

P020 Biocatalytic Approach to Aminodiol Synthesis using ω -Transaminases

U. Kaulmann¹, M.E.B. Smith², J.M. Ward¹

*University College London, Dep. of ¹Biochemistry
& Mol. Biology, ²Chemistry, London, UK*

The Biocatalysis-Chemistry-Engineering Interface programme (BiCE), founded at UCL, evaluates the applicability of multistep biocatalytic/chemocatalytic routes to complex chemical intermediates of industrial relevance. The concepts and tools are currently being applied to a two-step system, which is directed to the synthesis of chiral aminodiols via intermediate ketodiols. The work described here focuses on the second step, the stereospecific transamination of ketodiols.

In this context we have recruited new transaminases for enantioselective amination of transketolase products yielding chiral amines (with a focus on aryl amines). Whereas most transaminases accept only substrates with at least one carboxyl group, the ω -transaminase (ω TA) of *Vibrio fluvialis* - which is most closely related to the subgroup of β -alanine:pyruvate transaminases - has been described as the first transaminase which prefers aryl amines as amine donors rather than amino acids (Shin & Kim, 2001). We have cloned and expressed 17 bacterial ω TAs which show 31-39% sequence identity to the *V. fluvialis* enzyme. The ω TAs were grouped by homology using ClustalW and by preliminary substrate analysis. The majority of these ω TAs prefer (S)- α -methylbenzylamine over β -alanine. Initial bioconversion experiments with cell extracts show that L-erythrulose and two other ketodiols are converted by ω -transaminases from *C. violaceum*, *Thermobifida fusca* and *Pseudomonas putida* up to 30% in 24h.