quantification and histological readouts

Semi-automatic quantification revealed that the anti-cancer drug Temozolomide strongly affects glioblastoma growth. Our absolute IC50 of 258uM is comparable to litterature data. Alternative histologic, proteomic or genomic readouts can also be performed

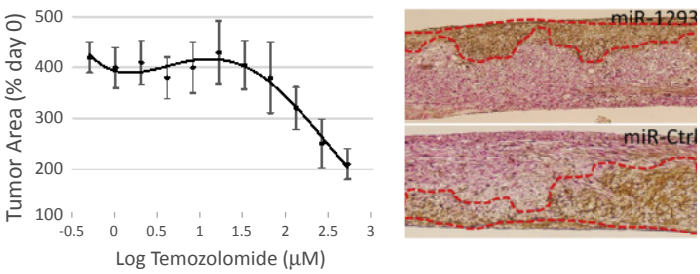


Fig. B: Left panel shows semi-automatized quantification of tumor area following Temozolomide treatment for 7 days (3 replicates). Alternative histological readout can be performed to vizualize tumor growth altered by miR-1293 micro-RNA on the right panel (Vimentin IHC, braun colored).

BlastomaBrain^{TM} Glioblastoma Invasion Model - Service specifications	
Cell types	**- Tumor:** Spheroids from continuous and patient-derived human glioblastoma cells, inoculated on the 3D neural tissue described below. - **3D Neural tissue:** Minibrain^{TM} generated from human pluripotent stem cells. Composed of neurons, astrocytes, oligodendrocytes and neural progenitor cells. The latter cells keep generating newborn neurons in a dynamic process.
Production technology	Neurix's Minibrain^{TM} & Neurosphere technology with minimum batch to batch variability guaranteed by extensive quality control of identity (rt-qPCR)
Field of application	Lead compound validation
Assay window	Short term (7 days) to long term (one month)
Readouts	- Tumor area (growth and motility) - Total fluorescence (growth) - Maximum radius (motility) - Number of secondary loci / metastasis (motility) - Therapeutic window between tumor killing and toxicity on neural tissue

Our publications

Cosset, E. et al. Human tissue engineering allows the identification of active miRNA regulators of glioblastoma aggressiveness. Biomaterials 107, 74–87 (2016).

Nayernia, Z. et al. The relationship between brain tumor cell invasion of engineered neural tissues and in vivo features of glioblastoma. Biomaterials 34, 8279–8290 (2013)

Validated assay and protocols

BlastomaBrain^{TM} service is integrated into a variety of validated assay that can be implemented in drug development for efficacy evaluation of novel compounds:

- Cell viability assays
- Histological analysis (IHC & IF)
- Cell sorting and cell population analysis (FACS)
- Genomic analysis
- Proteomic analysis

Get in contact with us

Neurix offers customized services for neural applications. These include gene / cell / polymer therapy testing, brain tumor drug testing, neurodegenerative diseases modeling and neurotoxicity assays. Our experienced scientists are happy to work with you in order to understand your needs and meet your objectives.

Contact us

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