

# The age of mushrooms is upon us in medicine

Psychedelic medications, including mushrooms, are on the verge of becoming mainstream practice.

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Some of us will remember turn-on-tune-in-drop-out Timothy Leary, the psychologist whose work on then-legal psychedelics in the 1960s got him fired from Harvard University. His subsequent arrest and the government's attempt to stamp out the counterculture anti-Vietnam movement led to the US federal government banning the manufacture and sale of all psychedelic drugs.

But the tide has turned, and psychedelic drugs are currently having a huge resurgence.

## Indications

Psychedelics will soon be routine for treating opioid addiction,<sup>1</sup> PTSD,<sup>2</sup> and refractory depression,<sup>3</sup> as well for use in palliative care settings.<sup>4</sup>

## Mycology review

*Fungi* is the generic term for the group of eukaryotic organisms that include molds, yeast, and mushrooms. Mushrooms are spore-bearing fruit of the fungus and the roots are called *mycelium*. Mycelium are thread-like branchings that can become enormous. A mycelium mat in Oregon was found to be 2500 acres in size.<sup>5</sup> What is so fascinating about mycelium is that fungi branched off from the human evolutionary tree perhaps 600 million years ago. At this point, animals internalized their digestive systems but fungi left theirs externalized. These mycelium threads in the ground are separated from the external world, teeming with bacteria and viruses, by a skin only one cell thick (animal skin, in contrast, is many cell layers thick). There is a constant war between the mycelia who need to eat the microorganisms and the microorganisms who want to eat the mycelia—so that fungi have extensive antiviral and antibacterial properties that are now beginning to be investigated. Mycelia are the decomposers of the world's forests.

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*This article has been peer reviewed.*

The reason that antifungal agents in medicine are so toxic in humans is that fungi are much closer to humans than bacteria.

## Pharmacology review

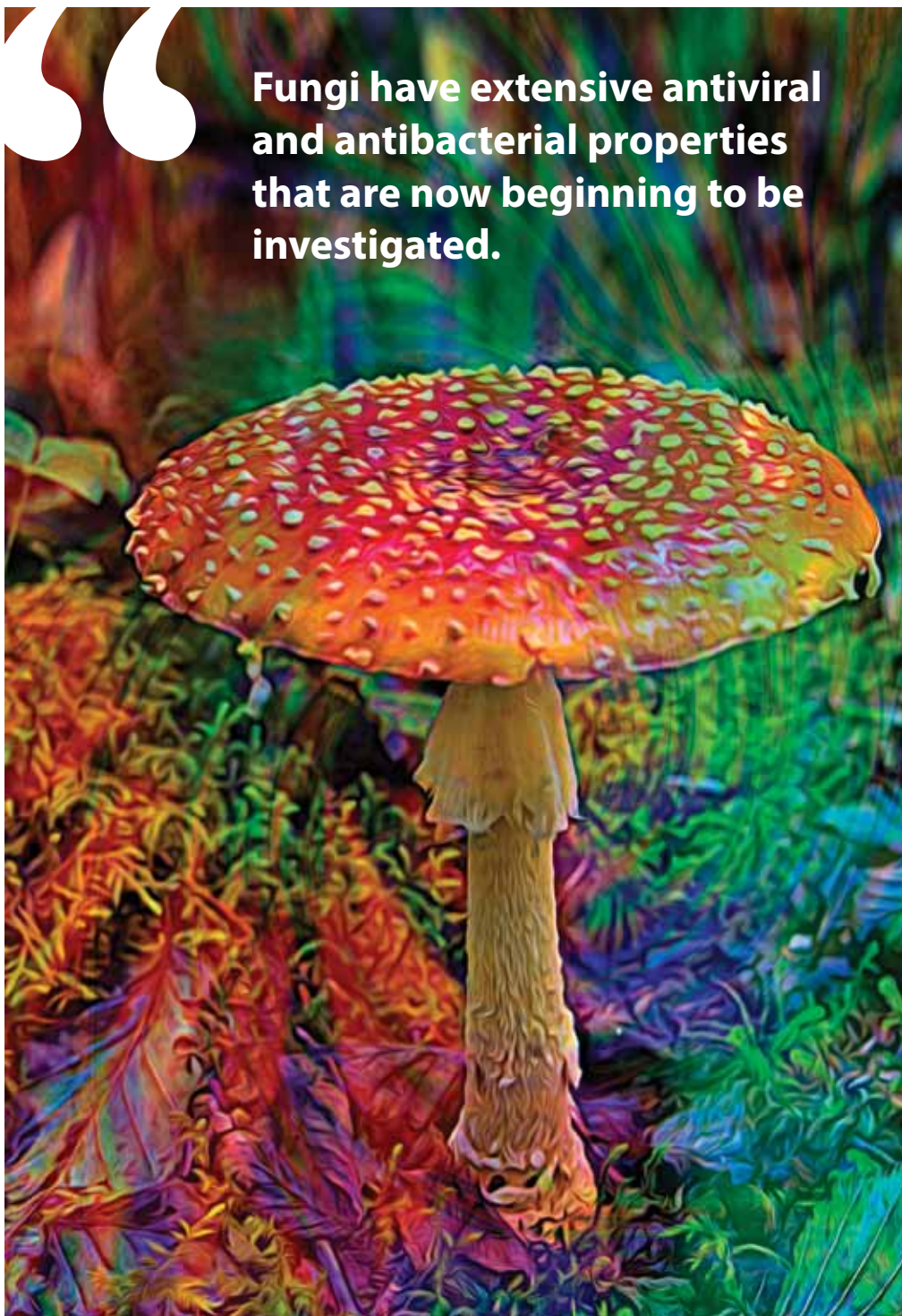
Psychedelics—whether one is referring to psilocybin (found in more than 200 species of mushrooms), mescaline (from the peyote cactus), LSD (a refined form of lysergic acid extracted from the ergot fungus), or ayahuasca (a brewed mixture of substances from vines traditionally found in the Amazon basin)—seem to affect serotonin and/or monoamine oxidase (MAO) receptors in the brain. As research ramps up there undoubtedly will be other receptors with cool-sounding acronyms. These drugs cause the brain to light up on an fMRI. As this “neuronal crosstalk” increases, so does the patient’s “ego dissolution,” usually with accompanying feelings of bliss and a sense of oneness.

