

New research explores role of serotonin in decision-making behaviour

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New research by scientists at the University of Cambridge suggests that the neurotransmitter serotonin, which acts as a chemical messenger between nerve cells, plays a critical role in regulating emotions such as aggression during social decision-making.

Serotonin has long been associated with social behaviour, but its precise involvement in impulsive aggression has been controversial. Though many have hypothesised the link between serotonin and impulsivity, this is one of the first studies to show a causal link between the two.

Their findings highlight why some of us may become combative or aggressive when we haven't eaten. The essential amino acid necessary for the body to create serotonin can only be obtained through diet. Therefore, our serotonin levels naturally decline when we don't eat, an effect the researchers took advantage of in their experimental technique.

The research also provides insight into clinical disorders characterised by low serotonin levels, such as depression and obsessive compulsive disorder (OCD), and may help explain some of the social difficulties associated with these disorders.

This research, funded by the Wellcome Trust and the Medical Research Council, suggests that patients with depression and anxiety disorders may benefit from therapies that teach them strategies for regulating emotions during decision making, particularly in social scenarios.

The researchers were able to reduce brain serotonin levels in healthy volunteers for a short time by manipulating their diet. They used a situation known as the 'Ultimatum Game' to investigate how individuals with low serotonin react to what they perceive as unfair behaviour. In this game one player proposes a way to split a sum of money with a partner. If the partner accepts, both players are paid accordingly. But if he rejects the offer, neither player is paid.

Normally, people tend to reject about half of all offers less than 20-30% of the total stake, despite the fact that this means they receive nothing - but rejection rates increased to more than 80% after serotonin reductions. Other measures showed that the volunteers with serotonin depletion were not simply depressed or hypersensitive to lost rewards.

PhD student Molly Crockett, a Gates Scholar at the University of Cambridge Behavioural and Clinical Neuroscience Institute, said: "Our results suggest that serotonin plays a critical role in social decision-making by normally keeping aggressive social responses in check. Changes in diet and stress cause our serotonin levels to fluctuate naturally, so it's important to understand how this might affect our everyday decision-making."

Source: University of Cambridge

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