

BAG Beam time Progress Report

This represents a summary of the BAG progress in the reporting period, and is in addition to the standard ESRF report sheet for each project which will be used for the Review of the BAG.

BAG Title

Allocation Period

List of publications resulting from ESRF beam time

- *. M.J.Mate, M.Zamocky, P.M.Alzari, L.M.Nykyri, C.Betzel, F.Koller, **I.Fita**
"Refined crystal structure of catalase-A from *Saccharomyces cerevisiae*".
J.Mol.Biol. **286**, (1999), 135-149.
- *. M.J.Maté, M.Serdal-Sevinc, B.Hu, J.Bujons, J.Bravo, J.Switalla, W.Ens, P.C.Loewen
I.Fita
"Mutants that alter the covalent structure of Catalase-Hydroperoxidase II from
Escherichia coli"
J.Biol.Chem. **274**, (1999), 27717-27725.
- *. P.Nicholls, **I.Fita** and P.C.Loewen
"Enzymology and Structure of Catalases"
Advances in Inorganic Chemistry. Ed.G.Mauk. (In press).
- *. M.J.Maté, G.Murshudov, J.Bravo, W.Melik-Adamyan, P.C.Loewen and **I.Fita**
"Heme-Catalases"
Handbook of Metalloproteins, John Wiley & Sons, Ltd. (In press).

Global Summary

Catalases are heme-containing tetramers, with molecular weights ranging from about 200 till 350 kDa, that degrade hydrogen peroxide. Despite the large number of studies done on catalases belonging to the Clade I and II groups virtually no structural information exists from a most distinctive group of catalases (Clade III) that includes all plants and some bacterial enzymes. To overcome this situation data was collected at the ESRF from catalase crystals of *Pseudomonas*, of *Listeria* (space group I222 (or I212121) and unit cell parameters $a=75 \text{ \AA}$, $b=122 \text{ \AA}$ and $c=370 \text{ \AA}$). Crystals are also available from the hemeless plant catalase from pea (space group $P4_12_12$, or its enantiomorph $P4_32_12$, with unit cell parameters $a=111 \text{ \AA}$, $c=204 \text{ \AA}$). The three catalases analysed belong to the Clade III group. Structure determination is now in progress including a search for heavy atom derivatives for the apparently very different structure adopted by the hemeless protein.

Visits made to the ESRF

Date(s) of visits	Beamline	No. of Shifts	Short Summary of each Visit
1. 20-Nov-99/22-Nov-99 13-Feb-00/15-Feb-00	ID14-2 ID14-2		Data collection of native crystals of Listeria catalase at 2.5 A resolution Data collection of native crystals of Pseudomonascatalase at 2.2 A resolution