

**P027** Modelling the Mechanism of Chitinase B  
**Heather Rowlands and Adrian Mulholland**  
*University of Bristol*

Chitinase is an important enzyme from the glycosyl hydrolase family of enzymes. Found in a diverse and numerous collection of organisms, it catalyses the break down of chitin, releasing dimers and trimers in a progressive manner. Due to its presence in such a wide range of organisms from yeast and bacteria to insects and crustaceans, it is a good target for inhibitors in the form of fungicides, insecticides and anti-malarials. An enzyme with chitinase activity has recently been found in humans and has been suggested to play a role in defence against chitin containing pathogens.

Better understanding of the mechanism of this enzyme could help in the design of novel inhibitors. A mechanism for chitinase B has been proposed from structural and mutational studies is, in some ways, similar to that of lysozyme and other amylases. The nucleophilic attack in particular differs from other glycosyl hydrolases in that the N-acetyl group of the sugar ring itself is the nucleophile, compared with lysozyme where the nucleophile is an aspartate side chain. Quantum Mechanics/Molecular Mechanics (QM/MM) techniques have been employed in this study to investigate the reaction profile of each step in the mechanism.