Neurofibrillary Tangles  
ApoE Gel

Investigation of individuals neurofibrillary tangles in the brains of boxers gave rise to new legislation. For example, the identification of dopamine deficits in typical pathology of the dementia which bears his name. Neuropathology is still in its infancy 100 years ago. Charcot studied the brain pathology of Europe, BrainNet Europe will ensure that international experts from US and Europe.

**Purpose of BNE**

- To promote brain banking as a research resource for European neuroscience through the provision of a range of brain tissue samples.
- To optimise and harmonise methodology, leading to best practice guidelines for brain banking.
- To develop new research methodology applicable to human brain tissue.
- To provide training in brain banking and related methodology.
- To reach out to neuroscience centres worldwide and promote future expertise in Central Nervous System (CNS) research.

**HISTORY OF BRAIN BANKING IN EUROPE**

In the late 1400s, Leonardo Da Vinci was amongst the first scientists to explore the anatomy of the human brain and eventually he was banned by the Pope from conducting autopsies for several years, following accusations of necromancy. Despite Leonardo’s partial successes in efforts to preserve brain tissue, morphological understanding of diseases of the brain was still in its infancy 100 years ago. Charcot studied the pathology of Parkinson’s disease in 1869 and Lewy described the inclusion bodies named after him in 1912. At about the same time, Alzheimer reported the typical pathology of the dementia which bears his name. Neuropathology Departments developed in Europe as laboratory extensions of psychiatric hospitals and collections of post-mortem brains came into existence, known as brain banks. The benefits of study of these collections has become clear over the years. For example the identification of dopamine deficits in the brain stem in patients with Parkinson’s disease lead directly to the introduction of levodopa as a successful treatment and the detection of neurofibrillary tangles in the brains of boxers gave rise to new legislation.

**BRAIN BANKS LIE BEHIND MOST MAJOR ADVANCES IN CLINICAL NEUROSCIENCES**

The generalised decline in post-mortem examination in most countries has lead to a decline in brain donations to organ banks. There are always difficulties in obtaining brains from people with rare diseases in sufficient numbers for meaningful studies. Anon significant problem for most brain banks lies in collecting normal control brains from all age groups. One reason for brain banks to form networks is that they can then share knowledge and access to samples. Many brain banks have a long tradition of making tissue samples freely available to bonafide researchers. By spreading expertise across the brain banks of Europe, BrainNet Europe will ensure that brain tissue samples are stored optimally and are readily accessible to researchers.

Individual brain banks within the BNE consortium focus on different CNS disorders. Overall, samples are stored from neurodegenerative and prion diseases, Parkinson’s disease, HIV/AIDS, psychoses, movement disorders and motor neuron disease, multiple sclerosis, perinatal brains and from controls. The members possess a vast range of well-validated methodologies which include the full range of staining techniques, confocal and electron microscopy, image analysis, morphometry and stereology, neurochemistry, molecular biology and Western blots. Some but not all banks are expert in DNA and RNA extraction and analysis, 2D gel electrophoresis, PET blots, tissue microarray and proteomics.

The work of BrainNet Europe is organised in a number of packages for which individual BNE members take prime responsibility.

- Standardised clinical criteria
- Donor programme
- Tissue sampling and microsection
- Standardised biochemical staining protocols
- Standardised neuropathological diagnosis
- Morphometry
- DNA analysis
- RNA analysis
- Protein analysis
- Neurochemical analysis
- Mystery cases
- Ethical and legal issues
- Health and safety
- Logistics
- Training
- Information technology

Some or all of the BNE partners participate in each of the work packages. Ring trials of immunohistochemical staining and assessment, morphometry and DNA extraction are in progress. While these methods are standard for most brain banks, newer methods such as proteomics and single cell analysis are not yet routine. BNE provides a forum for rapid spread of expertise relating to brain banking techniques, both in the consortium and to the wider neuroscience community. While the legal framework for brain banking varies between individual European countries, BNE is making efforts to harmonise the major ethical issues, including consent for different aspects of research. Work package updates will be made available through the BNE website. Requests to BrainNet Europe for brain tissue samples are invited provided that potential users have ethical approval for the studies which they wish to pursue. Information is available on the website.