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Altered purine metabolism linked to depression

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People suffering from major depressive disorder may have altered purine metabolism, according to a new study from the University of Eastern Finland and Kuopio University Hospital. Purines are nitrogenous compounds that serve as building blocks for DNA and they also play a role in cellular signalling, among other things.

The study found that in people with depression, purine metabolism is partially hyperactive. "This can be the body's way of combating the adverse effects of increased oxidative stress present in depression," says PhD student Toni Ali-Sisto, the first author of the study.

The findings were published in *Psychoneuroendocrinology*.

The study carried out by the University of Eastern Finland and Kuopio University Hospital involved 99 adults diagnosed with major depressive disorder and 253 non-depressed controls. The study participants' fasting serum concentrations of seven different purine cycle metabolites were analysed, and these concentrations were compared between the depressed and the healthy. The study also analysed whether the concentrations changed in people with depression during a follow-up of eight months, and whether remission of depression had an effect on the concentrations.

"Out of the purine metabolites we analysed, the concentrations of inosine and guanosine were lower, and the concentrations of xanthine were higher in people with depression than in healthy persons," Ali-Sisto

says.

The concentrations of several metabolites changed in people with depression during the follow-up, but no significant differences were observed between remitted and non-remitted groups. The use of anti-depressants or anti-psychotics did not affect the concentrations of purine metabolites.

Uric acid, the end product of purine metabolism, is produced from xanthine and it is an antioxidant combating the adverse effects of oxidative stress. Thus, the increased xanthine production may be the body's compensatory mechanism seeking to increase the production of uric acid in order to combat increased oxidative stress caused by depression.

Changes in purine metabolism have also been observed in association to low-grade inflammation and increased oxidative stress. Both of these are also associated with depression, but little research into the role of purine metabolism in depression has been conducted so far.

More information: Toni Ali-Sisto et al. Purine metabolism is dysregulated in patients with major depressive disorder, *Psychoneuroendocrinology* (2016). DOI: 10.1016/j.psyneuen.2016.04.017

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