Purification and characterization of a mycelial catalase from Scedosporium boydii, a useful tool for specific antibody detection in patients with cystic fibrosis

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Résumé en anglais	Scedosporium boydii is an opportunistic filamentous fungus which may be responsible for a wide variety of infections in immunocompetent as well as immunocompromised individuals. This fungus belongs to the Scedosporium apiospermum species complex which usually ranks second among the filamentous fungi colonizing the airways of patients with cystic fibrosis (CF) and that may lead to allergic broncho-pulmonary mycoses, sensitization or respiratory infections. Upon microbial infection, host phagocytic cells release reactive oxygen species (ROS), such as hydrogen peroxide, as part of the antimicrobial response. Catalases are known to protect pathogens against ROS by detoxification of the hydrogen peroxide. Here, we investigated the catalase equipment of S. boydii, one of the major pathogenic species in the S. apiospermum species complex. Three catalases were identified and the mycelial catalase A1 was purified to homogeneity by a three-step chromatographic process. This enzyme is a monofunctional tetrameric protein, of 460 kDa, consisting of four 82-kDa glycosylated subunits. The potential interest of this enzyme in serodiagnosis of S. apiospermum infections was then investigated by ELISA, using 64 sera from CF patients. Whatever the species involved in the S. apiospermum complex, sera from infected patients were clearly differentiated from sera from patients with an Aspergillus fumigatus infection, or from CF patients without clinical and biological signs of a fungal infection and without any fungus recovered from sputum samples. These results suggest that catalase A1 is a good candidate for the development of an immunoassay for serodiagnosis of infetions caused by the S. apiospermum complex in patients with CF.
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