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Title of thesis: Studies on molecular mechanisms of host-pathogen interactions in aspergillosis.

Abstract

Aspergillus fumigatus (Afu), an opportunistic fungal pathogen, infects the human host by inhalation of airborne conidia. Adhesion of fungal conidia to host cells and extracellular matrix components associated with host tissue surfaces is the primary step in pathogenesis and is essential for dissemination of infection. In view of multifactorial nature of conidial adhesion, relevance of adhesins for understanding pathogenesis, and plausible application of anti-adhesins for prevention and therapy of aspergillosis, bioinformatic (**Probability of being adhesin determined for all proteins of Afu**), genomic (**2 novel adhesions, AfCalA and Mp1 have been cloned, expressed and characterized**) and proteomic (**7 new adhesins identified using 2-D proteomics**) approaches were used for global screening of adhesins of *Afu.* AfCalA and Mp1 were also implicated in allergic manifestations by examining their immunoreactivity with allergic bronchopulmonary aspergillosis (ABPA) patient sera.

Genome of *Aspergillus fumigatus* has been sequenced but information about its transcriptome and proteome is still not complete. To identify *Afu* genes and to validate the sequences predicted *in-silico*, *Afu* transcripts (ESTs) expressed under normal growth conditions of fungus were studied. 52 ESTs and the complete CDS for tetratricopeptide submitted to NCBI database).

To understand the mechanism of drug action/resistance in *Afu* and to facilitate identification of regulatory switches and novel drug targets, global expression profiling of *Afu* genes (using **Microarray and Real-time PCR**) and proteins (using **2-D gel electrophoresis**) in response to its exposure to three different antifungal agents was achieved.