TALLAHASSEE, Fla. (WCTV) - Florida State University researchers have found a link between a protein in the brain and a heightened chance for neurodegeneration in people with temporal lobe epilepsy (TLE), according to a release by the FSU College of Medicine.

Professor of Biomedical Studies Sanjay Kumar led the team, using an innovative technique known as area-specific tissue analysis (ASTA) that allowed them to study small amounts of tissues from hard-to-reach areas in the brain.

The release says the Kumar Lab focuses on the basic workings of TLE and “identifying and isolating vulnerable cells and circuits within the hippocampal region to” help create better treatments. TLE is the most common form of epilepsy in adults and is often unaffected by medications currently available.

“Kumar, FSU researcher Stephen Beesley and former doctoral student Thomas Sullenberger focused on a chemical messenger called glutamate and one of its receptors, N-methyl-D-aspartate (NMDA),” according to the release.

Glutamate helps with learning and memory and must be in the right concentration at the right time for proper brain function. The release also notes that it is an amino acid, which helps build proteins.

The team saw that while GluN1 and GluN2, two proteins associated with NMDA, “were evenly distributed in a critical hippocampal region of the brain, a third one — GluN3 — was distributed on a gradient.” Consistent neuron loss in the hippocampal and parahippocampal regions is a key feature of TLE.

Professor Kumar said the relationship between GluN3 and cell loss was not previously known and that “this advance in cellular biology is an important step for developing therapies to help patients.”

The release said this discovery will help researchers tighten their focus and “identify exactly where neurons are dying and in how large an area.”

“This research shows how area-specific tissue analysis can be a useful tool,” Kumar said. “I’m excited to explore what further research with this technique can uncover.”

The work of Kumar’s team is partially supported by the National Institute of Neurological Disorders and Stroke, a division of the National Institutes of Health.
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