30 October 2011 Last updated at 18:31

**BBC**

**DNA gene find 'transforms' theories on how brain works**

The genetic make-up of our brain cells changes thousands of times over the course of our lifetimes, according to new research.

Scientists at the Roslin Institute in Edinburgh have identified genes, called retrotransposons, responsible for tiny changes in the DNA of brain tissue.

They say their discovery completely overturns previous theories about how the brain works.

It could also increase understanding of conditions such as Parkinson's disease.

The study shows for the first time that brain cells are genetically different to other cells in the body, and are also genetically distinct from each other.

The research was carried out in collaboration with scientists from the Netherlands, Italy, Australia, Japan and the US.

They found that the retrotransposons were particularly active in areas of the brain linked to cell renewal.

Genetic changes

It is hoped that by mapping the location of these genes, scientists could identify mutations that impact on brain function and may cause diseases such as Parkinson's to develop.

The researchers are now investigating whether brain tumour formation and conditions which affect the memory, such as Alzheimer's, are associated with a change in retrotransposon activity.

Dr Geoff Faulkner, from the Roslin Institute, based at the University of Edinburgh, said: "This research completely overturns the belief that the genetic make-up of brain cells remains static throughout life and provides us with new information about how the brain works.

"If we can understand better how these subtle genetic changes occur we could shed light on how brain cells regenerate, how processes like memory formation may have a genetic basis and possibly link the activity of these genes to brain diseases."

The scientists' findings are published in the journal Nature.

**Related Internet links**

* [The Roslin Institute](http://www.roslin.ed.ac.uk/)
* [The University of Edinburgh](http://www.ed.ac.uk/home)
* [Parkinson's UK](http://www.parkinsons.org.uk/)
* [Nature Communications](http://www.nature.com/ncomms/index.html)

Independent.co.uk

October 30, 2011 Sunday 8:40 AM GMT

**Brain DNA 'changes through life'**  
**BYLINE:** By Lynsey Bews  
  
**SECTION:** SCIENCE  
  
**LENGTH:** 299 words

New research on brain cells could shed more light on neurological diseases, scientists have discovered.

Researchers from The Roslin Institute at the University of Edinburgh have found brain cells alter their genetic make-up during a person's lifetime.

They have identified genes - known as retrotransposons - responsible for thousands of tiny changes in the DNA of brain tissue.

Researchers, whose work is published in the journal Nature, found that the genes were particularly active in areas of the brain linked to cell renewal.

By mapping the locations of these genes in the human genome, scientists could identify mutations that impact on brain function and that may cause diseases to develop.

The study shows for the first time that brain cells are genetically different to other cells in the body and are also genetically distinct from each other.

Scientists are now researching whether brain tumour formation and neurodegenerative diseases such as Alzheimer's are associated with a change in retrotransposon activity.

Dr Geoff Faulkner said: "This research completely overturns the belief that the genetic make-up of brain cells remains static throughout life and provides us with new information about how the brain works.

"If we can understand better how these subtle genetic changes occur we could shed light on how brain cells regenerate, how processes like memory formation may have a genetic basis and possibly link the activity of these genes to brain diseases."

The research was carried out in collaboration with scientists from the Netherlands, Italy, Australia, Japan and the United States, and was funded by the Wellcome Trust, the Biotechnology and Biological Sciences Research Council and the Australian National Health and Medical Research Council.

PA.

Metro (UK)

October 31, 2011 Monday   
Edition 1;   
Scotland

**Brain cell link to identifying diseases**  
**SECTION:** NEWS; Pg. 7  
  
**LENGTH:** 151 words

BRAIN cell research could shed more light on neurological diseases, it was claimed yesterday.

Researchers from the Roslin Institute at the University of Edinburgh have found brain cells alter their genetic make-up during a person's lifetime.

They have identified genes - known as retrotransposons - responsible for thousands of tiny changes in the DNA of brain tissue.

The work, published in the journal Nature, found the genes were particularly active in areas of the brain linked to cell renewal.

By mapping the locations of these genes, scientists could identify mutations that may cause diseases to develop.

The study shows for the first time that brain cells are genetically different to other cells and are also genetically distinct from each other.

Scientists are now researching whether brain tumour formation and diseases such as Alzheimer's are associated with a change in retrotransposon activity.

The Scotsman

October 31, 2011, Monday   
1 Edition

**Brain cell breakthrough in Alzheimer's fight**  
**BYLINE:** Lyndsay Buckland Health Correspondent  
  
**SECTION:** Pg. 20  
  
**LENGTH:** 505 words

Discoveries about how brain cells can change their genetic make-up during a person's lifetime could shed light on serious diseases such as Alzheimer's, Scottish research suggests.

A team at Edinburgh University found that genes known as retrotransposons were responsible for thousands of tiny changes in the DNA of brain tissue.

The findings could help scientists looking for the causes of brain diseases like dementia and brain tumours, or be used in tests to help identify those at risk of suffering problems in future.

The researchers, from The Roslin Institute at Edinburgh University, found that the retrotransposon genes were particularly active in areas of the brain linked to the renewal of cells.

By finding the locations of these genes in the human genome - a map of our entire genetic make-up - scientists could identify mutations that impact on brain function and that may cause diseases to develop.

For the first time, the study, published in the journal Nature, also showed that brain cells are genetically different to other cells in the body and are genetically distinct from each other.

The scientists are now researching whether brain tumours and diseases like Alzheimer's are linked to a change in retrotransposon activity.

Researcher Dr Geoff Faulkner said: "This research completely overturns the belief the genetic make-up of brain cells remains static throughout life and provides us with new information about how the brain works.

"If we can understand better how these subtle genetic changes occur we could shed light on how brain cells regenerate, how processes like memory formation may have a genetic basis and possibly link the activity of these genes to brain diseases."

Dr Faulkner said previously scientists believed that every cell in the body was the same in its genetics, whereas their findings showed that brain cells could vary genetically during life.

He said in future it may be possible to use the findings to help predict whether some people may be more prone to some diseases than others, but further work was needed.

"The issue at the moment is that we don't know if these conditions are necessary for a healthy brain, so it could be that this level of variation is necessary for functioning," he said.

"But you could imagine that too much mutation in a brain could lead to cancer and perhaps to neurodegeneration such as Alzheimer's.

"Our study dealt with healthy brains so we can speculate on disease and think there is some involvement, but we don't have direct evidence of that at the moment."

Dr Faulkner said now they had found that brain cells were actually changing, the next question was to look at what they were doing as they changed.

"We are really interested in looking at different types of disease and have plans to look at brain tumours and some Alzheimer's cases as well," he said.

A spokeswoman for Alzheimer Scotland said: "Alzheimer Scotland welcome any research that will help us to better understand what causes dementia.

In time, this may allow us to prevent or even cure the illness."