

Research projects at the Microbial and Enzyme Technology Lab  
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Research projects at MET:

(1) Biochemical and structural characterization of novel recombinant multicopper oxidases (MCOs) from hyperthermophilic microorganisms.

We propose to use site-directed, saturation and random mutagenesis, followed by robotic screening, in order to dissect the structure, activity and stability of these new enzymes. Catalytic characterization by steady-state and transient-state kinetics will be assessed providing detailed information on the enzymatic reaction mechanisms and rate-limiting steps. Different spectroscopic techniques will be used to characterize the redox centers and elucidate the spectral features of wild type and variant enzymes. This integrated approach is expected to contribute for the elucidation of key aspects of MCOs. Furthermore, we will take the opportunity to get deep insight over the hyperthermostable nature of multicopper oxidases under study as the data obtained could assist the design by protein engineering techniques of optimized and stable bacterial laccases for biotechnological applications.

(2) Research involving the recombinant CotA-laccase from *Bacillus subtilis* on the degradation and synthesis of the most important groups of synthetic industrial colorants, namely the azo and anthraquinonic dyes. ([http://www.itqb.unl.pt/martins/index\\_files/infoproject.pdf](http://www.itqb.unl.pt/martins/index_files/infoproject.pdf))