eatris
European infrastructure
for translational medicine

EIC Pathfinder Challenge – Tools to measure and stimulate activity in brain tissue

Medical devices to measure and stimulate brain activity are emerging as tremendously powerful therapeutic tools that could revolutionise the treatment of brain diseases. Yet today's state-of-the art microelectronics and microfabrication are potentially conducive to novel neuro-devices with high levels of miniaturisation, ultra-low power consumption, multi-site sensor/stimulator arrays (linear, planar or 3D with a wealth of geometries) and wireless architectures, leading to lower risk, shorter recovery times and better patient acceptance. Further, progress can also be achieved by the discovery of new physical principles for activity monitoring (invasive or non-invasive) and activity modulation. These could explore ultrasound, light (optogenetics or otherwise), mechanical stimulation, local release of neuroactive compounds, ionising radiation, etc. It is the right time to explore these opportunities and develop novel neurodevices that can be rapidly accepted by clinicians and patients.

Overview of EATRIS institutions' expertise

- Animal models for brain diseases
- Radiomics
- Optogenetics
- Neuroimaging (MRI/PET/CT)
- Ultrasound methods
- Optical methods
- Electrophysiology (patch recording, MEG and EEG, recordings from cell cultures, brain slices)
- Brain sensing and/or stimulation technologies (deep brain stimulation)
- AI methods (machine learning/deep learning)
- Data analysis centres manage the processing and integration of multi- modality data.
- Regulatory services

If you are looking for partners for your EIC consortium, we invite you to make use of EATRIS Consortium-building service and submit your request here. Within a few business days, we will provide you with a list of matches found among EATRIS 114 member research institutions along with their contact information.