



# Brain Bank Bulletin

Issue 5  
Winter  
2005

The PDS Tissue Bank at Imperial aims to help understand what causes Parkinson's and assist in the development of better drug treatments by providing high quality brain tissue to researchers working in the field of Parkinson's and related neurological disorders. The Tissue Bank also aims to enhance the public's awareness of Parkinson's, promote the work of the Tissue Bank and increase the numbers of volunteers who are willing to sign up to the donor scheme. The Tissue Bank also aims to collect the tissue so that it is suitable for all research needs and that it is collected in the most ethical manner.

## Tissue Bank collects its 100th brain!

In June 2005, the PDS Tissue Bank at Imperial College collected its 100<sup>th</sup> brain! This is great news and means that we can supply even more scientists with valuable tissue to carry on their work to combat Parkinson's. However, we are still collecting brain tissue donated by people affected by Parkinson's related disorders at a quicker rate than we are from healthy donors. For every request for brain tissue from researchers we not only have to supply tissue from a group of Parkinson's donors but also from a group of healthy donors. This enables researchers to examine brain function in healthy tissue for a comparison. Hence, we need more healthy potential donors to sign up to the Tissue Bank scheme. You could help by passing this newsletter onto friends or work colleagues who may be interested in the good work carried out by the Tissue Bank and how they can make a valuable

contribution to research. You may also be asking "If we have collected 100 brains why do we need to carry on collecting tissue"? Indeed, the brain is a large structure but many of brain regions affected by Parkinson's are very small. For example one of the principle brain areas affected in Parkinson's, the substantia nigra is only about the size of your thumbnail. Such parts of the brain are in great demand and get utilised quickly by researchers, hence we need a constant flow of tissue being donated to the Tissue Bank. On behalf of the Tissue Bank and the Parkinson's Disease Society we would like to thank you all, particularly the families of those who have donated tissue, for your contribution to support Parkinson's research.

**Dr David Dexter**  
Scientific Director



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## Running in support of the PDS



**Parkinson's**  
Disease Society

Dr Kirstin Goldring, the Tissue Bank Manager, was a lovely day and the PDS were really well supported along with a team of 83 runners (including 8 with Parkinson's) completed the 25th London Marathon in aid of the PDS. Kirstin managed to finish in a time of 4 hours 38 minutes well under her aim of 5 hours and managed to raise over £1600 in the process. It



was a lovely day and the PDS were really well supported all along the route and hope to raise £210,000 from the event.

Congratulations to all those who took part and supported the event!

Members of the Tissue Bank team, Kirstin Goldring, Helen Cairns, Louisa Djerbib and Laura McKay will all be running for the PDS in the Hydro Active women's 5km run in Hyde Park on Sunday 4<sup>th</sup> September.

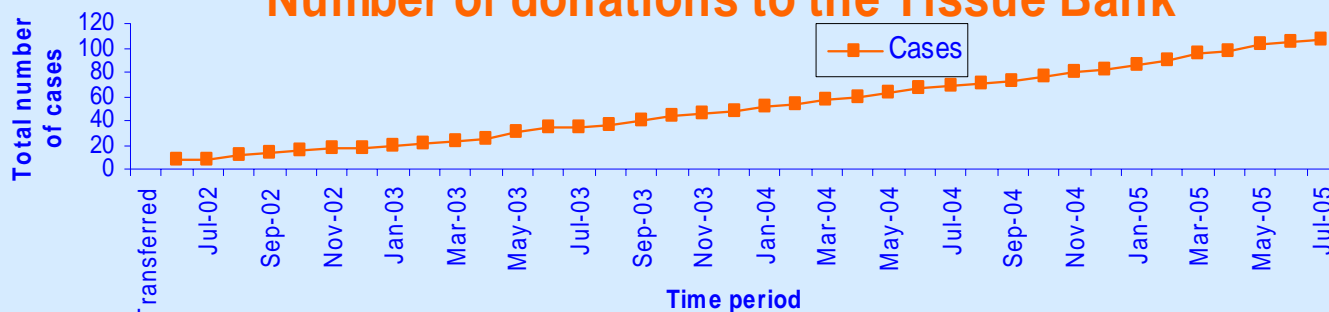
## Identifying new drug target for Parkinson's treatments from research findings from donated brain tissue.

