Título del Proyecto	**MagnetoElectric and Ultrasonic Technology for Advanced BRAIN modulation (META-BRAIN)**
Nº de expediente asignado	101130650
Abstract	The pathological alterations of neurological function (e.g., stroke, trauma, neurodegeneration, epilepsy, neuropsychiatric diseases, chronic pain) are commonly associated with alterations in brain rhythms and activity patterns. There is an urgent clinical need for treatments that can precisely control and restore neural activity, taking advantage of state-of-the-art technological developments in a variety of fields including nanotechnology, nano- and microelectronics, novel materials, brain science, clinical neurology, and computational modelling. META-BRAIN (MagnetoElectric and Ultrasonic Technology for Advanced BRAIN modulation) brings together seven expert partners in these fields with the aim of achieving precise spatiotemporal control of brain activity using magnetoelectric nanoarchitectures that can be polarized by non-invasive, remote magnetic fields. This novel principle of brain activity control will minimize the amplitude of the required magnetic fields, be wireless, and have enhanced spatial resolution from single neurons to cortical areas. We will develop a model-driven fabrication of the coils and monitor the effects on brain function with arrays of graphene micro-transistors that uniquely allow full-band recording, integrating all elements in a closed loop. As an alternative to remote brain stimulation we will also use novel ultrasonic technologies. The META-BRAIN control paradigm will be systematically studied in preclinical systems from individual neurons to the full brain. All developments and experiments will be carried out in conjunction with theoretical models that will simulate, quantify, and predict optimal arrangements and patterns for the desired output. Translation to humans will be evaluated with our clinical partners, and a detailed dissemination and exploitation plan will be developed by two expert

	company partners, one of which has extensive expertise in the fabrication of brain interface devices with a worldwide distribution capability.
Entidad Financiadora	European Innovation Council. EIC.
Convocatoria:	HORIZON-EIC-2023-PATHFINDEROPEN-01
Importe de la ayuda	362.610,00 €
Fechas de ejecución del proyecto	01/01/2024 - 31/12/2026
	European Innovation Council   **Funded by the European Union**
Enlaces:	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2023-pathfinderopen-01-01