

'Happy hormone' dwindles in fall, winter: Study

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Canwest News Service

OTTAWA - Canadian scientists have discovered that the human brain undergoes a seasonal depletion of the "happy hormone," a finding they believe explains why moods get darker as days get shorter.

State-of-the-art brain scans taken at different times of the year reveal that in the fall and winter, people have significantly higher levels of a protein that removes serotonin from the brain than they do in spring and summer.

Serotonin is a key brain chemical that manipulates mood, energy and sleep.

The finding, the first of its kind in the living human brain, "has the potential to explain seasonal changes in normal and pathological behaviours," the researchers report in the journal *Archives of General Psychiatry*.

It may lead to new ways to prevent or treat seasonal affective disorder, or SAD, a type of depression that affects an estimated two to six per cent of the population.

Sufferers have less energy, persistent feelings of sadness and trouble eating and sleeping.

"Winter blues can progress into a full depressive episode, with having symptoms even as severe as having thoughts around death," says Dr. Jeffrey Meyer, head of neurochemical imaging in mood disorders at the Toronto PET (positron emission tomography) Centre at the Centre for Addiction and Mental Health.

The research focused on something called a serotonin transporter, a protein that binds to serotonin and removes it from the spaces between brain cells.

The team studied 88 healthy men and women, aged 20 to 51, between 1999 and 2003. Each underwent one PET scan, which uses a tiny amount of a radiotracer, or dye that goes into the brain and sticks to the serotonin transporter sites.

They found higher levels of the protein in people who underwent scanning during fall and winter compared to those scanned in spring and summer.

They still don't know what causes the seasonal change, but they believe light exposure is important because the greatest levels of the serotonin-clearing protein occurred at the time of year when there were the lowest levels of light.

"In every region we measured, there was this seasonal pattern," Meyer said. "That's



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very different than what had been known before. And we've shown it in living humans."

"A lot of people complain about it (the winter blues). When it's a bit of black box and you don't really understand a mechanism for what people's complaints are, it's harder for people to feel that they're being heard.

"For people who suffer from this, it's comforting to have a mechanism that can be understood," Meyer said.

Major depressive disorder is the fourth-leading cause of death and disability worldwide, according to the World Health Organization. Meyer said the goal now is to use the imaging technology to develop strategies for preventing the winter blues, such as particular levels of light therapy.

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