

NEWSLETTER 1

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The ERA-Net Scheme

The **ERA-Net** Scheme is supported by the European Commission and it aims to contribute to a reality of a European Research Area (ERA) by improving the coherence and coordination across Europe of national research programs. In the framework of the **ERA-Net** Scheme national systems are collectively able to take on tasks that they would not have been able to tackle independently. Nowadays around 80 different **ERA-Nets** are operating with a wide range of topics included in their frameworks.

ERA-Net NEURON



ERA-Net **NEURON** was launched in January 2007 and is funded under the ERA-Net scheme in FP6 by the European Commission. The aim of **NEURON** is to promote the development of a European strategy for research in the area of disease related neuroscience.

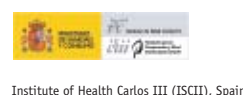
Among the many diseases affecting human health, disorders of the brain are major causes of morbidity, mortality and impaired quality of life. According to estimates by the World Health Organization (World Health Report 2001), more than one billion people suffer from disorders of the central nervous system. In Europe, disorders of the brain account for approximately one-third of the total burden of all diseases.

The project envisages creating a group of relevant research funding organizations in Europe and, thereby, gain maximum added value from investment in this field. Fifteen European national research funding programs and funding activities from Austria, Finland, France, Germany, Italy, Israel, Luxemburg, Poland, Romania, Spain, Sweden and UK are cooperating under this single umbrella.

Multinational calls for research applications

In January 2008, the **NEURON** Consortium launched its first joint call for transnational research projects on neurodegenerative diseases, to which 59 applications were received. Funding of the selected projects is planned for the beginning of 2009. A second joint transnational call will be open for new applications in 2009.

More information: www.neuron-eranet.eu



Scientific workshops

NEURON organizes workshops on various issues in the scope of its activity. The first workshop was held in Paris (October 15th, 2007) and focused on neurodegeneration. Following is a summary of the workshop presentations.

"Neurodegeneration": State of the art and future orientations

Neurodegenerative diseases are conditions in which cells of the central nervous system (CNS) die. CNS neurons are not readily regenerated, so excessive damage can be devastating. The best known neurodegenerative diseases include Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis, Lewy body dementia and multiple system atrophy. Huntington chorea is a hereditary disease, whereas Prion diseases are transmitted by faulty proteins. Another infection-related condition which includes neurodegeneration is HIV-associated dementia.

Brain damage can result from stroke, heat stress, trauma, infections, neuroinflammation, and genetic disorders. Hereditary neurodegenerative diseases can provide models for understanding related non-genetic diseases.

One common aspect of neurodegenerative diseases is the paucity of available treatments. Consequently, research is highly invested in stem cell treatments, as well as in gene therapy. Attempts to identify bio-markers for neurodegenerative diseases are also crucial in order to enable treatment prior to the onset of symptoms.

"Loss of IGF-I input as a common cause of neurodegeneration"

Professor Alemán underscored the role of the circulating trophic factor IGF-I in aging and late onset neurodegenerative diseases. In Purkinje cell degeneration (PCD) mice, elevating IGF-I levels in the brain improves coordination, neuroprotection and neurogenesis. IGF-I could also have a crucial role in Alzheimer's disease since it can promote Amyloid-beta clearance from brain, and inhibiting IGF-I produces an Alzheimer-like neuropathology. Finally, in the elderly, the cognitive status is negatively correlated with serum IGF-I levels.

Prof. Ignacio Torres Alemán

Spain



"Microglia activation in neurodegeneration (injury and disease): signalling phagocytosis"

Microglia, the "brain macrophages", reach the CNS early in embryogenesis where they reside normally as a self sustained non-activated population. Activated microglia can be detrimental or beneficial. Microglia that are activated by inflammatory signals or products of neurodegeneration can secrete neurotoxic factors that induce and/or further enhance neuronal damage. However, activated microglia may also be beneficial. One notable example is phagocytosis of degenerated myelin, which is important for axon regeneration and in multiple sclerosis. The balance between detrimental and beneficial functions of microglia is complex and poorly understood. The expression of Galectin-3/Mac-2 in microglia plays a pivotal role in activating phagocytosis in these cells.

