Studies on the biosynthesis of desferrioxamine in *Streptomyces pilosus*

A. Smith
Department of Biotechnology, Pharmaceutical Division, Ciba-Geigy Ltd, CH-4002 Basel

The desferrioxamines comprise a group of structurally related siderophores secreted by streptomycetes in response to a deficiency of iron in the environment. The main component of the mixture of iron chelating compounds produced by *S. pilosus* is desferrioxamine B which is the active substance in the therapeutic drug Desferal®. Evidence is presented from studies with resting cell suspensions and using radiolabeled precursors that the amino acid lysine is a precursor in the biosynthesis. Strain improvement by selection of specific mutant types is discussed. Evidence is also presented to show that structurally related desferrioxamines which complicate the purification procedure for desferrioxamine B have an alternative precursor molecule. The use of specific mutants selected to circumvent this problem is described.

Biodegradation and utilization of N,N-dimethylformamide by specialized methylotrophs

O. Ghisalba, M. Küenzi and H.-P. Schär
Central Research Laboratories and Biotechnology Department of Ciba-Geigy Ltd, CH-4002 Basel

In order to establish a biological waste treatment process for N,N-dimethylformamide (DMF) containing mother liquors from chemical productions we searched for DMF degrading microorganisms. More than 30 methanol and methylamine degrading methylotrophs from strain collections were tested and found to be unable to utilize DMF. DMF utilization is thus not a common property of methylotrophs. We enriched and isolated specialized facultative methylotrophs utilizing DMF as the sole source of carbon, nitrogen and energy from sewage sludge (group 1: strains DMF 3/3, 3/4, 3/5, 3/6, 3/11 and 3/12), from Hallwilersee lake sediment (group 1a: strain DMF/HW1–5) and from a mud pond in Kairouan (group 2: strains DMF 4/4, 5/3, 5/5, 5/7, 5/8, 5/9 and 5/10). These 14 pure isolates were taxonomically characterized and identified as *Pseudomonas* sp. The strains are able to utilize the following substrates (selection): DMF, N-methylformamide, N-ethylformamide, formamide, acetamide, methylamine, dimethylamine, trimethylamine, ethylamine, ethanol, methanol (only strains of groups 1 and 1a), acetate and glucose. The strains of groups 1 and 1a contain the novel enzyme N,N-dimethylformamidase cleaving DMF into dimethylamine and formate, whereas the strains of group 2 do not contain this enzyme and must follow a different route for the degradation of DMF (probably two-step N-demethylations and cleavage of formamide). DMF is in all cases totally biodegraded and no accumulation of organic intermediates, only the formation of NH_4^+ is observed.