Hippocampus
Researchers are looking for the origin of schizophrenia in the brain
Alterations are apparent directly after the first psychotic episode

The first episode of psychosis is considered to be an important stage in the manifestation of the disease, but so far little is known about what happens to the brain on a chemical level. The neuroscientists, Prof. Dr. Denise Manahan-Vaughan and Dr. Valentina Dubovyk from the Department of Neurophysiology at Ruhr Universität Bochum showed in an animal model that the expression of certain neurotransmitters in the brain changes both after the onset of psychosis and over a longer course of the disease. They published their findings in the journal Frontiers in Behavioral Neuroscience.

Key factors in the development of a psychosis

The first episode of a psychosis is usually followed by a stabilisation of the disease state. Malfunctioning in the regulatory circuit of the two neurotransmitter glutamate and GABA (gamma-aminobutyric acid) in the hippocampus - a main processing centre for sensory and cognitive information - are considered key factors in the development of psychosis. The two neuroscientists from the RUB therefore investigated, in more detail, how the expression of the receptors of these neurotransmitters changes in the course of the disease.

Manahan-Vaughan and Dubovyk used an animal model for their study in which the symptoms resemble those of a psychosis in humans. The researchers examined how the expression and distribution of metabotropic glutamate receptors (mGlu1, mGlu2/3 and mGlu5) and GABAergic receptors changed one week and three months after the first episode of psychosis in the hippocampus of the animals.

They found that, shortly after the onset of symptoms, there was a rapid change in receptor expression that resulted in a reduction in the excitability of the nerve cells in the hippocampus. With increasing time this changed into an increased excitability of the nerve cells associated with further changes in neurotransmitter receptor expression. These hippocampus-specific changes are likely to contribute to the development and stabilization of psychosis, the authors write in their paper.

Changes to the onset of disease set the course for later progress

"Our results indicate that the brain may exhibit an adaptive response at the beginning of the psychosis, which then reverses as the disease progresses," explains Prof. Dr. Denise Manahan-Vaughan. "This initial adaptation response could make the brain more susceptible to the stabilisation process of the disease," said Manahan-Vaughan.
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**Reference:**


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