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Study could shed light on causes of epilepsy

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Lack of a particular protein in early brain development might be the root of certain types of epilepsy.

A study by researchers on embryonic mice at the Hong Kong University of Science and Technology found that with less of the $\alpha 2$ -chimaerin protein, brain cells in early development would not migrate to the correct areas of the brain, and also become hyperactive in firing neurons.

'The brain's neurons form circuitry and fire electric transmissions. You need precise wiring for daily activities ... the consequence if they fail to migrate, if they are impaired, is Lissencephaly, or smooth brain which causes epileptic seizures and mental retardation,' said Jacque Ip Pak-kan, one of the main researchers.

Epilepsy is caused when the brain releases excessive electrical signals causing its normal wiring to go awry. It can be brought on by deformations during early development or by injuries in later life.

In Hong Kong, there are an estimated 40,000 to 70,000 epileptics based on studies by Queen Mary Hospital, and global rates of epilepsy. Around 50 million people worldwide are thought to have the disorder.

'The next step is to think about gene therapy,' said Professor Nancy Ip Yuk-yu who supervised the study, though she declined to say when such treatment could be viable for the public.

The discovery would most probably affect research into focal epilepsy where the seizures start from one part of the brain and spread to others, said Gardian Fong Chung-yan, a clinical neurologist and member of the Hong Kong Neurological Society.

He said there were possibly thousands of causes of the disorder, not just the improper migration of brain cells.

'I can't comment on the study ... but with epilepsy, and with neurology in general, how diseases occur is kind of a mystery. Anything that will help us to learn how a disease develops, if the discovery shows the key processes of the disease, is good,' he said.

The HKUST findings were published in Nature Neuroscience, a well-respected journal in the neuro-science field.