

Focal epileptic seizures linked to abnormalities in three main brain regions

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Credit: Mary Ann Liebert, Inc., publishers

A new study that used functional magnetic resonance imaging (fMRI) and computation pattern analysis to identify differences in regional brain activity between subjects with focal epilepsy and healthy individuals highlighted three common areas of abnormality. Seizures in people with focal epilepsy can originate in various sites in the brain, but these new findings link those sites to three main brain regions, as reported in *Brain Connectivity*.

In the article "[Abnormal Brain Areas Common to the Focal Epilepsies: Multivariate Pattern Analysis of fMRI](#)," the authors propose that "these brain areas may represent key regional network properties underlying focal epilepsy."

Mangor Pedersen and coauthors from The Florey Institute of Neuroscience and Mental Health, The University of Melbourne, and Austin Health, Melbourne, Australia, combined three distinct but complementary fMRI measures to distinguish alterations in brain activity and the interaction between [brain regions](#). They found abnormalities in the ipsilateral piriform cortex, temporal neocortex, and [ventromedial prefrontal cortex](#) in individuals with focal epilepsy. In addition, the researchers showed additional effects in the insula and frontal cortex and the ipsilateral thalamus/striatum.

"Focal epilepsy is a diverse neurological condition with seizures emanating from different [brain areas](#) depending on the individual patient," says Christopher Pawela, PhD, Co-Editor-in-Chief of *Brain Connectivity* and Assistant Professor, Medical College of Wisconsin. "Pedersen and colleagues were able to identify common brain regions affected in all [focal epilepsy](#) patients. Further, they were able to accurately separate epilepsy patients from healthy controls using pattern matching analysis which may be an important step towards developing a MR biomarker for the condition."

Provided by Mary Ann Liebert, Inc

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