

# Characterization of the mushroom Tyrosinase for L-DOPA production

Bachelor thesis at the  
Institute of Technical Biocatalysis



## Introduction

Tyrosinase is involved in the biosynthesis of melanins and catalyzes the hydroxylation of monophenols such as L-Tyrosin to L-3,4-Dihydroxyphenylalanin (L-Dopa) and the oxidation of L-Dopa to Dopakinone. Quinones undergo several reactions to form different melanins.

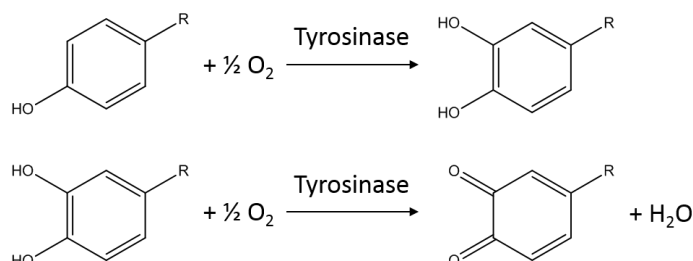


Figure 1: Enzymatic hydroxylation of a monophenol (upper part) to the corresponding o-diphenol and its further oxidation to the corresponding o-quinone (lower part).

In medicine, L-DOPA is being used as a drug for Parkinson's disease. The biochemical production of L-Dopa has the potential to be advantageous compared to its chemical synthesis with respect to higher conversions, enantioselectivity and mild reaction conditions.

Defined reaction conditions are crucial for the production of the preferred o-diphenols as further modifications lead to unwanted side-products. Therefore, characterization of the enzyme and the testing of different reaction conditions such as pH and temperature are required to achieve high yields of L-DOPA.

## Content of the Thesis

During this bachelor thesis

- Kinetic parameters of enzymatic conversions will be determined
- Effect of temperature and pH on the enzymatic conversion will be evaluated
- Different additives can be compared for reaction optimization

For the analysis of the experiments, HPLC as well as optical oxygen sensors will be used.

## Requirements

General knowledge of biochemical catalysis and thermodynamics,  
commitment, team player, capable to work independently

**Beginning: August 2018**

## Contact

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