**Publication 2:**

**Reverberi, M., Fabbri, A.A., Zjalic, S. et al. Antioxidant enzymes stimulation in Aspergillus parasiticus by Lentinula edodes inhibits aflatoxin production. Appl Microbiol Biotechnol (2005) 69: 207. https://doi.org/10.1007/s00253-005-1979-1**

**Abstract**

Biosynthesis of aflatoxins, toxic metabolites produced by Aspergillus parasiticus, is correlated to the fungal oxidative stress and cell ageing. In this paper, the mechanism underlying the aflatoxin-inhibiting effect of the Lentinula edodes culture filtrates was studied by analysing their anti-oxidant activity and β-glucan content. Mushroom β-glucans are pharmacologically active compounds stimulating anti-oxidant responses in animal cells. L. edodes lyophilised filtrates stimulate A. parasiticus anti-oxidant enzymes (superoxide dismutase, catalase, glutathione peroxidase) and aflatoxin inhibition was better correlated with β-glucan content than with anti-oxidant activity of the filtrates. RT-PCR analyses on treated mycelia showed a delay in the activation of aflR, and norA, genes of aflatoxin cluster and a synchronous activation of hsf2-like, a homologue of a yeast transcription factor involved in oxidative stress responses. The first evidence of hsf2-like in A. parasiticus and its activation during aflatoxin biosynthesis is reported. L. edodes filtrates could play a role as external stimulus affecting the anti-oxidant status in the fungal cell that, in turn, leads to aflatoxin inhibition. In the fungal cell, β-glucans present in the filtrates could stimulate the activation of transcription factors related to anti-oxidant response and anti-oxidant enzyme activity with a contemporaneous delay of aflatoxin genes transcription, which led to a marked reduction of aflatoxin production. This research suggests new perspectives to set suitable strategies against aflatoxins and L. edodes could be considered a promising tool.