# Study of volatile organic compounds emitted by mycotoxin-producing fungi to develop specific sensors

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## Abstract

Mycotoxins are non-volatile secondary metabolites produced by filamentous fungal species belonging to the genera *Aspergillus*, *Fusarium*, *Penecillium* etc. These fungal molecules are highly toxic at low concentrations to all vertebrates including humans. One of the most abundant mycotoxins is aflatoxin B1, which can cause severe illness with chronic exposure and death with acute exposure.

These ubiquitous fungi contaminate foodstuffs (corn, wheat, rice, etc.) at different stages of their cultivation and storage. Methods to prevent their development exist, but none allow for complete eradication of the fungus. Current detection methods consist of analyzing previously extracted samples using ELISA tests or HPLC.

The purpose of the present work is to identify VOC markers characteristic of the presence of mycotoxins in foodstuff in order to develop specific sensors.

Currently, an in-depth study of the VOCs emitted individually by the plant and the fungus has been realized in order to optimize biological and analytical parameters.

Two fungi categories are compared: non-aflatoxigenic strains (not producing aflatoxins) and aflotoxigenic ones (producing aflatoxins B1, B2 and G2). The next step aims at studying VOCs produced when fungi are growing on stored cereals and the correlation between specific VOCs and mycotoxin content. These VOC markers will be molded in a resin and then destroyed by heating to obtain molecularly imprinted polymers for the design of specific sensors.