Fungus and Mice: Could They Provide Answers About Immunity in Those With HIV/AIDs?

Since the discovery of HIV/AIDs in the United States in the 1970s it has been a hot topic of research in regards to immunity, and potential treatments to remedy symptoms. One Oklahoma State University professor Dr. Karen Wozniak has contributed to this research through the study of interactions between pulmonary immune system cells, and a fungus known as *Cryptococcus neoformans,* which is known to be the leading cause of fungal meningitis (Hawkins et al. 2021). In her collaborative study Dr. Wozniak uses mice to track how *C. neoformans* interacts with and infects pulmonary phagocytes such as alveolar macrophages. Initially they hypothesized that “ pulmonary phagocyte subsets would interact differently with *C. neoformans*, and the difference may be due to differentially expressed genes and signal transduction pathways activated or repressed in each subset following interaction. . .”(Hawkins et al. 2021). Meaning that they were specifically looking for how immune cells in the lungs interacted with the fungal-meningitis-causing agent known as *C. neoformans*. Also, they said they believed that the cause of these interactions could be due to which genes were expressed when these interactions occur. They reference past studies that have been done on the topic, but note that “few studies have examined how individual [immune cells] interact with *C. neoformans*” (Hawkins et al. 2021). Therefore the purpose of their study is to see how these interact with each other, and if different pulmonary immune cells interact differently than others. In the end they found that different types of pulmonary immune cells do interact differently with *C. neoformans*, and that there is a sexual determining factor for these interactions (Hawkins et al. 2021). In their study they found a significant difference in the fungal growth numbers between male and female cells. Furthermore, they found that the fungus affects multiple metabolic pathways in an organism due to differential gene expression caused by *C. neoformans* (Hawkins et al. 2021). These findings are imperative to the ongoing research surrounding HIV/AIDs. The results from Dr. Wozniak’s 2021 study provides key information on what future research could be done in this particular field. It also provides hope for the potential creation of therapies to remedy symptoms in those with fungal meningitis

**References:**

Hawkins, A; Determann, B; Nelson, B; Wozniak, K. (2021). Transcriptional Changes in Pulmonary Phagocyte Subsets Dictate the Outcome Following Interaction With The Fungal Pathogen Cryptococcus neoformans. Frontiers in Immunology. 12. 722500. 10.3389/fimmu.2021.722500.