Laccase-Catalyzed Polymerization of Tyrosine-Containing Peptides

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Laccase-catalyzed polymerization of tyrosine and tyrosine-containing peptides was studied in the presence and absence of ferulic acid (FA). Advanced spectroscopic methods such as MALDI-TOF-MS, EPR, FTIR microscopy and HPLC-fluorescence, as well as more conventional analytical tools: oxygen consumption measurements and SDS-PAGE were used in the reaction mechanism studies. Laccase was found to oxidize tyrosine **(Y)** and tyrosine-containing peptides, with consequent polymerization of the compounds. The covalent linkage connecting the compounds was found to be an ether bond. Only small amounts of dityrosine bonds were detected in the polymers. When FA was added to the reaction mixtures, it was found to be incorporated into the polymer structure. Thus, in addition to homopolymers different heteropolymers containing two or four FA residues were formed in the reactions.