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Researchers find novel drug target for the treatment of post-traumatic stress disorder

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A team of researchers at Mount Sinai School of Medicine has identified a promising therapeutic target in the brain that could lead to the treatment of post-traumatic stress disorder (PTSD). This is the first evidence of a potential drug target for the condition. The data were published in the September issue of the *Archives of General Psychiatry*.

Alexander Neumeister, MD, Associate Professor of Psychiatry at Mount Sinai School of Medicine, and colleagues collaborated with the Yale Positron Emission Tomography (PET) Center to evaluate 96 patients: 49 with PTSD; 20 who were exposed to trauma but did not have PTSD; and 27 healthy adults. The patients were injected with a radiotracer, which is a substance that helps provide a clear picture of serotonin 1B levels. Then they underwent PET scans that produced advanced biological images of their brains. The patients were injected with a radiotracer, during the PET scan.

The researchers found that serotonin 1B levels were substantially lower in the group of patients diagnosed with PTSD than in patients who did not have PTSD, and slightly lower in the patients who had been exposed to trauma but did not have PTSD.

"Our research provides the first evidence of a novel mechanism in the brain, and sets the stage for the development of therapies that target serotonin 1B receptors, offering the potential to minimize the disabling effects of PTSD," said Dr. Neumeister. "Currently, the only medical treatment options for the nearly eight million American adults with

PTSD are anti-depressants and anti-anxiety medications, which show little benefit in improving the mental health of these patients."

When Dr. Neumeister and his team evaluated predictors to explain the reduction in serotonin 1B levels in PTSD, they examined each patients' age, age at first traumatic experience, number of traumatic experiences, sex, body mass index and co-morbid depression, which is found frequently in PTSD. They found that it was the age at first trauma that determined the reduction in 1B receptors and the severity of PTSD, establishing that trauma at a young age causes long-lasting neurobiological and psychological effects in survivors with PTSD.

"The patients in our study included victims of childhood abuse, domestic violence, and military veterans," said Dr. Neumeister. "For these patients and the millions like them, treatment with currently available medications or psychotherapy is often ineffective. Unfortunately, people with PTSD often have additional psychiatric illnesses such as major depression or may develop substance use problems as an avenue for relieving their symptoms. Our research opens new doors in understanding PTSD and developing treatments for it, and may provide hope for these severely ill patients to be well."

Provided by The Mount Sinai Hospital