1. INTRODUCTION

Chiral amines represent the core structure of a myriad of natural products as well as manmade compounds of public demand, such as pharmaceuticals and agrochemicals. The asymptotic reduction of imines using NAD(P)H dependent imine reductases (IREDS) represents a particularly attractive option for chiral amine synthesis. In the past few years dozens of novel IREDS have been identified and investigated in terms of their substrate scope, temperature stability and pH optima. They have been applied in synthesis as well as for the amination of ketones. Based on the published results, sequence alignments of the sequences of IREDS with available crystal structures were performed to help us identify new members of the growing family of IREDS which have then been further characterized and found to be active enzymes (enzymes shown in grey in the figure on the right).

2. SUBSTRATE SCOPE

Most of the IREDS accepted a wide range of substrates, such as 5- and 6-membered rings as well as condensed systems of the isoquinoline, indole or carboline type. Reactions went to completion within 2 h at 10 mM substrate conc. for the majority of the substrates, whereas the enantiomeric access was good to excellent for almost all the enzymes investigated.

Many of the herein investigated IREDS were stable below 37°C with an optimum pH of ca. 7.5. Furthermore, some enzymes showed increased activities with different buffer salts with the biggest increase being around pH 7.5 and 8.

3. PH & TEMPERATURE PROFILE

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