Creative Enzymes®

lignin peroxidase

Cat. No. EXWM-0495

Lot. No. (See product label)

Introduction

Description	A hemoprotein, involved in the oxidative breakdown of lignin by white-rot basidiomycete fungi. The reaction involves an initial oxidation of the heme iron by hydrogen peroxide, forming compound I (FeIV=O radical cation) at the active site. A single one-electron reduction of compound I by an electron derived from a substrate molecule yields compound II (FeIV=O non-radical cation), followed by a second one-electron transfer that returns the enzyme to the ferric oxidation state. The electron transfer events convert the substrate molecule into a transient cation radical intermediate that fragments spontaneously. The enzyme can act on a wide range of aromatic compounds, including methoxybenzenes and nonphenolic β-O-4 linked arylglycerol β-aryl ethers, but cannot act directly on the lignin molecule, which is too large to fit into the active site. However larger lignin molecules can be degraded in the presence of veratryl alcohol. It has been suggested that the free radical that is formed when the enzyme acts on veratryl alcohol can diffuse into the lignified cell wall, where it oxidizes lignin and other organic substrates. In the presence of high concentration of hydrogen peroxide and lack of substrate, the enzyme forms a catalytically inactive form (compound III). This form can be rescued by interaction with two molecules of the free radical products. In the case of veratryl alcohol, such an interaction yields two molecules of veratryl aldehyde.
Synonyms	diarylpropane oxygenase; ligninase I; diarylpropane peroxidase; LiP; diarylpropane:oxygen,hydrogen-peroxide oxidoreductase (C-C-bond-cleaving); 1,2-bis(3,4-dimethoxyphenyl)propane-1,3-diol:hydrogen-peroxide oxidoreductase (incorrect); (3,4-dimethoxyphenyl)methanol:hydrogen-peroxide oxidoreductase

Product Information

Form	Liquid or lyophilized powder
EC Number	EC 1.11.1.14
CAS No.	93792-13-3
Reaction	(1) 1-(3,4-dimethoxyphenyl)-2-(2-methoxyphenoxy)propane-1,3-diol + H2O2 = 3,4-dimethoxybenzaldehyde + 2-methoxyphenol + glycolaldehyde + H2O; (2) 2 (3,4-dimethoxyphenyl)methanol + H2O2 = 2 (3,4-dimethoxyphenyl)methanol radical + 2 H2O
Notes	This item requires custom production and lead time is between 5-9 weeks. We can custom produce according to your specifications.

Storage and Shipping Information

Storage	Store it at +4 ℃ for short term. For long term storage, store it at -20 ℃~-80 ℃.