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Trends in Medical Mycology (TIMM) Congress, Athens October 2023

Fungi in the body may contribute to development of Alzheimer’s disease and influence the outcome of Covid-19.

The international meeting of the European Confederation of Medical Mycology meeting at the Megaron Athens International Conference Centre reported two fundamental breakthroughs in the understanding of how fungi affect human disease.

David Corry explained how the common fungus *Candida albicans* enters the brain from the blood and how the brain defends itself from this unique fungal infection. His group discovered that *Candida* can colonise the gut of mice where it picks up gut bacteria and spreads both to the brain to initiate a permanent brain infection. This caused the mice to have poor memory and severe anxiety. They also showed that *Candida*-bacterial co-infection in the brain of human patients with Alzheimer’s Disease. This finding points to a fungus as a potential microbiological cause of Alzheimer’s and related neurodegenerative diseases and suggests new ways to combat *Candida*-related brain disease.

Iliyan Iliev revealed that *Candida albicans*, thrives in the gut of patients with severe cases of COVID-19. These fungi worsen the excessive inflammation that characterizes the disease and lead to long-lasting changes the immune system. The findings suggest that specialized treatments may benefit a specific group of patients. Their study found that patients with severe COVID-19 had more *Candida albicans* yeast in their intestines, leading to white blood cells flooding into the lungs worsening lung damage. COVID-19 patients who recovered from severe disease, but had lingering symptoms post viral recovery maintained immune memory of these fungi for up to a year after COVID-19 infection. They found a cytokine called IL-6 that these fungi induce, activate white blood cells (neutrophils) and antifungal antibodies. Blocking IL-6 in the patients or in mice dampened this immunological memory and related immune activation. While the study implications for treatment are not immediate, they open doors for personalized therapy and potential new insights into long COVID-19 and other infectious diseases.

Neil Gow, the new President of ECMM said... “these two lectures make us think differently about the ways in which fungi can contribute to complex diseases such as Covid-16, cancer and Alzheimer’s Disease.”. Martin Hoenigl, the immediate past President of ECMM said...”the report that overgrowth of *Candida* in the gut triggering specific immune responses to *Candida* colonizers, which then worsen acute and long term outcomes of COVID is ground-breaking. Mounting evidence suggests that the gut and its fungal colonizers may play an important causative role in the development of neurocognitive disease, as shown in a number of recent animal models, while associations have previously also been shown in human populations, triggering the necessity of further research in this area”



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