

**MRI-guided Focused  
Ultrasound robotic  
system for brain tumors.**



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RECOVERY AND RESILIENCE PLAN



# BRAINSONIC

**ENTERPRISES/0223/SUB-CALL1/0057**

**NEWSLETTER**

**INDEX**

**Project Objectives  
Consortium Partners**



**BRAINSONIC**



## PROJECT OBJECTIVES

**Robotic system:** The main goal of BRAINSONIC is to develop a **Magnetic Resonance-guided Focused Ultrasound (MRgFUS) robotic system** for the non-invasive extracorporeal treatment of brain tumors. The positioning device will feature four degrees of freedom (4-DOF) to manipulate a single-element spherically focused transducer. This system will integrate seamlessly with the Magnetic Resonance Imaging (MRI) scanner to facilitate lateral ultrasonic delivery in supine patients.

**Therapeutic Protocol:** The **first role of MRgFUS will be to replace surgery**. A small portion of the skull above the tumors will be temporarily replaced with a 1 mm thick biocompatible 3D-printed plastic to achieve the necessary acoustic levels for tumor necrosis. In case a tumor recurs; therapy can be repeated. The **second role of MRgFUS will be to open the Blood brain barrier (BBB)**, enabling the delivery of killer drugs to the tumor. Tissue heating will be accurately monitored by MR thermometry.

## CONSORTIUM PARTNERS

The project is coordinated by **LINAC-PET SCAN OPCO LTD**, an SME affiliated with the German Medical Institute in Cyprus, with extensive expertise in oncology and MRI imaging. LINAC aims to pioneer novel medical devices, leveraging its clinical experience to optimize the BRAINSONIC prototype system for clinical practice. **Cyprus University of Technology (CUT)** participates as an academic partner through the Laboratory of Therapeutic Ultrasound, providing technical and scientific expertise in designing MRI-compatible robotics for FUS applications.

The project started on February 15, 2024, and will run for 2 years. It is funded by the Research and Innovation foundation under the call ENTERPRISES/0223/SUB-CALL1.