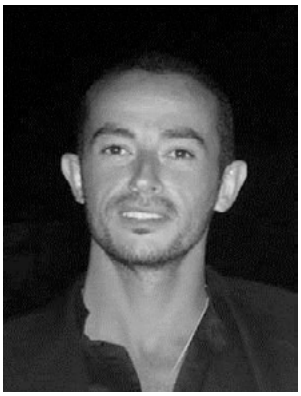
BRAINOMICS

Nanoporous silicium for molecular fingerprinting in neurodegenerative disorders



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Partner countries: France, Israel, Sweden

With the increase of life expectancy and the growth of aging populations in Western countries, neurodegenerative motor diseases will constitute a major public health challenge in the coming decades. Currently affecting some 7 million people worldwide, Parkinson's disease (PD) is principally characterized by the progressive and massive degeneration of dopaminergic neurons in substantia nigra pars compacta (SNc).
To date PD is still incurable. Chemical and/or surgical symptomatic treatments are employed to alleviate the motoric symptoms (tremors, rigidity and akinesia), but do not address the disease itself. The underlying molecular events associated with PD's neuropathology remain poorly documented, since this requires accessibility to the pathological tissues. Deleterious consequences of tissue lesion in highly functional brain regions prohibit the performance of biopsies, thus restricting molecular analysis to post-mortem samples alone. Deep brain stimulation (DBS) remains the only nonlesional approach to explore various brain nuclei, and it uniquely offers temporary access to the pathological tissue in awake patients, at earlier stages of disease.
Taking advantage of DBS surgery, Brainomics proposes to develop a dedicated device, based on nanoporous surfaces directly applied to the surgical instruments, to perform a nonlesional fingerprinting of brain tissue. The availability of fresh brain tissue for extensive genomic and proteomic studies will enable the deciphering of key molecular mechanisms and the identification of potential biomarkers of this complex neurodegenerative disease.

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