Countering brain chemical could prevent suicides

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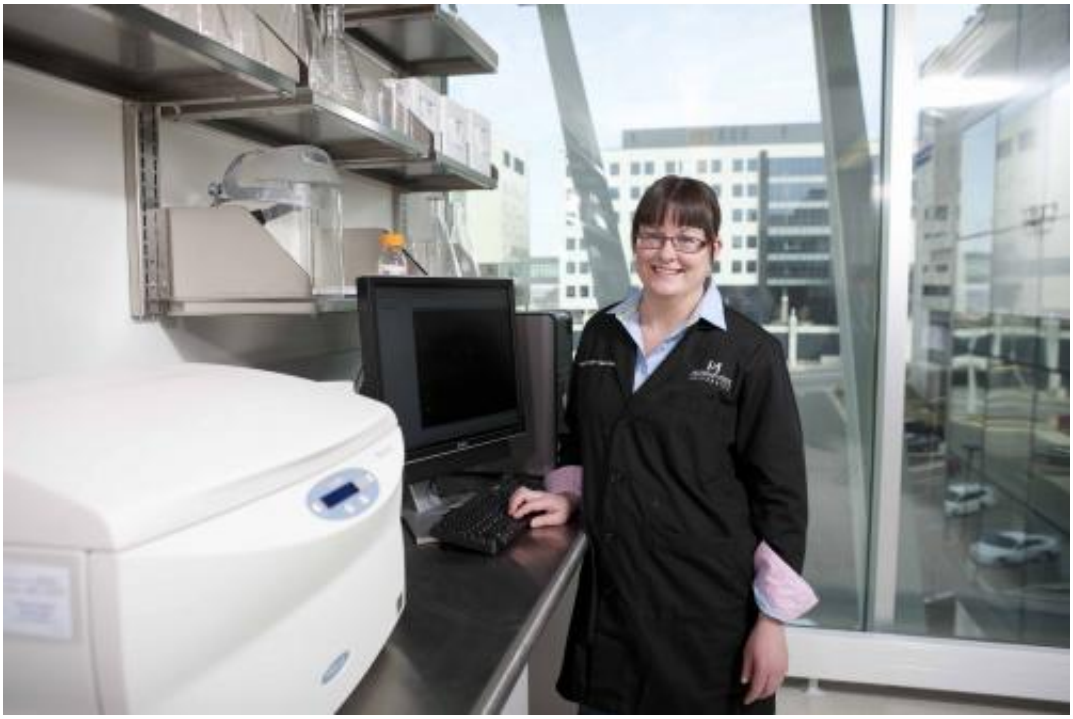

MSU experimental psychiatry professor Lena Brundin studies biological causes of suicidal behavior in order to find new ways to save lives.

(Medical Xpress)—Researchers have found the first proof that a chemical in the brain called glutamate is linked to suicidal behavior, offering new hope for efforts to prevent people from taking their own lives.

Writing in the journal Neuropsychopharmacology, Michigan State University's Lena Brundin and an international team of co-investigators present the first evidence that glutamate is more active in the brains of people who attempt suicide. Glutamate is an amino acid that sends signals between nerve cells and has long been a suspect in the search for chemical causes of depression.

"The findings are important because they show a mechanism of disease in patients," said Brundin, an associate professor of experimental psychiatry in MSU's College of Human Medicine. "There's been a lot of focus on another neurotransmitter called serotonin for about 40 years now. The conclusion from our paper is that we need to turn some of that focus to glutamate."

Brundin and colleagues examined glutamate activity by measuring quinolinic acid—which flips a chemical switch that makes glutamate send more signals to nearby cells—in the spinal fluid of 100 patients in Sweden. About two-thirds of the participants were admitted to a hospital after attempting suicide and the rest were healthy.

They found that suicide attempters had more than twice as much quinolinic acid in their spinal fluid as the healthy people, which indicated increased glutamate signaling between nerve cells. Those who reported the strongest desire to kill themselves also had the highest levels of the acid.

The results also showed decreased quinolinic acid levels among a subset of patients who came back six months later, when their suicidal behavior had ended.

The findings explain why earlier research has pointed to inflammation in the brain as a risk factor for suicide. The body produces quinolinic acid as part of the immune response that creates inflammation.

Brundin said anti-glutamate drugs are still in development, but could soon offer a promising tool for preventing suicide. In fact, recent clinical studies have shown the anesthetic ketamine—which inhibits glutamate signaling—to be extremely effective in fighting depression, though its side effects prevent it from being used widely today.

In the meantime, Brundin said physicians should be aware of inflammation as a likely trigger for suicidal behavior. She is partnering with doctors in Grand Rapids, Mich., to design clinical trials using anti-inflammatory drugs.

"In the future, it's likely that blood samples from suicidal and depressive patients will be screened for inflammation," Brundin said. "It is important that primary health care physicians and psychiatrists work closely together on this."

Provided by Michigan State University