

Laccase

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Laccases are copper-containing oxidase enzymes that are found in many plants, fungi and microorganisms. The copper can be bound in several sites; Type 1, Type 2, and/or Type 3. When types 2 and 3 are bound together, the enzyme is called a trinuclear cluster. Laccases are enzymatically active on phenols and similar molecules, and perform a one-electron oxidation. Laccases can be polymeric, and the enzymatically active form can be a dimer or trimer. The easiest way to detect activity in Laccases is with a spectrophotometer. Substrates that are commonly used with this method are ABTS, syringaldazine, 2,6-dimethoxyphenol, and dimethyl-p-phenylenediamine. Also, activity can be monitored with an oxygen sensor as the oxidation of the substrate is paired with the reduction of oxygen to water. Laccases can also be used as the cathode in an enzyme catalyzed fuel cell. They can be paired with an electron mediator to facilitate electron transfer to a solid electrode wire. Laccase is one of the few oxidoreductases commercialized as industrial catalysts. The enzyme can be used for textile dyeing/finishing, wine cork making, and many other industrial, environmental, diagnostic, and synthetic uses Applications of oxidoreductases: Recent progress, Industrial Biotechnology 1, 38-50[<http://www.liebertonline.com/doi/pdf/10.1089/ind.2005.1.38?cookieSet=1>]).

Recent Publications on Laccase:



- [ABTS-Modified Multiwalled Carbon Nanotubes as an Effective Mediating System for Bioelectrocatalytic Reduction of Oxygen.](#)
*The ability of such a common redox mediator as...*30th August, 2008
- Anal Chem. 2008 Aug 27. ([DOI Direct Link](#))
- [Effect of growth substrate, method of fermentation, and nitrogen source on lignocellulose-degrading enzymes production by white-rot basidiomycetes.](#)
*The exploration of seven physiologically different white rot fungi...*22nd August, 2008
Durmishidze Institute of Biochemistry and Biotechnology, 10 km- J Ind Microbiol Biotechnol. 2008 Aug 21. ([DOI Direct Link](#))
- [Evaluation of the white-rot fungi *Ganoderma australe* and *Ceriporiopsis subvermispora* in biotechnological applications.](#)
*Ganoderma australe is a white-rot fungus that causes a selective wood...*21st August, 2008
Biotechnology Center, Universidad de Concepcion, Casilla 160-C,- J Ind Microbiol Biotechnol. 2008 Aug 20. ([DOI Direct Link](#))
- [\[Micellar laccase-catalyzed synthesis of electroconductive polyaniline\]](#)
*A method of enzymatic synthesis of electroconductive polyaniline on the...*20th August, 2008
- Prikl Biokhim Mikrobiol. 2008 May-Jun;44(3):296-303.
- [Bubble-free oxygenation of a bi-enzymatic system: effect on biocatalyst stability.](#)
*The effect of bubble-free oxygenation on the stability of a bi-enzymatic...*14th August, 2008
Research Group Environmental Organic Chemistry and Technology (ENVOC),- Biotechnol Bioeng.

2008 Jul 18. ([DOI Direct Link](#))

- [Laccase-catalyzed carbon-nitrogen bond formation: coupling and derivatization of unprotected L-phenylalanine with different para-hydroquinones.](#)
Unprotected L-phenylalanine was derivatized by an innovative enzymatic... 13th August, 2008
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- [Laccases of *Pleurotus ostreatus* observed at different phases of its growth in submerged fermentation: production of a novel laccase isoform.](#)
The production of laccases during the lag, exponential and stationary... 12th August, 2008
Laboratory of Biotechnology, Research Centre for Biological Sciences,- Mycol Res. 2008 Mar 26. ([DOI Direct Link](#))
- [Transistor-Like Behavior of a Fungal Laccase.](#)
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Biomedical Science Laboratory, Faculty of Health and Society, Malmö- Angew Chem Int Ed Engl. 2008 Aug 8. ([DOI Direct Link](#))
- [Purification of recombinant laccase from *Trametes versicolor* in *Pichia methanolica* and its use for the decolorization of anthraquinone dye.](#)
*A recombinant laccase from *Trametes versicolor* in *Pichia methanolica* was...* 9th August, 2008
Department of Food Science, Tianjin Agriculture College, Tianjin, 300384,- Biotechnol Lett. 2008 Aug 8. ([DOI Direct Link](#))
- [Defoliation effects on enzyme activities of the ectomycorrhizal fungus *Suillus granulatus* in a *Pinus contorta* \(lodgepole pine\) stand in Yellowstone National Park.](#)
Ectomycorrhizal (EM) basidiomycete fungi are obligate mutualists of pines... 6th August, 2008
NASA-Ames Research Center, MS 239-11, Moffett Field, CA, 94035-1000, USA,- Oecologia. 2008 Aug 5. ([DOI Direct Link](#))
- [In situ cationic ring-opening polymerization and quaternization reactions to confine ferricyanide onto carbon nanotubes: a general approach to development of integrative nanostructured electrochemical biosensors.](#)
This study demonstrates a new and relatively general route to the... 2nd August, 2008
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- [Laccase-induced C-N coupling of substituted p-hydroquinones with p-aminobenzoic acid in comparison with known chemical routes.](#)
Fungal laccases (benzenediol:oxygen oxidoreductase, EC 1.10.3.2) from... 1st August, 2008
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- [Molecular characterization of the basidiomycete isolate *Nematoloma frowardii* b19 and its manganese peroxidase places the fungus in the corticioid genus *Phlebia*.](#)
The basidiomycete isolate b19, originally identified by morphological... 1st August, 2008
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- [Laccase and Lectin Activities of Intracellular Proteins Produced in a Submerged Culture of the Xylotrophic Basidiomycete *Lentinus edodes*.](#)
*The white-rot fungus *Lentinus edodes* produced D: -melibiose-specific...* 30th July, 2008
Institute of Biochemistry and Physiology of Plants and Microorganisms,- Curr Microbiol. 2008 Oct;57(4):381-5. Epub 2008 Jul 29. ([DOI Direct Link](#))
- [Determination of reactive oxygen species generated in laccase catalyzed oxidation of wood fibers from Chinese fir \(*Cunninghamia lanceolata*\) by electron spin resonance spectrometry.](#)
The aim of the present study was to determine whether the radical reaction... 25th July, 2008
Institute of Biophysics, Chinese Academy of Sciences, Beijing 100101, PR- Bioresour Technol. 2008 Jul 21. ([DOI Direct Link](#))



