IVRS
IN VIVO RESEARCH SERVICES

GLIOBLASTOMA MOUSE MODEL

Glioblastoma (GBM) is the most aggressive and common primary tumour, with an overall survival of only 15 months from diagnosis. The diversity of progenitor cells, the high probability of metastasis, and the high resistance to medication make it one of most complex cancers to treat. To better understand the biology of GBM tumours and improve the current therapeutic efforts, preclinical research is urgently needed. Here we provide a clinically relevant platform for the study of GBM and to explore the efficacy of potential therapeutic agents via in vivo imaging.

DISEASE PLATFORM

We are able to implement clinically relevant models of GBM by using orthotopic transplantation of either patient-derived or cell line-derived xenografts expressing firefly luciferase. In vitro bioluminiscence correlates strongly with the number of tumour cells **(Figure 1A).** This is a suitable way to monitor tumour growth in our orthotopic GBM model, which is robust and non-invasive **(Figure 1B-C)**. The combination of Bioluminiscence Imaging (BLI) and CT scan allows us to determine the topography of the tumour and estimate its invasiveness to other areas of the brain **(Figure 1D)**.

A wide spectrum of near-infrared fluorescent probes can be used in combination with BLI to study different biological aspects of the brain tumour (e.g. angiogenesis, apoptosis, metabolism and hypoxia) with a high spatial and temporal resolution. Morevover, we are able to deliver drugs intratumourally/intracerebrally to validate the efficacy of potential therapeutic agents.

EXPERIMENTAL OUTLINE

The number of cells adjusted to a total volume of 2-5uL of PBS + 30% Matrigel will be delivered stereotactically into the striatum **(Figure 1B)**. The tumour progression will be monitored by in vivo BLI every week **(Figure 1C)** for a period of 8-10 weeks post-inoculation.

SEGMENT MODEL SPECIFICS	
Animals	• 8-10 weeks old mice
Cells	• PDX/CDX cells expressing Red F-Luc (firefly luciferase) and GFP/RFP • Mouse allografts
Tumour uptake	• 3-7 days after transplantation.
Treatment Initiation	• 1-2 weeks after transplantation.
Duration of the study	• 8-10 weeks for primary tumours. Metastasis is expected within longer periods.
Type of monitoring	• Quantitive 2D bioluminescence imaging. • 3D imaging + CT scan for topological identification of the tumour. • Behavioural evaluation (locomotion, cognitive failure). • Sampling of blood or CSF for ELISA and other analyses. • Isolation of tumours and histology. • Molecular analysis e.g, pathway analysis, FACS, and co-culture studies

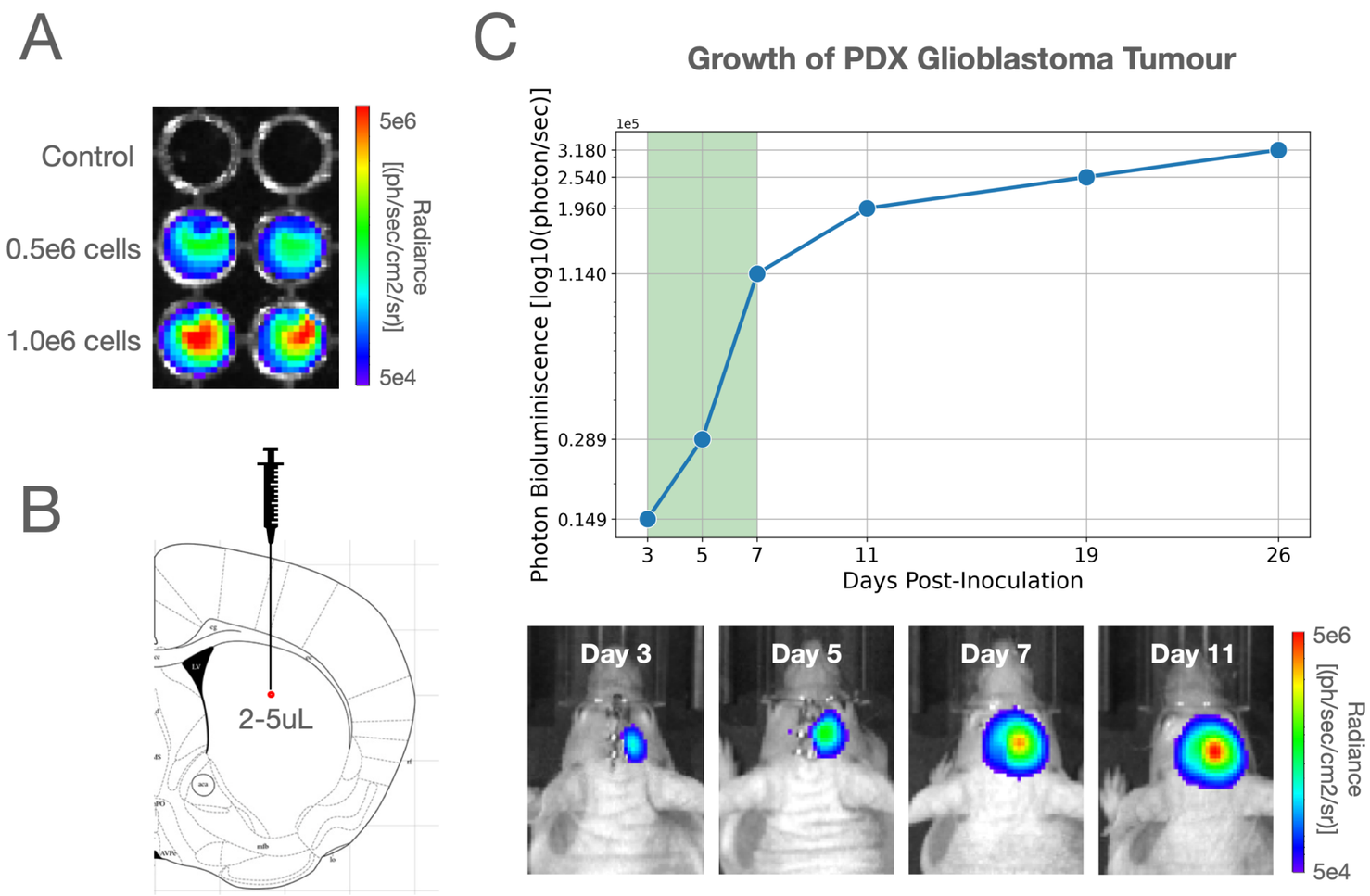

Figure 1. Orthotopic Glioblastoma Mouse Model. Using Nude mice, we have established an in vivo model of GBM suitable for drug screening and preclinical validation. **A.** In vitro assay of bioluminiscence from GBM cells in function of the cell number in suspension. **B.** Cells were suspended in a volume of 2-5 uL and injected orthotopically into the mouse striatum (AP: 0.5, ML: 1.8, DV: 3.2mm from Bregma). **C.** In vivo monitoring of GBM tumour progression. Top panel: Average photon radiance throughout the study, highlighting the tumour uptake period (green area). Bottom panel: representative BLI at specific time points. **D.** 3D BLI overlapped with CT scan of the mouse shown in C.

LET'S SPARK A DIALOGUE!

Contact: info@ivrs.se — +46 793 17 21 17
Scheeletorget 1, 22363 Lund, Sweden
www.ivrs.se /ivrs-ab