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## Detection of fungal growth and its influence on gypsum wallboard – in the process of creating sustainable building materials.

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Indoor fungi are a worldwide problem causing negative health effects for infected building's occupants and even deterioration of building structures. This research focuses on *Stachybotrys* and *Chaetomium* spp. growth on gypsum wallboard. It shows the influence of moisture and fungal mycelium influence on the gypsum wallboard microstructure via investigation of the material using micro-computed tomography (microCT) (Figure 1) and fungal mycelium penetration of the material (Lewińska et al., 2016a). From XRD and solid-state NMR results one can deduce that these fungi need amorphous cellulose and hemicellulose for their growth.

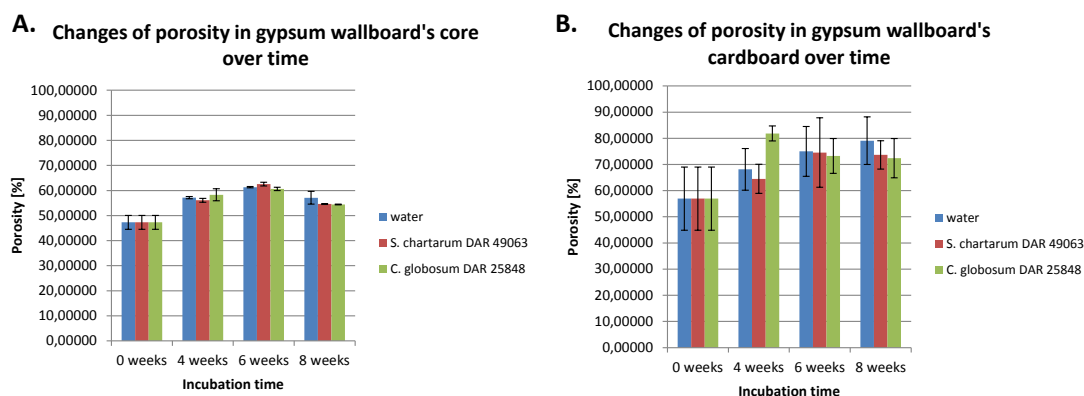


Figure 1. Water and fungal growth influence on porosity of core (A) and cardboard (B) from gypsum wallboard.

Furthermore, since different fungal species affect buildings and their inhabitants differently, rapid and accurate identification of fungi to the species level is essential for health risk assessment and building remediation. One of the fastest and most reliable methods is DNA barcoding. This study proposes two promising candidates for *Stachybotrys* and *Chaetomium* spp. - *hogA* and *h3-h4*, as well as the rapid novel protocol for direct identification of *Stachybotrys* and *Chaetomium* spp is introduced (Lewińska et al., 2016b).

This research not only uncovers new insight about the growth of filamentous fungi in damp building materials but also give the direction for the future research. It also brings us closer to the dream of fungi free and sustainable building materials.

**References:** Lewińska, AM, et al., 2016a. Visualization of the structural changes in plywood and gypsum board during the growth of *Chaetomium globosum* and *Stachybotrys chartarum*. Journal of Microbiological Methods 129:28-38  
Lewińska, AM, et al., 2016b. Rapid Rapid detection and identification of *Stachybotrys* and *Chaetomium* species using tissue PCR analysis. Journal of Microbiological Methods 130: 115-122