Laccase Patents:

- 7311926- [Biocomposite materials and methods for making the same](#)
- 7344751- [Assembled hematin, method for forming same and method for polymerizing aromatic monomers using same](#)
- 7348168- [Polypeptides having cellobiohydrolase II activity and polynucleotides encoding same](#)
- 7351683- [Laundry additive sachet](#)
- 7351798- [Stabilized protein crystals, formulations comprising them and methods of making them](#)
- 7354743- [Methods for degrading lignocellulosic materials](#)
- 7358084- [Enhanced secretion of a polypeptide by a microorganism](#)
- 7358327- [Assembled hematin, method for forming same and method for polymerizing aromatic monomers using same](#)
- 7361487- [Enzyme fusion proteins and their use](#)
- 7361495- [Polypeptide from a cellulolytic fungus having cellulolytic enhancing activity](#)
- 7361636- [Cyclosporin alkynes and their utility as pharmaceutical agents](#)
- 7335310- [Method of treating wastewater containing hardly decomposable harmful substances](#)
- 7332341- [Methods for producing heterologous polypeptides in trichothecene-deficient filamentous fungal mutant cells](#)
- 7332310- [Mutant of homoserine dehydrogenase from Corynebacterium and DNA encoding thereof](#)
- 7312062- [Lipolytic enzyme variants](#)
- 7317136- [Methods for modifying plant cell walls and modified plants produced thereby](#)
- 7319087- [Antimicrobial polypeptide from Aspergillus niger](#)
- 7319112- [Non-halogenated antibacterial agents and processes for making same](#)
- 7323511- [Post-coupling synthetic approach for polymeric antioxidants](#)
- 7326548- [Polypeptides having glucoamylase activity and polynucleotides encoding same](#)
- 7329424- [Process for manufacturing cheeses and other dairy products and products thereof](#)
- 7329441- [Water-soluble pouches](#)
- 7329528- [Enzyme multimer and process of producing same](#)
- 7332297- [Enzymatic polymerization](#)
- 7361736- [Family 44 xyloglucanases](#)
- 7364892- [Microbial trypsin mutants having chymotrypsin activity and nucleic acids encoding same](#)
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- 7396974- [Oxidation using a non-enzymatic free radical system mediated by redox cycling chelators](#)
- 7399320- [Use of tetra-azapentamethine compounds as direct dyeing agents and novel tetra-azapentamethine compounds](#)
- 7399400- [Nanobiosensor and carbon nanotube thin film transistors](#)
- 7402428- [Modification of plant lignin content](#)
- 7402664- [Nucleic acids and expression vectors comprising carotenoid binding peptides](#)
- 7405271- [Alkaline protease](#)
- 7408052- [Nucleic acid molecules and other molecules associated with the carbon assimilation pathway](#)
- 7410709- [Bio-battery](#)
- 7413882- [Methods for degrading or converting plant cell wall polysaccharides](#)
- 7393664- [Methods for producing secreted polypeptides](#)
- 7390512- [Multiple sclerosis synergistic phyto-nutraceutical composition](#)
- 7388077- [Polypeptides having antimicrobial activity and polynucleotides encoding the same](#)
- 7368190- [Miniature biological fuel cell that is operational under physiological conditions, and associated](#)

[devices and methods](#)

- 7368262- [Promoter variants for expressing genes in a fungal cell](#)
- 7368271- [Polypeptides having alpha-glucosidase activity and polynucleotides encoding same](#)
- 7371927- [Methods for modulating plant growth and biomass](#)
- 7375404- [Fabrication and integration of polymeric bioMEMS](#)
- 7378256- [Aspergillus niger promoter for expressing genes in host cells](#)
- 7378264- [.alpha.-amylase mutants](#)
- 7378391- [Cyclosporin alkyne analogues and their pharmaceutical uses](#)
- 7381812- [Enhanced secretion of a polypeptide by a microorganism](#)
- 7384701- [Biocatalytic direct alcohol fuel cell](#)
- 7413888- [Variants of beta-glucosidases](#)

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