

Mice bred to mimic schizophrenia

US scientists have genetically modified mice to exhibit both the anatomical and behavioural defects associated with the complex condition schizophrenia.

Previous studies that rely on drugs can only mimic the symptoms of the disease, such as delusions and paranoia.

But the new work, based on a key genetic change, could aid a much greater understanding of the disease.

The Johns Hopkins University study appears in Proceedings of the National Academy of Sciences.

Animal models of schizophrenia have been hard to design since many different causes underlie this disease.

However, the Johns Hopkins team were able to take advantage of the recent discovery of a major risk factor for the disease.

Scientists pinpointed a key gene - dubbed DISC 1 - which makes a protein that helps nerve cells assume their proper positions in the brain.

The Johns Hopkins team generated mice that make an incomplete, shortened form of the DISC 1 protein in addition to the regular type.

The short form of the protein attaches to the full-length one, disrupting its normal duties.

As these mice matured, they became more agitated when placed in an open field, had trouble finding hidden food, and did not swim as long as regular mice - behaviours that echo the hyperactivity, smell defects and apathy observed in schizophrenia patients.

Magnetic resonance imaging (MRI) also revealed characteristic defects in brain structure, including enlarged lateral ventricles, a region that circulates the spinal fluid and helps protect against physical trauma.

Filling the gaps

Researcher Professor Akira Sawa said the defects in these mice were not as severe as those typically seen in people with schizophrenia, because more than one gene is required to trigger the clinical disease.

"However, this mouse model will help us fill many gaps in schizophrenia research," he said.

"We can use them to explore how external factors like stress or viruses may worsen symptoms.

"The animals can also be bred with other strains of genetically engineered mice to try to pinpoint additional schizophrenia genes.

"Our goal is trying to identify a strategy that may cure schizophrenia."

Paul Corry, of the mental health charity Rethink, said: "This is the first in a series of genetic 'breakthroughs' we are expecting to see over the next 12 months in the field of severe mental illness.

"Research in this field deserves to be better funded and supported.

"It is the case that schizophrenia is a complex human condition in which genes play just one part. However, this will give hope of further advances."



A key gene was defective in the mice

“ This mouse model will help us fill many gaps in schizophrenia research ”

Professor Akira Sawa
Johns Hopkins University