



THE UNIVERSITY *of* EDINBURGH

## *News Release*

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### **Brain study sheds light on processes that prompt epilepsy seizures**

A study of how brain cells communicate with each other when minds are most active could aid research into epilepsy, experts say.

Researchers have identified a key molecule – called VAMP4 – that is required for neurons to send messages to each other during bursts of brain activity.

The University of Edinburgh team now plans to investigate whether altering VAMP4 levels can help to switch off excess brain activity and calm the symptoms of epileptic seizures.

They say the findings could eventually lead to new medicines that help patients with epilepsy who do not respond to existing treatments.

Seizures are caused by abnormal electrical signalling in the brain that is prompted by an excess of communication between neurons.

Scientists focused on a specific process called activity-dependent bulk endocytosis (ABDE), which enables neurons to continue communicating during bursts of brain activity.

They found that VAMP4 is essential for ADBE but not required for other processes that are routinely involved in communication between neurons.

This means that medicines designed to target VAMP4 could have fewer side effects for normal day-to-day brain function than existing epilepsy treatments.

Because ABDE is also involved in other brain functions – such as creating new memories – further research is needed to understand what the effects of manipulating VAMP4 might be, the researchers say.

The study is published in the journal *Neuron*. It was funded by the Medical Research Council.

Professor Mike Cousin, of the University's Muir Maxwell Epilepsy Centre, said: "This research is still in very early stages but it gives us a new avenue to explore for new epilepsy treatments, which are urgently needed. Around one third of children with epilepsy cannot control their seizures with the treatments that are currently available."

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