

# Sex differences in the brain's serotonin system

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A new thesis from the Swedish medical university Karolinska Institutet shows that the brain's serotonin system differs between men and women. The scientists who conducted the study think that they have found one of the reasons why depression and chronic anxiety are more common in women than in men.

Serotonin is a brain neurotransmitter that is critical to the development and treatment of depression and chronic anxiety, conditions that, for reasons still unknown, are much more common in women than in men. A research group at Karolinska Institutet has now shown using a PET scanner that women and men differ in terms of the number of binding sites for serotonin in certain parts of the brain.

Their results, which are to be presented in a doctoral thesis by Hristina Jovanovic at the end of February, show that women have a greater number of the most common serotonin receptors than men. They also show that women have lower levels of the protein that transports serotonin back into the nerve cells that secrete it. It is this protein that the most common antidepressants (SSRIs) block.

“We don't know exactly what this means, but the results can help us understand why the occurrence of depression differs between the sexes and why men and women sometimes respond differently to treatment with antidepressant drugs,” says associate professor Anna-Lena Nordström, who led the study.

The group has also shown that the serotonin system in healthy women differs from that in women with serious premenstrual mental symptoms. These results suggest that the serotonin system in such women does not respond as flexibly to the hormone swings of the menstrual cycle as that in symptom-free women.

“These findings indicate that when developing antidepressants and anti-anxiety drugs, scientists should evaluate their effect on men and women separately, as well as their effects before and after menopause,” says Ms Nordström.

Source: Karolinska Institutet

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