

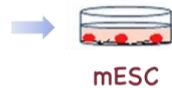
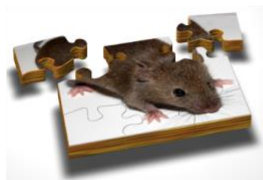


INFRAFRONTIER Complex *In Vitro* Models: 3D co-culture GBM Model

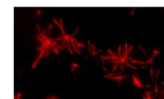
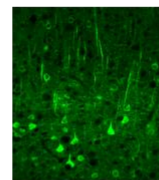
Brief description:

This model comprises a three-dimensional co-culture of astrocytes and neurons, differentiated from mESCs derived from selected mouse mutants, grown on a solid polystyrene scaffold populated with GBM cells of either mouse or human origin. It is specifically designed to accelerate preclinical drug discovery by enabling precise analysis of tumor growth, migration, and invasion in a physiologically relevant setting. The platform supports a wide range of readouts, from cell-cell adhesion assays and immunofluorescence to advanced secretome profiling by mass spectrometry. It also enables real-time cell viability monitoring with fluorescent live/dead staining, quantitative 3D proliferation analysis using AlamarBlue, and high-resolution imaging of invasive behavior by multiphoton confocal microscopy. Together, these features provide a versatile and information-rich system for generating robust multiparametric datasets across multiple endpoints, without the need for model switching.

Mutant Mouse strain

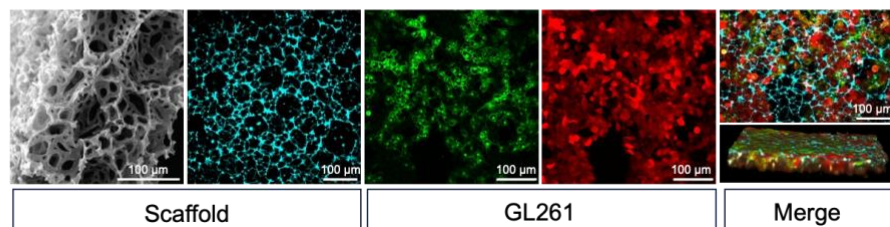


mESC



Differentiated cells

3D glioma cells growth within Alvetex Scaffold





How is the model generated?

1. mESC generation and validation from selected mouse mutant
2. differentiated cell generation from mESC and validation
3. 3D co-culture of differentiated cells mixed with GBM cells in the polystyrene scaffold

Potential applications:

CIVM use: This 3D co-culture model offers a comprehensive platform to study glioblastoma invasion, tumor-associated neurotoxicity, and the efficacy of novel therapeutics. Moving beyond conventional cell-killing assays, it provides a dynamic, high-resolution view of tumor interactions with the brain's cellular architecture.

By integrating mass spectrometry, advanced imaging, and quantitative viability assays, the model enables generation of robust multiparametric datasets that support preclinical drug discovery and deepen our understanding of the mechanisms driving brain cancer progression.

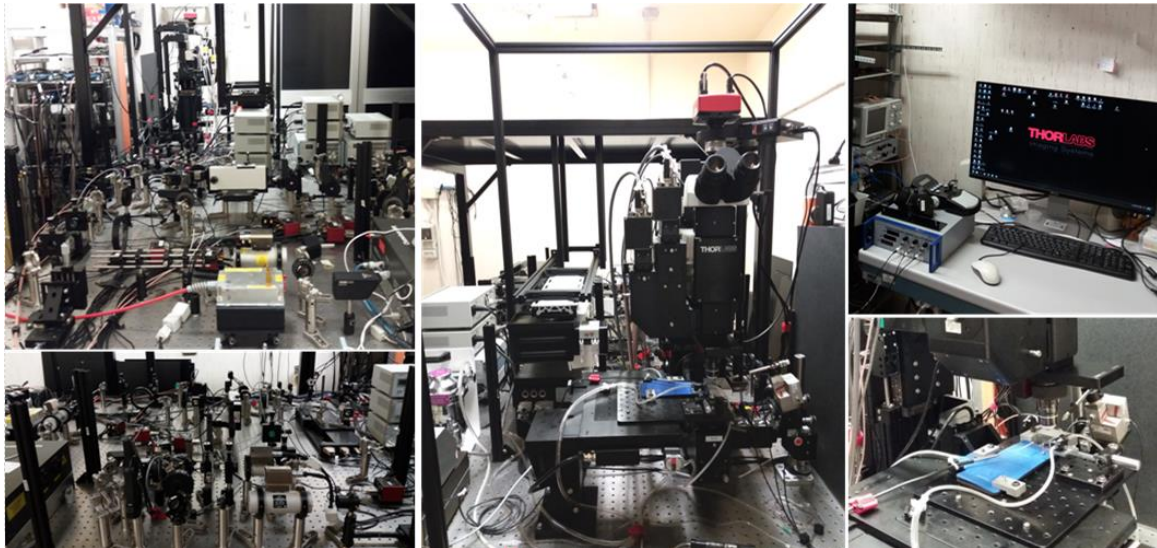
Who provides this model?



The model is supported by a laboratory equipped with dedicated molecular biology and biochemistry workstations, P2 biosafety tissue culture rooms, and shared research spaces. The institute further contributes a broad range of advanced core facilities, including genomics and molecular biology platforms, flow cytometry and cell sorting, confocal and advanced imaging systems such as two-photon intravital microscopy, real-time PCR and sequencing, and infrastructure for tissue culture and 3D model development.



IBBC also hosts the Italian node of the INFRAFRONTIER Research Infrastructure, providing access to collections of mutant models, associated data resources, and experimental platforms for studying genome function in health and disease. Through the INFRAFRONTIER-European Mouse Mutant Archive (EMMA), a world-leading repository, mutant models are archived and distributed to the scientific community. In addition, dedicated INFRAFRONTIER mouse clinics support whole-organism analysis of genotype-phenotype interactions, enabling both investigator-driven studies and large-scale international initiatives such as the International Mouse Phenotyping Consortium (IMPC).



Contact:

Fabio Mammano - fabio.mammano@cnr.it

Daniela Marazziti - daniela.marazziti@cnr.it

Chiara Di Pietro - chiara.dipietro@cnr.it



References:

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[INFRAFRONTIER, the European Research Infrastructure for Modelling Human Diseases](#), is a non-profit organisation dedicated to advancing disease understanding and treatment through cutting-edge models. Operated by a [network of over 20 leading biomedical research institutes](#), it empowers research on human health and disease. Committed to excellence, INFRAFRONTIER adheres to rigorous scientific benchmarks and prioritises animal welfare. Through [collaboration with other infrastructures](#), it fosters global data sharing and contributes to tackling significant health challenges. INFRAFRONTIER serves as a platform for innovative technologies and knowledge exchange, leveraging the power of disease modelling to improve human health.