

Lay Summary

BRAIN UK Ref: 16/009

Evaluating mTOR pathway hyperactivity in intractable epilepsy

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Epilepsy is a common neurological condition where patients have recurrent seizures. A small number of patients can have many seizures in a day and may require brain surgery to control them.

The “mechanistic target of rapamycin” (mTOR) pathway is a vital cellular pathway. It is involved in many cellular functions, including cell growth and excitability in brain cells. Its overactivity may be responsible for making individuals prone to have epilepsy.

There is suggestion of increased activity of mTOR pathway in brain tissue of individuals who had brain surgery to control their epilepsy. We would like to evaluate if this overactive mTOR pathway is present in a wider variety of patients who need brain surgery for managing their seizures.

A group of medications known as mTOR inhibitors, such as Sirolimus (rapamycin) and Everolimus, have been effective in reducing seizures in animal models as well as clinical trials in conditions such as Tuberous sclerosis. Individuals with Tuberous sclerosis commonly have epilepsy, with high burden of seizures.

If the study suggests that the brain tissues of patients with difficult to control epilepsy have overactive mTOR pathway, it is likely we would be able to test if mTOR inhibitors can be used to manage these cases.