The battle against hard-to-treat fungal infections

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Conidiophores with conidia of the microscopic fungi Aspergillus oryzae under light microscope. Credit: Yulianna.x / Wikimedia / CC BY-SA 4.0

Systemic fungal infections are much rarer than other illnesses, but they are potentially deadly, with limited options for treatment. In fact, fungi are becoming increasingly resistant to the few drugs that are available, and infections are growing more common. A cover story in *Chemical &*

Engineering News, the weekly newsmagazine of the American Chemical Society, details how scientists are working to improve our antifungal arsenal.

At present, there are only four types of antifungal drugs approved by the U.S. Food and Drug Administration (FDA), and some infections are resistant to those drugs, making surgery the only option for treatment, writes Senior Correspondent Bethany Halford. Fungi can be found almost everywhere, but only a few hundred species are able to infect humans, and most people's immune systems can fight them off. However, people with compromised immune systems (for instance, cancer patients being treated with certain chemotherapies) are at a higher risk for developing fungal infections. The FDA has not approved a drug from a new antifungal class in 20 years, and the ones available all have downsides, including drug resistance and kidney toxicity. This dearth of treatments has doctors concerned that the problem will only get worse as time goes on.

Creating a new antifungal drug is challenging because of the biological similarities between humans and fungi. Many molecules that are harmful to fungi are also harmful to people. Experts say that exploiting the differences between humans and fungi is key to developing new treatments; for example, fungal cells have walls, but human cells do not. In addition to developing new treatments, pharmaceutical researchers are working to improve established antifungal drugs to make them more potent and have fewer side effects. Although scientists and doctors are hopeful that new antifungals will be approved, establishing clinical trials has proven challenging because most of the people who get fungal infections are already very sick. However, the COVID-19 pandemic could change how pharmaceutical companies think about therapies for infectious diseases, prioritizing them in the future.

More information: "The Fight Against Fungi,"

cen.acs.org/pharmaceuticals/dr … ngi-antifungal/99/i7

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