Serotonin makes some people more susceptible to drug dependence than others

December 5 2014

A study by Sarah Bradbury, who graduates with a PhD in Psychology next week, shows that the development of drug addiction is related to brain levels of serotonin—a chemical created by the human body that is responsible for maintaining mood balance.

"People develop drug addiction due to changes in specific brain systems following repeated drug use, but not all drug users become addicted," says Sarah.

In her study, she found that serotonin levels during initial drug use are critical to whether someone becomes drug dependent or not. "The higher the serotonin levels someone has, the less likely they will become addicted," she says.

Sarah's research suggests that once drug use escalates and becomes frequent, the anti-addiction effect of serotonin is decreased. "Another brain chemical, dopamine, seems to be the critical determinant of drug addiction during this phase," she says.

There is a wealth of research associating dopamine with drug addiction. Until recently, drug addiction research has focused on this chemical, which helps control the brain's reward and pleasure centres.

Addiction research is increasingly investigating a variety of brain chemicals in a bid to further understanding of the disease, and with the aim of producing pharmacotherapies to help prevent and treat drug addiction.

Sarah's results suggest that pharmacotherapies that increase serotonin levels could be investigated as a way of preventing drug addiction. While her research focused on the drugs cocaine and MDMA (the active ingredient in ecstasy), she says the findings are applicable to a wide range of drug addictions.

Provided by Victoria University