

Gene 'switch' is another possible cause for depression

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Depression

(Medical Xpress) -- UK scientists have discovered another piece in the jigsaw behind depression with a finding that could help with the future development of more personalised treatment for the illness.

Depression affects around 121 million people worldwide - it is estimated that at some point in our lives one in five of us will experience the condition which is thought to be caused by a range of factors.

Now University of Aberdeen scientists have found that a mutation in a 'switch' that controls a key gene in the brain appears to play a part in the illness.

Researchers were looking at a gene known as BDNF which is crucial for

the connection and survival of nerve cells and is found in the part of the brain that controls mood. BDNF – together with childhood trauma - has already been linked with [depression](#).

They looked at a ‘control’ that sits next to BDNF which acts as an ‘off switch’. Genes have ‘off switches’ and ‘on switches’ which are necessary for them to function properly.

Scientists, working in collaboration with the Institute of Psychiatry at King’s College London, found that mutation in this ‘off switch’ affected the levels of protein produced by BDNF.

The study was led by Dr. Alasdair MacKenzie, a Reader in Neuroscience at the University of Aberdeen's Kosterlitz Centre for Therapeutics - which is gaining international recognition for its research into the role of gene regulation and disease.

He said: “If there is either too much or too little of the BDNF protein in the brain then behavioural changes characteristic of depression will be produced.

“The mutation we studied increased the strength of the “off” switch which, in turn, reduced the amounts of BDNF in critical parts of the brain, destabilising the genetic balance required to maintain mental health.”

The researchers then looked at whether they could deactivate the ‘off switch’ with drugs known to act on these switches, and they discovered that they could.

Dr. Ben Hing from the University of Aberdeen, who carried out much of the research, added: “Our first attempts to control the activity of the ‘off switch’ with individual drugs were unsuccessful.

“However after we started to use specific combinations of these drugs we found a way to reverse the effects of the ‘off switch’.”

Researchers say their finding could be a step towards the development of more effective, specially tailored anti-depressants.

Dr. Mackenzie said: “The ability to manipulate the activity of this [switch](#) with combinations of drugs raises the possibility of devising novel drug treatments specifically designed to reverse the effects of this mutation.

“Importantly, the finding that combinations of drugs are more effective than high doses of individual drugs raises the possibility of the development of more specific therapies with milder side effects.”

Professor Ruth Ross who heads the University of Aberdeen’s Kosterlitz Centre for Therapeutics, added: “Many [drug](#) therapies prove to be ineffective on particular groups of patients due to genetic differences.

“The results of this exciting and groundbreaking study provide a novel avenue for the development of more effective ‘tailor-made’ therapies based on an understanding of the genetics of individual patients.”

The team’s findings appear in the journal *Biological Psychiatry* and the study was funded by the Medical Research Council.

Provided by University of Aberdeen

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