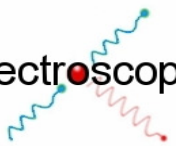


# Raman Spectroscopy of Metalloproteins



## **Purification of heterologously expressed peroxidase and spectroscopic characterization to probe the mechanistic basis for function**

Peroxidases constitute a superfamily of haem-containing enzymes that catalyze the reduction of hydrogen peroxide to water while oxidizing an organic substrate. These enzymes are broadly distributed among living organisms and are involved in a wide range of physiological functions including cell wall formation, lignification, defense, stress related processes, protection of tissues from pathogens, etc. Moreover, peroxidases are extremely interesting proteins due to their actual and potential technological applications.

In this project, a multidisciplinary approach will be undertaken, in order to:

### **- purify an extensin peroxidase**

The isolation and purification of the recombinant GvEP produced in *E. coli*, will be performed in collaboration with the Plant Cell Wall Laboratory, ITQB.

### **- look at the active site structure and reaction dynamics of a peroxidase**

Resonance Raman and stationary and time-resolved surface enhanced resonance Raman spectroscopies, that can reveal highly specific and sensitive information on discrete metal site(s) within a protein, will be employed.

### **- address the molecular basis of functioning of an immobilized peroxidase**

as prerequisite for understanding of their functioning in bioelectronic devices, such as biosensors for determination of H<sub>2</sub>O<sub>2</sub> in rainwater, in disinfectant preparations and in the textile, paper and food industries.

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