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Important breakthrough in identifying effect of epilepsy treatment

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50 years after valproate was first discovered, research published today in the journal *Neurobiology of Disease*, reports how the drug works to block seizure progression.

Valproate (variously labelled worldwide as Epilim, Depacon, Depakene, Depakote, Orlept, Episenta, Orfiril, and Convulex) is one of the world's most highly prescribed treatments for epilepsy. It was first discovered to be an effective treatment for epilepsy, by accident, in 1963 by a group of French scientists.

In thousands of subsequent experiments, animals have been used to investigate how valproate blocks seizures, without success. Scientists from Royal Holloway University and University College London have now identified how valproate blocks seizures in the brain, by using a simple amoeba.

"The discovery of how valproate blocks seizures, initially using the social amoeba *Dictyostelium*, and then replicated using accepted seizure models, highlights the successful use of non-animal testing in biomedical research," said Professor Robin Williams from the School of Biological Sciences at Royal Holloway.

"Sodium valproate is one of the most effective antiepileptic drugs in many people with epilepsy, but its use has been limited by side-effects, in particular its effect in pregnant women on the unborn child," said Professor Matthew Walker from the Institute of Neurology at University

College London. "Understanding valproate's mechanism of action is a first step to developing even more effective drugs that lack many of valproate's side-effects."

"Our study also found that the decrease of a specific chemical in the brain at the start of the seizure causes even more seizure activity. This holds important implications for identifying underlying causes," added Professor Williams.

Provided by Royal Holloway, University of London