In the past twenty years there has been an extensive amount of research utilising donated human brain tissue in an attempt to understand why the cells in the Parkinson's brain are dying. A significant amount of this work in the UK has been funded by the Parkinson's Disease Society. From this work scientists have been able to start to put together a complex picture of many different factors, all, or some of which may seriously affect the well being of brain cells and cause them to die. Of these, three areas have received extensive scientific support. Firstly, in Parkinson's there is a defect in the mitochondria, the power stations in our cells that provide the energy to keep our cells alive. Secondly, there have been defects detected in the proteasome, a complex in our cells that handles and removes defective proteins that would otherwise be toxic to the cells. Thirdly, a process called oxidative stress has been implicated where toxic chemicals called "free radicals" interact with and damage many components of our cells. These components include the membrane that cover the cells, the vital proteins that form the building blocks of cells and our genetic information that encodes for everything the cells needs to keep it functioning normally. Although it is not fully understood how these three defective systems interact together, they are all potential targets for the development of drugs to stop them happening in order to protect the cells from dying. Here at Imperial we have been concentrating on the oxidative stress pathway and trying to find out whether we can neutralise these damaging free radicals. Free radicals are not all bad, indeed our body

uses them to kill off bacteria that cause infections but when they are produced in excessive amounts then they can cause damage to our own cells. Our bodies use molecules called antioxidants, many derived from our diet e.g. vitamin C and E, to neutralise free radicals and prevent their damaging effects. Unfortunately, one of the main antioxidants in the brain, a molecule called glutathione, is deficient in the Parkinsonian brain. Hence, we have been testing other antioxidants to see whether they could possibly be used as a treatment to stop the cells from dying in the Parkinson's brain. One such group of antioxidants that have shown promising results in tests, are a group of molecules called flavonoids, they also occur in nature, for example in fruits, vegetables, seeds, grain, tea and red wine, but it is only now that we are realising that they may have medical uses. Not only do these flavonoids potentially neutralise the free radicals but we have recently demonstrated that some flavonoids can boost the brains own antioxidant defence systems giving it a greater ability to fight off free radical damage. In animal models of Parkinson's disease we have shown that some flavonoids are capable of not only protecting the nerve cells of the brain against toxins but also they can revive sick and dying nerve cells. Obviously, such studies require further validation before they can be tested on patients but they do highlight how work on donated brain tissue often points the way in developing new drugs to combat Parkinson's.

**Dr David Dexter**  
**Scientific Director**

### Number of donations to the Tissue Bank





## An update on the Research Agenda, from the new Research and Development Director at the PDS

Research has always been a major focus of the Parkinson's Disease Society (PDS) and more than £30 million has been invested in this area since the Society was established. Building upon this, the Society has generated a Research Agenda following extensive consultation with a large number of stakeholders. This sets out the research priorities for the coming years and will be regularly updated with specific input from the Society's members.

I was appointed as Director of Research and Development at the PDS in March 2005 with one of my key responsibilities being to oversee the implementation of the Research Agenda. I have had extensive experience in the areas of neuroscience research, grant making and driving multi-disciplinary research programmes. Prior to taking up my present position, I was Director of the Dundee Alzheimer Research Centre and a Senior Lecturer in Biochemical Psychiatry at the University of Dundee.

