

# Cryptococcus infections misdiagnosed in many AIDS patients

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Most AIDS patients, when diagnosed with a fungal infection known simply as cryptococcosis, are assumed to have an infection with *Cryptococcus neoformans*, but a recent study from Duke University Medical Center suggests that a sibling species, *Cryptococcus gattii*, is a more common cause than was previously known.

The difference between these strains could make a difference in treatment, clinical course, and outcome, said Joseph Heitman, M.D., Ph.D., senior author of the study and chair of the Duke Department of [Molecular Genetics](#) and Microbiology.

The study was published Sept. 1 in [PLoS Pathogens](#).

The study emphasizes that health professionals need more careful recording of the cryptococcal species to understand different clinical courses and possibly to change [treatment strategies](#).

Researchers at Duke University Medical Center discovered that in the Los Angeles area, over 12 percent of [AIDS patients](#) diagnosed with *Cryptococcus* were infected with *C. gattii*, much higher than earlier studies, suggesting only about 1 percent have *C. gattii*. The researchers based these figures on molecular testing of fungal DNA barcodes.

This discovery comes at the same time as a *C. gattii* outbreak is expanding in the Pacific Northwest, spreading southward from Vancouver, British Columbia, through Washington, Oregon, and into

northern California. Molecular testing is helping both [health officials](#) and scientists gain a picture of how a formerly tropical fungus could find new territory, in temperate climates, for infection.

"Importantly, we found that isolates causing the outbreak and those infecting AIDS patients are completely different (VGII vs. VGIII)," said co-lead author Edmond Byrnes, Ph.D., a recently graduated student in the Heitman laboratory.

Wenjun Li, Ph.D., also a co-lead author and researcher in the Heitman laboratory, noted that, based on the fungal isolate samples taken from patients, those with *C. gattii* may experience resistance to the commonly used "azole" drugs that combat fungal infections, and clinicians might be better aware of potential treatment problems if they knew the species.

Because cryptococcal strains are responsible for over 620,000 deaths annually and responsible for one-third of all AIDS deaths, this species distinction may be of public health importance.

"There may be an unrecognized health burden in AIDS patients attributable to *C. gattii* rather than *C. neoformans*," Heitman said.

He said that while a simple test is all that is needed to distinguish the two strains, "few clinical microbiology labs or hospitals, even in developed countries, are equipped to distinguish *C. neoformans* from *C. gattii*."

Heitman said that he doesn't believe that there is any human-to-human transmission of *C. gattii*, but rather, patients are being exposed in the environment. For example, one AIDS patient from San Diego had an isolate that was traced back to a type of tree, which is a common place to find *C. gattii*, in Australia and elsewhere.

"This study clearly illustrates that AIDS patients in certain areas of the

world might be infected by two different cryptococcal species," said John R. Perfect, M.D., professor of medicine at Duke University Medical Center. "Although the outcome of infection in comparison between the two species remains uncertain, this study shows that we need to carefully control for potential differences and study them further."

Medical management might be more complicated for *C. gattii* compared to *C. neoformans*, including the possibility of azole drug resistance and the formation of cryptococcomas in the central nervous system that can be difficult to treat and that cause abscesses. "Based on the prevalence we found, it makes sense to pursue further clinical studies, not just to find out the species, but also the molecular type, so we can learn all we can about how this pathogen is travelling and evolving," Heitman said.

Provided by Duke University Medical Center

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