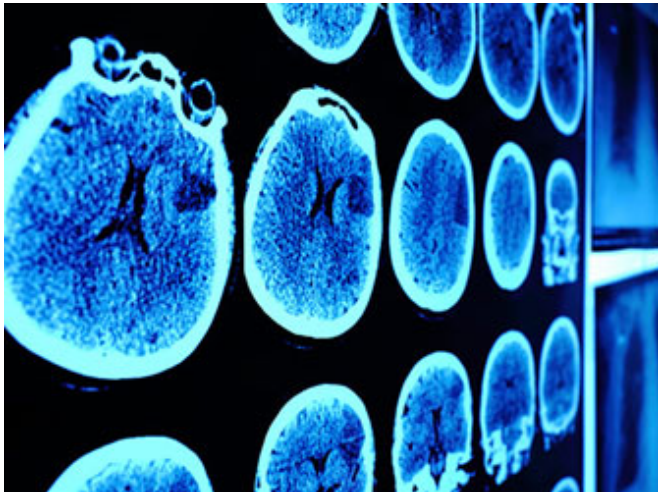


Depression study finds evidence of serotonin signal transduction disturbances

26 August 2015



Depression: evidence of serotonin signal transduction disturbances

Depression and anxiety disorders are the most common psychiatric disorders. Over the last few years, molecular brain imaging using Positron Emission Tomography (PET) has helped us to identify important mechanisms involved in the development and treatment of these disorders, particularly those associated with the serotonin neurotransmitter system. The drugs that are used for these conditions (SSRIs) were developed 30 years ago. To celebrate this anniversary, a team from MedUni Vienna, led by Siegfried Kasper, Director of the University Department of Psychiatry and Psychotherapy, has summarised the latest status of global research in this field in the leading journal, *The Lancet Psychiatry*.

"People laughed at us when we started treating depression with SSRIs (selective serotonin reuptake inhibitors) 30 years ago," explains Siegfried Kasper, who is also one of the pioneers of this method of treatment. "Today it is State of the Art and we are able to quantify disturbances in

serotonin signal transmission in the [brain](#) as the cause of depression and [anxiety disorders](#)." 80% of those suffering from depression are treated with SSRIs – the success rate is around 70%. Kasper: "Their quality of life is enhanced and there is a significant and lasting improvement in their motivation and mood."

Quantifiable mechanisms

Using Positron Emission Tomography (PET) from nuclear medicine, it is possible to quantify receptors, transporters and enzymes, in order to diagnose neurochemical differences in brain disorders but also to make a detailed analysis of the effects a drug has on the brain.

For example, it was also shown that the level of [serotonin transporter](#) (SERT) is greatly reduced in certain parts of the brain in patients with depression. At the same time, PET showed that SSRIs are a very effective pharmacological first-line therapy that brings about specific changes in the activity of the serotonin system. The serotonin transporter (SERT) is a cell membrane protein that facilitates return of the neurotransmitter serotonin (commonly known as the "happy hormone") into the cell. The activity of the serotonin transporter influences neural networks in the brain that are changed in depression. The serotonin transporter therefore also serves as a point of attack for the main antidepressants, such as SSRIs.

The current study is the result of a collaboration with the Neurobiology Research Unit of Copenhagen University Hospital. Rupert Lanzenberger's research group at the University Department of Psychiatry and Psychotherapy, under the direction of Siegfried Kasper, is one of the leading international research teams in the field of PET brain imaging in [psychiatric disorders](#). The underlying mechanisms for this were investigated in Vienna, in collaboration with the University Department of Radiology and Nuclear Medicine.

More information: "The serotonin transporter in psychiatric disorders: insights from PET imaging." *The Lancet Psychiatry*, 2015, Aug; 2(8):743-55.
www.ncbi.nlm.nih.gov/pubmed/26249305

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