

Study to look at nerve cells in patients with Alzheimer's disease

Researchers at the University of Bristol have been awarded a grant that by using state-of-the-art stem cell technology will enable them to analysis nerve cells produced from skin biopsies of patients with Alzheimer's disease (AD).



The grant of £164,000 has been awarded by local charity [BRACE](#), who fund research into Alzheimer's and other forms of dementia.

The research group have applied recent advances in stem cell technology to convert cells obtained from human adult skin biopsies into nerve cells of the type found in a part of the brain known as the nucleus basalis (nb).

These nerve cells are the main source of the chemical acetylcholine in the brain and degenerate at an early stage in AD. To try and limit the impact of this degeneration on memory AD patients are given the drugs Aricept, Radazyne or Exelon, which prolong the action of any remaining acetylcholine.

Dr Maeve Caldwell, Senior Research Fellow in the University's [School of Clinical Sciences](#), who together with Seth Love, Professor of Neuropathology in the [Dementia Research Group](#), will be leading the study, said: "We are extremely grateful to BRACE for funding this study. The use of this adult stem cell approach should enable us in the future to test a range of hypotheses concerning the earliest abnormalities in AD, the environmental influences on their development, and the extent to which they can be prevented or reversed."

Mark Poarch, Chief Executive of BRACE, added: "£164,000 is a lot of money, but it is the sum of much smaller donations and fundraising efforts by thousands of people. While big donations and legacies are always welcome, of course, it just shows that we can all make a difference, whatever our means.

"BRACE will be 25 years old next year, and we hope that large numbers of local people and businesses will chip in to help us make it a great year in the fight against Alzheimer's."

The research group hope to use this new adult stem cell technology to generate and compare the nb-type nerve cells obtained from skin biopsies of AD patients with those from elderly controls. The study will find out whether the nerve cells from patients differ from those of controls in their ability to produce acetylcholine and in their capacity to cope with the presence of amyloid and other chemical stresses that are present in the brain in AD.

The researchers are also interested in exploring whether the nb-type nerve cells from people who have a genetic profile that makes them more likely to develop AD (ie. possess a gene known as ApoE4) are more susceptible to chemical stress or differ in their production of acetylcholine from the nerve cells obtained from people who are at much lower risk of developing AD.

The research group expect these experiments to provide important new information on the behaviour and vulnerability to AD of nerve cells from individual living patients and controls. The methods used and developed in these studies will lead to the much more accurate modelling of AD in cell culture than has previously been possible.

The research team from the University's School of Clinical Sciences who will be working on the study are: Professor Seth Love, Professor of Neuropathology; Dr Maeve Caldwell, Senior Research Fellow; Dr Pat Kehoe, Reader in Translational Dementia Research; Professor James Uney, Professor of Molecular Neuroscience and Dr Liz Coulthard, Consultant Senior Lecturer.

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