

UK Parkinson's Disease Society Tissue Bank at Imperial College



Donate for the Future: How the UK Parkinson's Disease Society (PDS) Tissue Bank aims to advance Parkinson's and related research.

Left to Right
 Dr David Dexter: Scientific Director
 Prof Manuel Graeber:Neuropathologist
 Prof Richard Reynolds:Technical Advisor
 Dr Ronald Pearce: Consultant Neurologist



Left to Right
 Dr David Dexter: Scientific Director
 Louisa Djerbib: Research Technician
 Dr Ronald Pearce: Consultant Neurologist
 Helen Cairns: Research Assistant
 Dr Kirstin Goldring:Tissue Bank Manager
 Prof Manuel Graeber:Neuropathologist

Louisa Djerbib:
 Research Technician



Who are we?

Helen Cairns:
 Research Assistant



Dr David Dexter: Scientific Director of the Tissue Bank



Dr Kirstin Goldring:Tissue Bank Manager



Laura McKay: Tissue Bank Secretary

What is the aim of the UK PDS Tissue Bank?

The aim of the new PDS Tissue Bank is to supply high quality samples of human brain and other tissue to scientists studying the causes and treatments of Parkinson's Disease.

What system do we use to collect tissue?

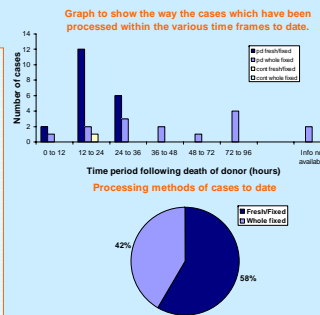
We run a prospective donor scheme in which donors register their wish to donate their brain, spinal cord and some CSF to the Tissue Bank when they die. Our registered prospective donors include people with Parkinson's, Parkinson's related disorders and control donors. Each prospective donor completes three forms; a donor form, which they sign themselves indicating their wish to donate; a next-of-kin form for a relative to complete; a health information form. The next-of-kin form is essential, due to the fact that following the death of a donor; permission from the next-of-kin has to be obtained before any tissue can be removed. Each prospective donor is sent a **donor card** which we ask them to carry with them at all times. The card contains our **24 hours emergency contact number**, this number is used so that we can be contacted as soon as possible following the death of a donor.

How quickly can the tissue be retrieved?

We aim to collect the tissue within 24 hours, although this is not always possible. The tissue will then be processed in one of 2 ways, depending on the time taken to collect the tissue.

How is the tissue processed?

If the tissue can be removed and returned to the Tissue Bank for processing within 24-36hrs of death, half the brain can be processed such that the tissue is snap frozen in 2cm³ blocks and the other hemisphere is fixed. The decision of which half is to be fixed is determined by the whether the donor has an odd or even year of birth. From the fixed hemisphere, blocks are taken for neuropathological analysis and the remain tissue is cut in to 2cm³ blocks, which are cryo-protected and then snap frozen. If it is not possible for the tissue to be removed and returned to the Tissue Bank until more than 36 hours after the death of the donor, then following removal, the whole brain is immediately fixed. Blocks for neuropathological analysis are taken from the fixed brain and the rest is stored as 2cm thick slices in fixative.



What tissue is available?

Tissue	Fresh	Frozen	Snap frozen blocks	Snap frozen sections	Fixed embedded sections	Fixed frozen blocks	Fixed frozen sections
Brain: Cerebrum	Yes*	-	Yes*	Yes*	Yes	Yes	Yes
Cerebellum	Yes*	-	Yes*	Yes*	Yes	Yes	Yes
Brain Stem	Yes*	-	Yes*	Yes*	Yes	Yes	Yes
Optic nerves, tracts and chiasm	Yes*^	-	Yes*^	-	-	-	-
Olfactory bulb and tract	Yes*^	-	Yes*^	-	-	-	-
Spinal Cord	Yes^	-	Yes*^	Yes*^	Yes^	Yes^	Yes^
CSF	Yes^	Yes^	-	-	-	-	-

*(depends on processing method)
 ^ (not always available)

What information is available on the tissue?

The information available on the donor and the tissue includes the following: sex, age at death, post mortem and processing delay, brain weight, pH of CSF, pictures of the tissue from the processing procedures, clinical report (prepared from the patients medical notes), neuropathological report (including diagnosis).

What is involved in obtaining tissue for research from the Tissue Bank?

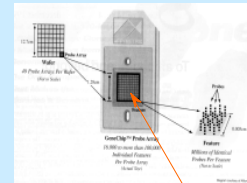
Researchers are asked to complete and return a tissue request form, which outlines the project the tissue will be used for and details the tissue required. Each request is reviewed by an independent scientific panel, to verify the scientific merit and its possible benefit to Parkinson's disease research. Once ratified the Tissue Bank will supply the appropriate tissue to the research team. The research teams are also asked to provide a written report of the findings of research carried out on tissue supplied from the Tissue Bank.

Current research being carried out on tissue from the Tissue Bank

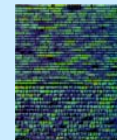
Professor Graeber's group at Imperial College London are already using tissue from the Tissue Bank for *high-throughput* analysis microarray studies. They are investigating whether there is any up or down regulation of genes in Parkinson's tissue in comparison to control tissue. This research on the genes involved in Parkinson's is concentrating on the genes responsible for the mechanisms of cell death that we have identified so far e.g. oxidative stress. Following identification of genes that are either up or down regulated the group will look at the expression of these genes at the cellular level i.e. does it occur in neurones, glia etc, using UV laser capture dissection (see below). Fresh tissue from the Tissue Bank has been vital for this research. Results from this work are being presented at the Society of Neuroscience Annual Meeting 2003:

- 1) EXPRESSION PROFILING OF THE PARKINSONIAN SUBSTANTIA NIGRA USING OLIGONUCLEOTIDE MICROARRAYS. L.B. Moran; D.C. Duke; D.T. Dexter; F.E. Turkheimer; R.K. Pearce; M.B. Graeber.
- 2) PATHWAY AND CHROMOSOMAL EXPRESSION ANALYSIS OF THE PARKINSONIAN SUBSTANTIA NIGRA USING OGLIONUCLEOTIDE MICROARRAYS. D.C. Duke; L.B. Moran; D.T. Dexter; R.K. Pearce; F.E. Turkheimer; M.B. Graeber.

Microarray Technology

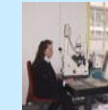


Editorial (1996) To affinity... and beyond. Nature Genet 14:367-370

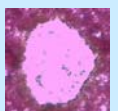
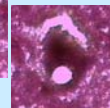
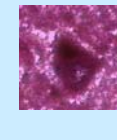


Chee M, Yang R, Hubbell E, Bero A, Huang XC, Stern D, Winkler J, Lockhart DJ, Morris MS, Fodor SPJ (1995) Accessing genetic information with high-density DNA arrays. Science 274:610-614

Isolation of Specific cells



UV Laser Capture Microdissection



Isolation of human nigra neurons



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