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Cryo-stress of filamentous fungi

To retain microbial diversity in a sustainable manner, it is important to archive microorganisms for a long period of time, e.g. by cryoconservation. During this process, low temperatures damages cellular components. Some organisms evolved protective mechanisms to reduce defects resulting from cold stress. Recently, it was shown that dehydrin-like genes were induced, as a stress response in *Aspergillus* species at low temperatures. These dehydrins could be an important part of the physiological stress response of Aspergillus to resist low temperatures. Beyond these dehydrins, little is known about the adaptation to cold and cryo stress in Ascomycetes.

To identify the key processes induced at cold stress, the proteome of the model organism *Aspergillus nidulans* will be analyzed by 2D-gel electrophoresis and LC-MS/MS methods. Due to the low temperature - resulting in a low availability of energy to build up new proteins -another focus will be the investigation of post-transcriptional changes, particularly the acetylome. This work will be complemented by transcriptional profiling of the cold stress response in *A. nidulans*. Interesting genes/proteins will be further analyzed by molecular biology techniques. Most likely, the generated data may support the development of new approaches to optimize the cryopreservation of fungi and may reveal putative anti-freezing-proteins or new osmoprotectants to optimize the long-term storage of fungi.

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Start of PhD

October 1, 2013

Doctoral Disputation

March 22, 2019