The uses that seem to be generating the most press are for opioid and smoking addiction, end-of-life care issues, refractory depression, and PTSD. In October 2018, the US Food and Drug Administration granted “breakthrough therapy” designation to psilocybin for depression. In May 2019, Denver, Colorado, voters passed a ballot to decriminalize psychedelic mushrooms. This year US congresswoman Alexandria Ocasio-Cortez filed legislation to remove the legal restrictions surrounding clinical research of these compounds in the name of assisting veterans with PTSD.

The guru of mycology, Paul Stamets,<sup>6</sup> who lives nearby on the Olympic Peninsula in Washington, has a very interesting evolutionary take on this subject, which is basically a promotion of the older Stone Age hypothesis of Terence McKenna.<sup>7</sup> In essence, it says that something amazing happened to the homo sapiens brain about 200 000 years ago; a massive increase in cognitive ability allowed humans to conquer the planet by cooperating. This theory goes on to say that early hominids coming out of the trees and onto the savannah came across large amounts of mushrooms growing like weeds from animal dung. Over many millennia these early humans got to know which mushrooms were for calories, which ones were poisonous, and which ones were “magic”—that is, contained psilocybin. As McKenna writes, “Homo sapiens ate its way to a higher

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consciousness,” and, “It was at this time that religious ritual, calendar making, and natural magic came into their own.”<sup>7</sup>

### The future

The trend to acceptance of these drugs is now about where cannabis was 10 years ago, but

things change faster now. German millionaire Christian Angermayer has started a company called Compass Pathways that is buying the intellectual property rights for the manufacture of psychedelics with the backing of Silicon Valley billionaire Peter Thiel. Food guru Michael Pollan has a recent book on the virtues of the

psychedelics.<sup>8</sup> The Multidisciplinary Association for Psychedelic Studies run by researcher and TED Talks speaker Rick Doblin is a not-for-profit research organization dedicated to psychedelics also getting a lot of attention.<sup>9,10</sup>

The age of mushrooms is upon us! ■

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