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SELF-IMMOBILIZING LACCASE THROUGH GENETIC FUSION WITH HYDROPHOBIN

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The present study deals with the design of a "self-immobilizing" laccase, a fusion protein built by the laccase fused to an adhesive self-assembling element, the hydrophobin [1].

Hydrophobins are a large family of very active surface proteins produced at different growth stages by filamentous fungi. Class I hydrophobins form extremely robust fibrillar structures sharing structural properties with amyloid fibrils [2]. Hydrophobins efficiently adhere to several hydrophobic surfaces, thus they are of great interest as a versatile and simple platform for the functionalization of different surfaces [3]. The class I hydrophobin Vmh2 from *Pleurotus ostreatus* is able to spontaneously form stable and homogeneous layers on hydrophilic or hydrophobic surfaces, changing their wettability [4].

Herein, a chimeric protein was designed combining the hydrophobin Vmh2 to POXA1b from *P. ostreatus,* a high redox potential laccase endowed with a remarkable stability at high temperature and at alkaline pH [5]. The resulting fusion enzyme is secreted into the culture medium by the heterologous yeast *Pichia pastoris* and directly used for coating of different surfaces without additional purification steps.

Hence, an efficient and straightforward procedure to immobilize the laccase enzyme on different surfaces was set-up. The immobilized enzyme was exploited as biosensor for the detection of phenolic compounds in different fields of applications.

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