EXPLORING *IN VITRO* INTERACTION EXPERIMENTS WITH SPORE SURFACE MUTANTS OF *MUCOR LUSITANICUS*

Vanda Kovács[1,2*], Anna Molnár[1,2], Karina Kiss[1,2], Tammam Ksa[1,2], Csilla Szebenyi[1,2], Mónika Homa[1,2,] Csaba Vágvölgyi[1], Tamás Papp[1,2]

[1]Department of Microbiology, Faculty of Science and Informatics, University of Szeged, HUNGARY
[2]HUN-REN-SZTE-Research Group on Patomechanism of Fungal Infections, HUNGARY

*corresponding author: kovacsvanda1210@gmail.com

The majority of species belonging to the order Mucorales primarily exhibit a saprophytic lifestyle, in which they mainly utilize decomposed plant and animal matter. However, there are also plant-pathogenic species among them, primarily responsible for damaging agricultural crops. Furthermore, certain species can be considered opportunistic human pathogens, capable of inducing life-threatening infections known as mucormycosis. The objective of our study was to conduct *in vitro* interaction experiments involving the *hsbA* mutant strain of *Mucor lusitanicus*. The HsbA protein family comprises antigenic proteins present on the fungal cell wall, which play roles in adhesion to surfaces and penetration, particularly in the early stages of infection. During the interaction experiments, we employed J774.2 mouse macrophage-like monocytic cells, in which we performed phagocytosis and pre-treatment killing assays. The efficiency of phagocytosis was determined using flow cytometry and monitoring the number of phagocytosed cells, while during the pre-treatment killing assays, we assessed the effectiveness of fungal spore killing by counting colony-forming units (CFUs). The phagocytosis index and phagocytosis capacity of the MS12-*ΔhsbA5+pyrG* mutant strain varied significantly from those of the control strain, while the pre-treatment killing results showed a higher survival rate of the MS12-*ΔhsbA5+pyrG* strain compared to the control strain. Our results could significantly contribute to understanding the immune response elicited by mucormycosis, uncovering pathogenic mechanisms, and potentially aiding in the development of more effective therapeutic methods. The research was supported by the projects NRDI K131796, ELKH 2001007 and NRDI TKP-2021-EGA-28 and supported by the ÚNKP-23-4 -SZTE-649 New National Excellence Program of the Ministry for Innovation and Technology from the source of the national research, development, and innovation fund.