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## Consortium

The INMiND consortium is a unique interdisciplinary research consortium established by 28 complementary partners with leadership expertise in various fields (basic, translational, reverse-translational and clinical neuroscience and molecular neuroimaging; development of cellular and animal models, tracers and contrast agents; image validation, quantification and theranostics) including 6 SMEs, from 12 European countries and Australia.



## Contact

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# INMiND

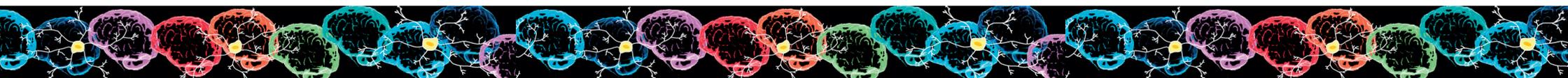
## Imaging of Neuroinflammation in Neurodegenerative Diseases



## Collaborative Project

GA 278850

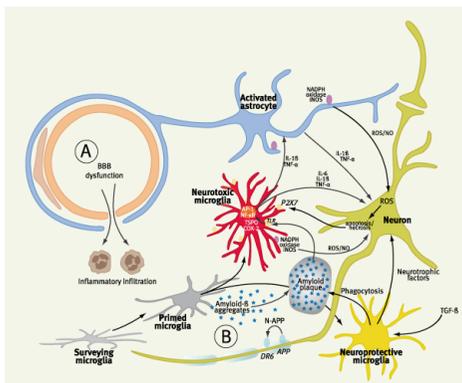
THEME HEALTH.2011.2.2.1-2  
Understanding the Role of Neuroinflammation  
in Neurodegenerative Diseases



## Context

Neurodegenerative diseases (ND) such as Alzheimer's (AD), Parkinson's (PD) or Huntington's Disease (HD), Amyotrophic Lateral Sclerosis (ALS) and Multiple Sclerosis (MS) are among the most common chronic neurological disorders with devastating consequences not only for patients and their families but also on a societal and socioeconomic level.

These diseases have in common that protein turn-over is impaired leading to deposition of extra- and/or intracellular protein aggregates, which induces recruitment and activation of immune system cells (activated microglia).



The 'Vicious Cycle' of neuroinflammation (Jacobs, Tavittian, INMiND consortium, *JCBFM* 2012;32:1393-1415).

These reactive microglia are involved in both inflammation-mediated neurotoxicity as well as neuroregenerative repair mechanisms, depending on disease stage and cell polarization status (M1 or M2 phenotype).

## Objectives

The INMiND project focuses on the study of molecular mechanisms of neuroinflammation in neurodegenerative diseases (NIND) with the aim to identify novel biomarkers for activated microglia for both diagnostic and therapeutic purposes.

A large part of the project's efforts are directed towards the following objectives:

- Identify novel mechanisms of regulation and function of microglia under inflammatory stimuli and in ND models
- Identify the interplay between microglial activation and neuroregeneration induced by neural stem cells
- Identify molecular targets for ND therapeutics and advanced imaging probes which bind to activated microglia and BMD cells
- Quantitatively assess dynamics of microglial activation in various ND models in conjunction with other disease specific imaging markers (e.g. neurotransmitter function) using standard and newly developed probes
- Translate new imaging paradigms for microglial activation into patients with various ND (AD, PD, HD, ALS) and multiple sclerosis (MS) with and without immunomodulatory therapies
- Validate protective strategies for neurons and axons for improved disease outcome
- Train a new generation of cross-disciplinary scientists in the field of NIND for biomedical research

## Training

INMiND offers research and training activities related to neuroinflammation, neurodegeneration/regeneration and imaging with special emphasis on translating basic mechanisms into clinical applications to support the creation of a new generation of highly trained researchers in Europe.

### Training courses:

- PET and SPECT radiopharmaceuticals development: biosynthetisch, preclinical evaluation, GMP and clinical dossier, NL
- Design, preparation and validation of MRI probes for diagnostic and therapeutic imaging, IT
- Assessment of microglial functions, basic culture and characterisation, DE
- Analysis of neural stem / progenitor cell proliferation and fate, AT
- PET tracer pharmacokinetics and data analysis procedures, NL
- Basic kinetic modeling in molecular imaging, DK
- Advances in neuropathology and neurobiology, UK
- Pharmaceutical technology and drug discovery, UK
- Animal models of neuroinflammation, ES
- Design and generation of reporter systems, IT
- Small animal MRI of the CNS, BE
- Mouse imaging academy, DE
- Small animal PET imaging, FR

All courses are not only exclusively open to INMiND members but also to all other researchers and professionals from public and private institutions. Please visit the INMiND homepage for more details.