Prof. Shlomo Rotshenker

Israel



"Alzheimer's disease"

Alzheimer's disease is a leading cause of dementia, and is characterized by extracellular senile plaques containing Amyloid-beta and lipids, and by intracellular neurofibrillary tangles comprising the cytoskeleton protein Tau. The physiological function of A-beta or of its precursor APP, is still unknown. However, studies on transgenic mice expressing mutated human APP or human Tau, normal or mutated, support the idea that neurodegenerative diseases such as AD are not primarily due to neuronal death, but instead result from abnormal accumulation of proteins in the brain.

Prof. Charles Duyckaerts

France



"Keeping Europe in the mainstream of the fight against Alzheimer's: the search for disease markers"

Valid markers for AD are important for understanding and treating this condition, but have yet to be identified. In the USA, the ADNI project (Alzheimer's Disease Neuroimaging Initiative) is aimed at validating prospective markers. In Europe, two projects are trying to import the ADNI methods. Both are coordinated by the Italian National Centre for Alzheimer Disease and capitalize on the European Alzheimer Disease Consortium. ADNI is bound to become the international standard, and Europe should take up the ADNI platform on a large scale and use it to search for novel disease markers.

Prof. Giovanni Frisoni

Italy

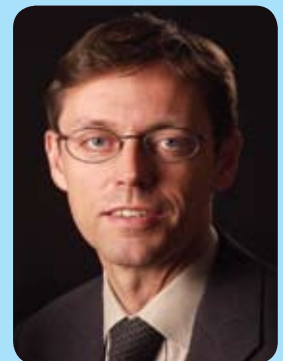


Parkinson's disease and genetics

Loss of dopaminergic neurons in Parkinson's disease occurs well before any symptoms are detected. Therefore, markers for this pre-symptomatic phase are sought for. PD is mainly sporadic, but 10% of the cases are genetic. Genes linked to the disease include the alpha-synuclein and the LRRK2 genes. LRRK2 is the most common PD-gene discovered so far and it induces a pathology which is very similar to sporadic PD. It could represent a useful model since changes in metabolic activity and in the dopamine transporter can be detected in the pre-symptomatic phase in LRRK2 patients.

Prof. Thomas Gasser

Germany



"Parkinson's disease: models and mechanisms for identification of treatment targets and compounds"

There are three major challenges for treating PD:

- Identifying treatments that slow the progression of the disease.
- Identifying treatments that restore neuronal function.
- A rapid translation of preclinical results into clinical studies.

Therapeutic strategies should primarily prevent aggregation of alpha-synuclein in dopaminergic PD neurons. Genetic screens for potential interactors of alpha-synuclein aggregation and toxicity can be performed using an in vivo RNAi transgenic drosophila library or chemical libraries containing compounds that have been used clinically for other indications.

Prof. Jörg Schulz

Germany



"Parkinson Syndrome and other movement disorders"

Movement disorders include Parkinson disease, dementia with Lewy body (DLB), multiple system atrophy (MSA), progressive supranuclear palsy (PSP) and others, and diagnosis can often be difficult.

Generally, the above listed disorders are characterized by abnormal aggregation of alpha-synuclein and/or Tau. In addition, many movement disorders are intimately linked to dementia and to sleep disorders such as the REM sleep behaviour disorder (RBD) or narcolepsy. Thus, patients with sleep disorders might help to identify predictive and diagnostic markers for PD.

Prof. Wolfgang Oertel

Germany



"Deep brain stimulation for movement disorders: state of the art and future needs"

Deep brain stimulation (DBS) is a form of stereotaxic surgery for the management of advanced PD and other movement disorders. The method involves implantation of a brain pacemaker, which sends electrical impulses and interferes with neuronal activity at the target site. Although DBS is effective, and important for the study of the basal ganglia, its underlying mechanisms are not clear. Four hypotheses currently exist to explain the mechanisms of DBS: depolarization blockade, synaptic inhibition, synaptic depression, and stimulation-induced modulation of pathologic network activity. Research therefore focuses on understanding the underlying mechanisms, as well as establishing the optimal targets for DBS and extending its indications.

Prof. Jens Volkmann

Germany



More Scientific workshops

A workshop on ***"Future perspectives, benefits, bottlenecks and costs of Neuro-biobanks"*** was organized by **NEURON** in Vienna (April 2008).

A summary will be published in the next newsletter.

A workshop entitled: ***"Frontiers in neurosciences and prospects for their funding in Europe"*** will be held in July 11, 2008, as a Satellite Symposium to the coming FENS meeting.

Additional workshops, aimed at foreseeing future orientations and needs of Neurosciences are planned by **ERA-Net NEURON**, in which recommendations on possible topics for future calls for research applications will be formulated.