

Comparision of Neutrophil Response to Curvularia, Bipolaris and Aspergillus Species

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Abstract : Members of the genera *Curvularia* and *Bipolaris* are closely related melanin producing filamentous fungi; both of them have the teleomorph states in genus *Cochliobolus*. While *Bipolaris* species infect only plants and may cause serious agriculture damages, some *Curvularia* species was recovered from opportunistic human infections. The human pathogenic species typically cause phaeohyphomycoses, i.e. mould infections caused by melanised fungi, which can manifest as invasive mycoses with frequent involvement of the central nervous system in immunocompromised patients or as local infections (e.g. keratitis, sinusitis, and cutaneous lesions) in immunocompetent people. Although their plant-fungal interactions have been intensively studied, there is only little information available about the human pathogenic feature of these fungi. The aim of this study was to investigate the neutrophil granulocytes' response to hyphal forms of *Curvularia* and *Bipolaris* in comparison with the response to *Aspergillus*. In the present study *Curvularia lunata* SZMC 23759 and *Aspergillus fumigatus* SZMC 23245 both isolated from human eye infection, and *Bipolaris zeicola* BRIP 19582b isolated from plant leaf were examined. Neutrophils were isolated from heparinised venous blood of healthy donors with dextran sedimentation followed by centrifugation over Ficoll and hypotonic lysis of erythrocytes. Viability and purity of the cells were checked with trypan blue and Wright staining, respectively. Infection of neutrophils was carried out with germinated conidia in a ratio of 5:1. Production of hydrogen peroxide, superoxide anion, and nitrogen monoxide was measured both intracellularly and extracellularly in response to the germinated spores with or without the supernatant and after serum treatment. ROS and NOS production of neutrophils in interaction with the three fungi were compared. It is already known that *Aspergillus* species induce ROS production of neutrophils only after serum treatment. Although, in case of *C. lunata*, serum opsonisation also induced an intensive production of reactive species, lower level of production was measured in the lack of serum as well. After interaction with the plant pathogenic *B. zeicola*, amount of reactive species found to be similar with and without serum treatment. The presence of germination supernatant decreased the reactive species production in case of each fungus. Interaction with *Curvularia*, *Bipolaris* and *Aspergillus* species induced different response of neutrophils. It seems that recognition of *C. lunata* and *B. zeicola* is independent of serum opsonisation, albeit it increases the level of the produced reactive species in response for *C. lunata*. The study was supported by the grant LP2016-8/2016.

Keywords : *Curvularia*, neutrophils, NOS, ROS, serum opsonisation

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