The glycolytic enzyme enolase represents a plasminogen-binding protein on the surface of a wide variety of medically important fungal species.

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Details

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Abstract

Allergies are an increasing issue in human health and can, eventually, cause severe anaphylactic shock. Aspergillus fumigatus and Candida albicans are leading causes of life-threatening invasive fungal infections in immunocompromised patients, but can also cause severe allergic responses in otherwise healthy individuals. The glycolytic enzyme enolase is known as a major allergen despite its function in intracellular metabolism. Therefore, its presentation on surfaces of different fungal species was investigated by using antibodies raised against recombinant enolases from A. fumigatus and C. albicans. Examination of antibody specificity revealed cross-reactivity to cell-free extracts from Aspergillus terreus, Aspergillus flavus, Aspergillus nidulans and Candida glabrata, but not against any of the three human enolases. Antibody specificity was further confirmed by hybridization with other recombinant fungal enolases, where the antibodies recognized different subsets of fungal enolases. When surface presentation of enolase was tested on intact fungal cells, a positive staining was obtained with those antibodies that also recognized the enzyme from

the respective cell-free extract. This implies a general surface presentation of this glycolytic enzyme among fungal species and provides hints for its predominant recognition as an allergen. Additionally, A. fumigatus and C. albicans enolase bound to human plasminogen, which remained accessible for the plasminogen activator uPA. This implies a potential role of enolase in the invasion and dissemination process during fungal infections.

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