Virulent strain of *Lichtheimia corymbifera* shows increased phagocytosis by macrophages as revealed by automated microscopy image analysis.

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Details

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Abstract

Lichtheimia corymbifera is a ubiquitous soilborne zygomycete fungus, which is an opportunistic human pathogen in immunocompromised patients. The fungus can cause life-threatening diseases by attacking the lung during early stages of invasion and by disseminating during later phases causing systemic infection. Since infections have drastically increased during the last decades, it is a major goal to investigate the mechanisms underlying pathogenicity of *L. corymbifera*. One of the first barriers, which the fungus needs to cope with in the lung tissue, is phagocytosis by

alveolar macrophages. Here, we report on phagocytosis assays for murine alveolar macrophages co-incubated with resting, swollen and opsonised spores of a virulent and an attenuated *L. corymbifera* strain. A major finding of this study is the significantly increased phagocytosis ratio of the virulent strain if compared to the attenuated strain. We quantify the phagocytosis by performing automated analysis of fluorescence microscopy images and by computing ratios for (i) fungal phagocytosis, (ii) fungal adhesion to phagocytes and (iii) fungal aggregation and spore cluster distribution in space. Automation of the image analysis yields objective results that overcome the disadvantages of manual analyses being time consuming, error-prone and subjective. Therefore, it can be expected that automated image analysis of confrontation assays will play a crucial role in future investigations of host-pathogen interactions.

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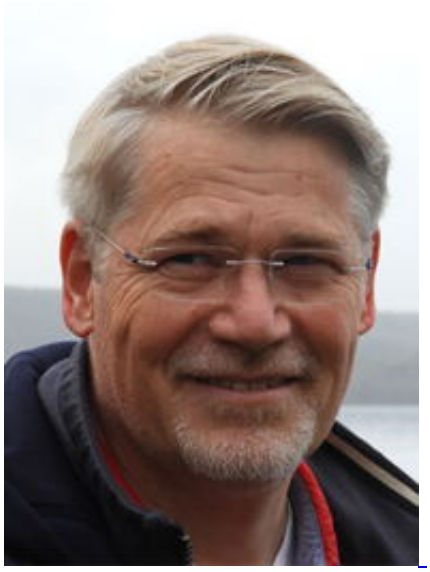

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