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BIOTECHNOLOGY

Edited by C. F. PHELPS and P. H. CLARKE

The fourteen contributions forming this volume were presented at a London meeting of the Biochemical Society including the Society's Forty-Eighth Symposium 'Biotechnology', in December 1982. With today's increasing pressures to develop latest laboratory findings into practical industrial processes as quickly as possible the chosen theme of this Symposium was a timely one. The papers represent up-to-date reports from international biochemists whose work is of direct relevance to the wide areas of interests concerned with biotechnology, together with glimpses of the early development of its techniques and a look at its exciting future.

List of contents and authors:

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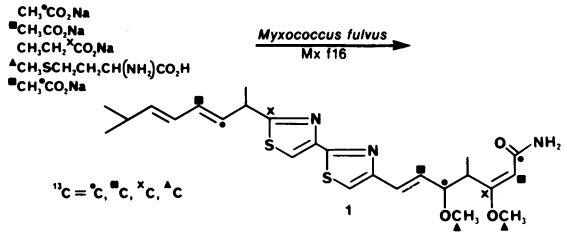
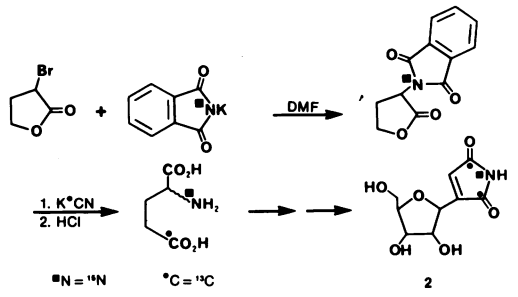
Stable Isotopes

Organics containing stable isotopes have had a long history at Aldrich starting with deuterated solvents over a decade ago. More recently, carbon-13-enriched compounds have been offered in expanding diversity, followed by carbon-13-depleted products and nitrogen-15-labeled organic and inorganic compounds. Below are the results of some recent studies employing isotopes to solve interesting biosynthetic, structural and mechanistic problems.

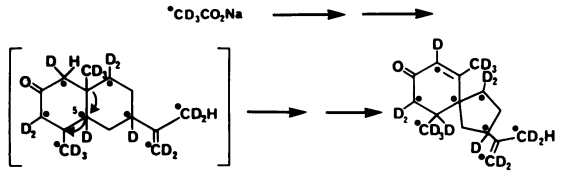
Studies on the biosynthesis of the nonaromatic moiety of Myxothiazol (**1**) in *Myxococcus fulvus* Mx f16 using labeled sodium carboxylates and methionine indicated that the precursors were incorporated into the backbone of the molecule.[1]



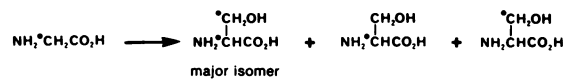
Studies with labeled L-glutamic acid have shown that it is a direct biosynthetic precursor of showdomycin (**2**).[2]



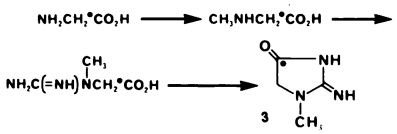
Sodium acetate-2-^{13}C-2-d_3 has been used to study the proposed migration of hydrogen from C-5 to C-4 in the biosynthesis of potato phytoalexin shown below.[3]



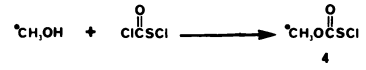
The metabolism of **glycine-2-^{13}C** to labeled serine by a suspension of cultured tobacco cells has been followed *in vivo* using ^{13}C-NMR.[4] The kinetics of the intragastric utilization of **D-glucose-1-^{13}C** in mice have also been followed *in vivo* by NMR.[5]



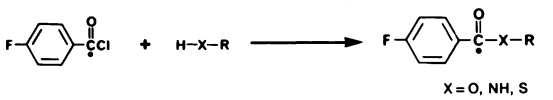
Glycine-1-^{13}C has been used as a precursor in the synthesis of creatinine (**3**), an important end-product of nitrogen metabolism in vertebrates.[6]



Methyl-^{13}C alcohol was used to synthesize ^{13}C-labeled methoxycarbonylsulfenyl chloride (**4**), which was subsequently used to test for the presence of a disulfide linkage in digestion fragments of reduced hen egg-white lysozyme.[7]



4-Fluorobenzoyl-*carbonyl*-^{13}C chloride is a versatile tagging reagent which gives rise to distinctive ^{19}F- and ^{13}C-NMR signals that can be correlated to specific functional groups.[8]



The mechanism of the elimination reactions of $Os(CO)_4R_2$ has been studied using stable isotopes.[9]

References:
(1) Trowitzch-Kienast, W. *et al. Justus Liebigs Ann. Chem.* **1986**, 93. (2) Buchanan, J.G. *et al. Chem. Commun.* **1984**, 1515. (3) Stoessel, A.; Stothers, J.B. *Can. J. Chem.* **1983**, *61*, 1766. (4) Ashworth, D.J.; Mettler, I.J. *Biochemistry* **1984**, *23*, 2252. (5) Field, J. *et al. Biochem. Biophys. Res. Commun.* **1984**, *123*, 862. (6) Rowley, G.L.; Kenyon, G.L. *J. Heterocycl. Chem.* **1972**, *9*, 203. (7) Galphin, I.J.; Hoyland, D.A. *Tetrahedron* **1985**, *41*, 901. (8) Spratt, M.P. *et al. Anal. Chem.* **1985**, *57*, 359. (9) Carter, W.J.; Okrasinki, S.J.; Norton, R.J. *Organometallics* **1985**, *4*, 1376.

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