



Project: gECoG (ICN2, InBrain Technologies)

gECoG

gECoG - Scaling of a graphene electrode array for brain surgery mapping.

The gECoG project is focused on the scaling of a graphene electrode array for use in medical/clinical applications where it is necessary to monitor the brain activity on the surface of the cortex. The device to be scaled is a flexible array of graphene microelectrodes (64 and 128 electrodes) for electrocorticography measurements (ECoG) that are performed during the course of invasive surgeries in the brain, such as those related to the resection of brain tumors or of epileptic focus.

ICN2 and INBRAIN Neuroelectronics (a spin-off participated by ICN2) are working with the objective of increasing the TRL of new invasive implants based on graphene, advancing from the current stage of a preclinical prototype for use in animals towards clinical prototypes of Class III medical devices.

The gECoG project will develop the following activities:

A.1. Technology scaling. Development of microfabrication processes compatible with the dimensions and future use of implants in humans. Aspects such as the control of the mechanical flexibility of the substrate and the homogeneity and performance of the technology will be developed within the framework of the project.

A.2. Evaluation of the technology and assembly of the final prototype. The main objectives are: i) to evaluate the functionality of the new technology in small animal models, ii) to generate sufficient data on the safety and biocompatibility of the technology, iii) to validate sterilization procedures, and iv) assembly of the final prototype compatible with existing medical electronic equipment.

A.3. Regulatory validation and preparation of clinical trial. This activity includes i) the preparation of the required documentation to obtain approval from regulatory agencies and ii) performing functional tests on animal models relevant to the clinical trial.