Magnaporthe oryzae as an expression host for the production of the unspecific peroxygenase AaeUPO from the basidiomycete Agrocybe aegerita

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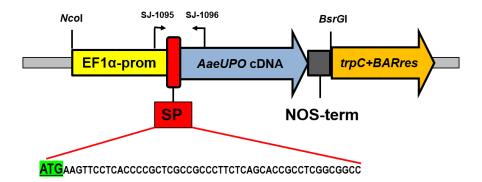
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Abstract

The filamentous fungus Magnaporthe oryzae has the potential to be developed as an alternative platform organism for the heterologous production of industrially important enzymes. M. oryzae is easy to handle, fast-growing and unlike yeast, post-translational modifications like N-glycosylations are similar to the human organism. Here, we established M. oryzae as a host for the expression of the unspecific peroxygenase from the basidiomycete Agrocybe aegerita (AaeUPO). UPOs are attractive biocatalysts for selective oxyfunctionalization of non-activated carbon-hydrogen bonds. To improve and simplify the isolation of AaeUPO in M. oryzae, we fused a Magnaporthe signal peptide for protein secretion and set it under control of the strong EF1-promotor. The success of the heterologous production of full-length AaeUPO in M. oryzae and the secretion of the functional enzyme was confirmed by a peroxygenase-specific enzyme assay. These results offer the possibility to establish the filamentous ascomycete M. oryzae as a broad applicable alternative expression system. This is in particular valid for proteins that cannot or not in sufficient yields produced in established systems.

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