Replacement of sulphur dioxide (SO_2) in food keeping the SAme qualitY and shelf-life of the products

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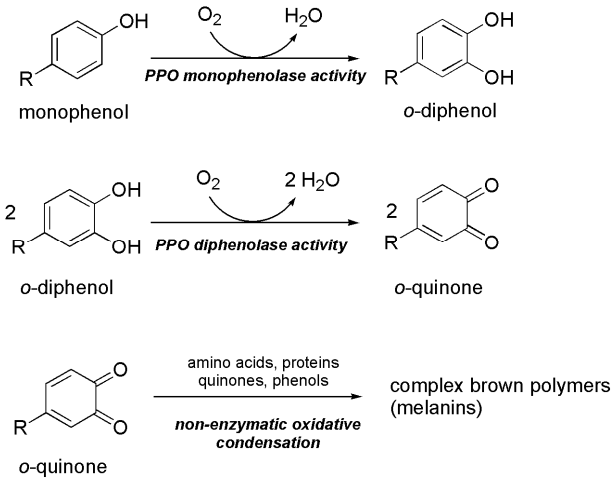
http://www.so2say.eu/

Several fruit and vegetable crops are prone to changes in color (browning), flavor and texture. It is a limiting factor in their handling and processing. Peeled, sliced or bruised tissues rapidly undergo browning. Polyphenol oxidases (PPO), also known as tyrosinases, are the enzymes responsible for the undesired browning of food products.

Enzymatic browning occurs in two steps: enzymatic *o*-hydroxylation of monophenols and oxidation to yield *o*-quinones. This is followed by the non-enzymatic polymerization to melanin pigments.

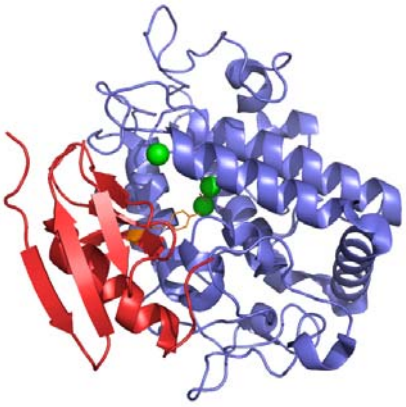


Enzymatic browning is usually controlled by heat treatment, low oxygen atmosphere or chemical agents like sulfur dioxide. The latter is one of the most potent inhibitors of browning, either acting as reducing agent or directly inhibiting PPO. Sulfiting agents are utilized frequently in the fruit and vegetable industry because of their effectiveness and low price. However, it is well known that these sulfites are liable for various health damages, can act as strong allergens and are connected to asthma (attacks) which creates the need for functional alternatives. The aim of this project is to identify secondary plant metabolites that are able to inhibit PPO present in vegetables and fruits.

Within the SO_2SAY project, the approach at the biochemistry department will be the structural analysis of PPO from selected sources followed by inhibition studies.

Available projects

Biochemistry: Large scale purification of potato polyphenol oxidase using techniques such as extraction, concentration, fast protein liquid chromatography (FPLC), and detailed biochemical analysis of the purified protein including folding and inhibitor studies using spectroscopic analysis.



Bioinformatics: Design of enzyme inhibitors using available PPO structures and known inhibitors as model compounds.

PPO from *Streptomyces castaneoglobisporus*
Matoba et al. (2006) JBC 281:8981-8990