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Chitin in the fungal cell wall: Towards valorization of spent biomass of *Aspergillus niger*

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Stellingen

Propositions accompanying this thesis

Chitin in the fungal cell wall: towards valorization of spent biomass of *Aspergillus niger*

1. Chitin to β -glucan crosslinking enzymes (*Crh*) play an auxiliary role in cell wall integrity of α -glucan-containing filamentous fungi (Chapter 2 and Chapter 3, Fang et al., 2019).
2. The discovery that α -glucan, through its interaction with chitin, is present in the core of the cell wall of filamentous fungi fundamentally challenges our understanding of what warrants cell wall integrity (Kang et al., 2018).
3. Yeast studies provide a wonderful frame of reference for many cellular processes similar to those in filamentous fungi. However, it cannot be stressed enough that “similar” and “the same” are not identical.
4. The difference in effectual outcome of knocking out *crh* genes in either unicellular or multicellular fungi is possibly explained by coincidental emergence of chitin-to- β -glucan-crosslinking enzymes with the evolution of hyphae (Kiss et al., 2019).
5. The dependence of the phenotypes of knock-out mutants on marker gene expression makes the application of integrative, auxotrophic selection markers for precise analysis of gene function questionable (Greenstein et al. 2006, Luo et 2016, Chapter 2 and Chapter 4).
6. The hitherto cryptic sexual cycle of *Aspergillus niger* will be an important addition to the genetic toolbox for the identification of causative mutation(s) via segregant analysis in mutants obtained in forward genetic screens. Especially when genetic variation is high or when sought-after traits segregate poorly in the now-used parasexual cycle (Houbraken and Dyer, 2014).
7. Increased deposition of chitin in fungal cell wall appears to be a under complex regulation of hierarchical networks, whereas the chitin biosynthesis pathway itself is rather straightforward. (Chapters 4, 5 and 6).
8. It takes more than just conveying knowledge into laymen’s terms for the public to understand, trust and respect science (Phillip Hunter, 2016).
9. If more people would have a better understanding of the beauty that is biology, the world would be a more peaceful place.
10. The importance of a knowledgeable technician for research projects (as the one described in this thesis) should not be underestimated.
11. While the success of your PhD is mostly determined by luck, resourcefulness, supervision, independence and perseverance (in that order), your colleagues ensure that you survive.