Recombinant bacterial hemoglobin alters metabolism of Aspergillus niger - DTU Orbit (05/03/2019)

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The filamentous fungus Aspergillus niger is used extensively for the production of enzymes and organic acids. A major problem in industrial fermentations with this fungus is to ensure sufficient supply of oxygen required for respiratory metabolism of the fungus. In case of oxygen limitation, the fungus will produce various by-products like organic acids and polyols. In order to circumvent this problem we here study the effects of the expression of a bacterial hemoglobin protein on the metabolism of A. niger. We integrated the vgb gene from Vitreoscilla sp. into the genome at the pyrA locus behind the strong gpdA promoter from Aspergillus nidulans. Analysis of secreted metabolites, oxygen uptake, CO2 evolution and biomass formation points towards a relief of stress in the mutant expressing VHB when it is exposed to oxygen limitation. Our findings therefore point to an interesting strategy to attenuate unwanted side effects resulting from oxygen limitation during industrial fermentations with A. niger.

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