Psilocybin has treatment potential for a range of psychiatric conditions but remains poorly understood, says study

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Credit: Florey Institute of Neuroscience and Mental Health

Medicinal psilocybin may prove to be an untapped therapeutic resource for a variety of psychiatric conditions identified by researchers at The

Florey Institute of Neuroscience and Mental Health.

In a paper published in the *Journal of Neurochemistry*, Florey researchers found that despite a recent "research explosion" into the naturally occurring psychoactive substance found in magic mushrooms, how it works remains poorly understood and needs to be subject of rigorous scientific research.

Lead author James Gattuso said the team, led by Dr. Thibault Renoir at The Florey, systematically reviewed 34 preclinical scientific papers published since 2000 to help shape the future direction of psilocybin research.

"Psilocybin shows the greatest efficacy for mood disorders such as depression and anxiety. It also shows exciting therapeutic potential for obsessive compulsive disorder, addiction, and fear-related disorders such as post-traumatic stress disorder and phobias."

"Psilocybin has been found to be as safe if not safer than ketamine, which is FDA-approved for treatment-resistant depression. However, when taken recreationally, psilocybin is not only illegal but can carry significant health risks and concerns particularly for people with existing mental health conditions," Mr. Gattuso said.

He said future research should explore safe and long-term effects of psilocybin treatment.

The review identified a variety of important future research directions, noting researchers could consider:

- Investigating how psilocybin affects the gut-brain axis which enables two-way biochemical signaling to take place between the gastrointestinal tract and the central nervous system and is known

to be relevant to several neuropsychiatric conditions.
- Studying whether any benefits are due to psilocybin's hallucinogenic properties or to other physiological factors.
- Working with genetically-engineered animal models as these allow researchers to understand the complex interaction between genes and environment and their impacts on behavior.

"We focused on preclinical psilocybin research because such studies can tightly control behavioral experiments, are less impacted by placebo effects and enable biochemical processes to be understood," Mr. Gattuso said.

The researchers also found that psilocybin can robustly increase the strength of synaptic connections while also altering the way key brain networks 'talk' to each other.

Psilocybin was reclassified by the Therapeutic Goods Administration in Australia in July this year to allow prescription for patients with treatment-resistant depression, while the American Food and Drug Administration has classified it as a "breakthrough therapy."

The researchers concur that a limitation of the field is that the studies that were systematically reviewed contained large variability in study design such as the disease model, dosages used and behavioral tests applied. Therefore, much more research is needed to identify new treatments, including psilocybin and related drugs, for a variety of major psychiatric disorders.

More information: James J. Gattuso et al, Psilocybin as a lead candidate molecule in preclinical therapeutic studies of psychiatric disorders: A systematic review, *Journal of Neurochemistry* (2023). DOI: 10.1111/jnc.16017

Provided by Florey Institute of Neuroscience and Mental Health