

Centre for Biomedical Technology

The Centre for Biomedical Technology (CTB) is a research and technology centre of Universidad Politécnica de Madrid that brings together researchers from different disciplines on biomedical technologies, in collaboration with other external institutions.

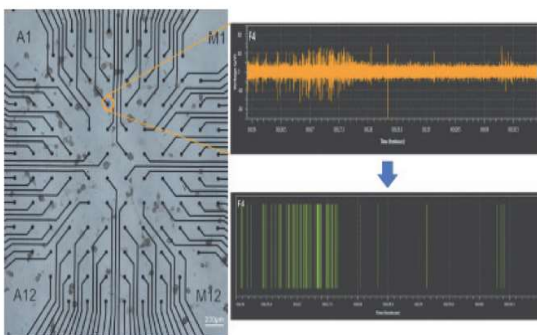
Our mission is aimed to address major challenges that scientists are facing today in Biomedicine and Health and whose success requires a stable and interdisciplinary collaboration, including both basic and translational research.

Facilities and infrastructures



Magnetoencephalography (MEG) is a technique that records functional brain activity by capturing the magnetic fields produced during the neuronal synapse and which are projected abroad.

Microelectrode array recording system (MEA 2100 from Multichannel Systems) allows the simultaneous recording of extra-cellular field potentials generated by cell populations or tissues *in vitro*, and the analysis of the physiological or pathological functionality of neuronal or cardiac circuits with high spatial and temporary resolution.

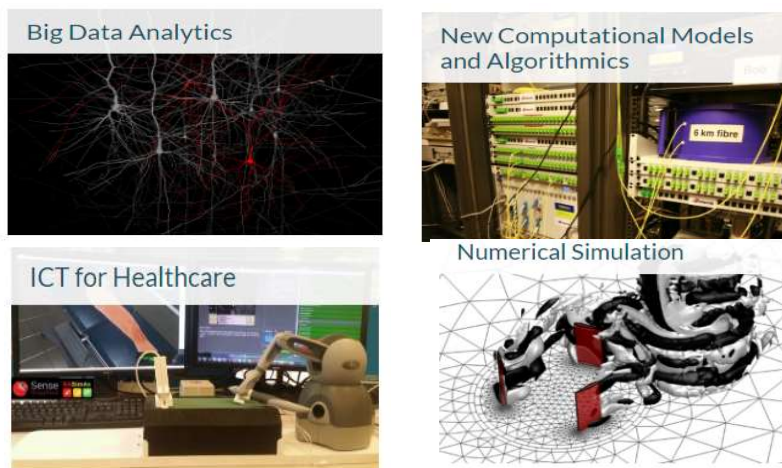


Animal house, an important core of the Center for the breeding and maintenance of different species of rodents giving support to the research activity of groups working with preclinical models. The unit is a conventional module separated into several areas: quarantine room, surgery room, two rooms for rodents housing and a warehouse for feed store.



Cell culture laboratorios (BSL1 y BSL2) containing four Class II Biological safety cabinets, five CO2 incubators Thermo Scientific, microscopes, bench and desk spaces, inverted microscopes, refrigerated centrifuges, -80°C Ultralow temperature freezers and a microscopy room containing a fluorescence microscope and a microtome. These laboratories have been approved as biosafety level 1 and 2 labs by the local authorities, which allows to work with non-human cells and human cells, respectively.

Research areas associated with Big Science



Main projects in Big Science

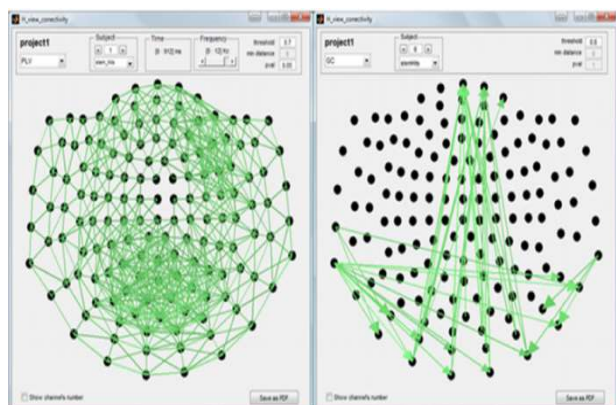
- **Human Connectome Project:** *Connectomics of Brain Aging and Dementia.*
- **REMEMBEREX:** *Human Subcortical-Cortical Circuit Dynamics for Remembering the Exceptional.*
- **Human Brain Project, SGA2 (HBP-SP1).**
- **ALLERSCREENING:** *Point-of-care device based on KETs for diagnosis of food allergies. – H2020-2017-768641.*
- **EMERGE:** *Evaluating mHealth technology in HIV to improve Empowerment and healthcare utilization: Research and innovation to Generate Evidence for personalized care.*
- **Cancer Long Survivors Artificial Intelligence Follow Up. H2020 (RIA).**

Collaboration with Large European Scientific Facilities

- **ESA Climate Change Initiative. European Space Agency.**
- **CROSS CPP:** *Ecosystem for Services based on integrated Cross-sectorial Data Streams from multiple Cyber Physical Products and Open Data Sources. CORDIS ref.:780167.*
- **BDVe: Big Data Value ecosystem. CORDIS ref.:732630.**

Software, tools or licenses to be applied to Big Science

- **HERMES Toolkit** (open software free available at <http://hermes.ctb.upm.es>), an advanced Platform for the analysis of encephalographic time series, which provides a variety of multivariate and non-linear analysis methods to characterize functional connectivity networks, both in the sensors and in the sources spaces.



UPM contact:
Gustavo V. Guinea Tortuero
gustavovictor.guinea@ctb.upm.es