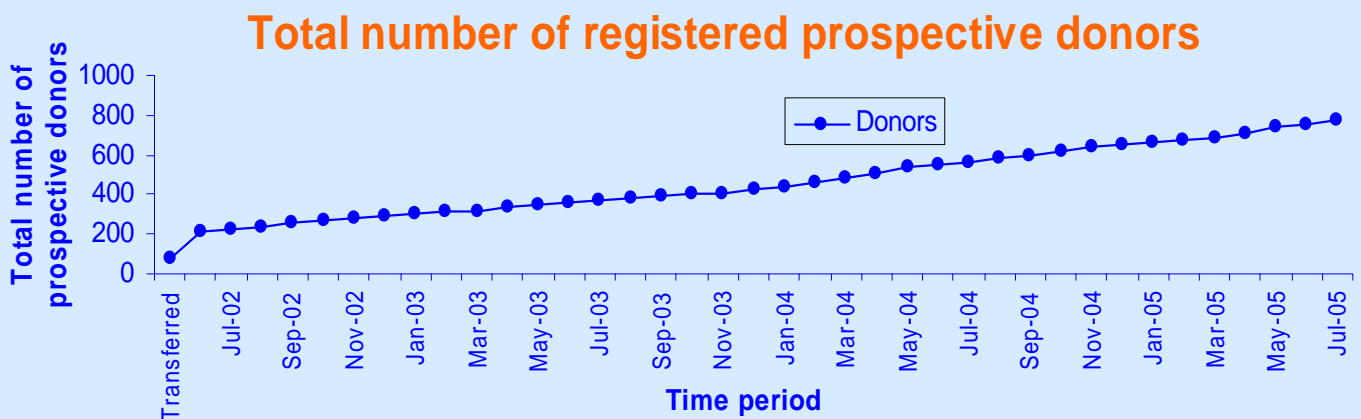
The PDS Brain Tissue Bank is one of the key projects funded by the Society and it provides a vital resource whereby the biochemical aspects of PD-associated pathology can be studied. This provides

a valuable insight into the events that occur at the early stages of PD and such knowledge is vital for the potential design of new therapeutic agents. Prior to taking up my position in the PDS, my research specifically dealt with investigating the changes that occur in the brains of people with Alzheimer's disease. I have had much useful collaboration with brain banks throughout the UK and abroad and am extremely aware of their important role in research.

Within the Research Agenda, the Society is seeking to broaden the scope of its research base, placing an increased emphasis on aspects of social research that will have a direct impact on the lives of people with Parkinson's, their families and carers. A balance between the complementary research strands will ensure that the Society serves both people with Parkinson's now, and those who may potentially develop the condition.



**Dr Kieran Breen**  
PDS Director of Research and Development



### Change of Address/ Comments Form

Date:  Name of Donor:  Donor No:

Old Address:

New Address:

Post Code:

Date of address change:

Contact No:



### Contact Information

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Tissue Bank at Imperial College**

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Clockwise from top left: Dr David Dexter, Scientific Director; Dr Kirstin Goldring, Tissue Bank Manager; Helen Cairns, Research Assistant; Louisa Djerbib, Research Technician; Laura McKay, Tissue Bank Secretary; Professor Richard Reynolds, Technical Advisor; Dr Ronald Pearce, Consultant Neurologist; Neuro-pathology Team; Dr Stephen Gentleman, Dr Federico Roncaroli and Professor Manuel Graeber



Please tear this section off and return to us free of charge with your comments or change of address.

**Comments/ Suggestions/ Questions:**

## Future Branch Talks

- 3rd October 2005, West Midlands 7.30pm
- 19th October 2005, Stockport 2pm
- 27th Oct 2005 Birmingham Support Group
- 11th November 2005, Canterbury 7.30pm
- 15th November 2005, Eastbourne 2pm
- 21st November 2005, Cirencester 2pm
- 4th February 2006, Bristol, 4pm
- 15th March 2006, Beckles
- 29th March 2006, Newport, 7pm
- 6th April 2006, Redcar
- 10th May 2006, Aberdeen
- 14th June 2006, Chichester 7.30pm

**Please contact us if you require further details.**

### Notices

We would like to thank all the branches who have given donations to the Tissue Bank over the past year.

**Durham, Hull & East Yorkshire, & York.**

Their kind donations went towards refurbishing a room for our new freezers which are vital for ongoing tissue storage, as well as other valuable laboratory equipment

### Our Team