

Link between signaling molecules could point way to therapies for epilepsy, stroke, other diseases

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In the Old West, camps sent smoke signals across distances to share key developments or strategy. Likewise, two important signaling molecules communicate across nerve cells to regulate electrical and chemical activity, neuroscientists from the UT Health Science Center San Antonio reported today.

The findings in rodent models have implications for potential future treatment of epilepsy, stroke and other problems, the researchers said.

"We now have novel targets for therapeutic intervention for a range of neurological and cardiovascular diseases, including stroke, epilepsy, dementia, hypertension, mental illness and others," said senior author Mark S. Shapiro, Ph.D., professor of physiology at the Health Science Center. "This study should guide clinicians and pharmaceutical companies in developing new therapies against mental, neurological, cardiovascular or cerebrovascular diseases that afflict many millions of people."

By isolating nerve cells from rats, the San Antonio team found a relationship between signaling enzymes called phosphoinositide kinases and calcium ions. Calcium transport and levels of calcium concentrations inside [nerve cells](#) are extremely important for proper neurobiological function, Dr. Shapiro said.

In epilepsy, for example, it is thought that the hyper-excitability in the brain causes abnormal elevations of intracellular calcium ions, which is extremely toxic. Thus, [epileptic seizures](#) often predispose people to additional seizures, as the normal regulation of [brain activity](#) increasingly breaks down.

The study is in the Jan. 7 issue of the [Journal of Biological Chemistry](#).

Provided by University of Texas Health Science Center at San Antonio

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