Catabolism of 1-Phenylalkanes by *Nocardia salmonicolor* (N.C.I.B. 9701)

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Previous studies demonstrated that *Nocardia* isolates from soil utilize 1-phenylalkanes as sole carbon and energy sources for growth (Webley *et al.*, 1955, 1956; Davis & Raymond, 1961). Baggi *et al.* (1972) have since described the metabolism of 2-, 3- and 4-phenylalkanes by *Pseudomonas* and *Nocardia* isolates.

The present communication reports that *Nocardia salmonicolor* (N.C.I.B. 9701) grows on various *n*-alkanes, 1-phenylalkanes and simple aromatic compounds as sole carbon and energy sources. The organism grows readily in stirred fermenters at 30°C with 1-phenylnonane or 1-phenyldodecane as substrate. When medium containing 0.5% (v/v) of 1-phenyldodecane was inoculated with washed nutrient-broth-grown organisms there was a 6h lag phase during which rapid induction of isocitrate lyase (EC 4.1.3.1) occurred. Exponential growth followed (mean generation time 6h) and isocitrate lyase activity reached a maximum value of $100\text{nmol}\cdot\text{min}^{-1}\cdot(\text{mg of protein})^{-1}$. There was a marked diauxic (lag 20h) and isocitrate lyase activity was decreased towards the end of the first growth phase, being further lowered during the ensuing lag and second growth phase.

During the first growth phase 4-phenylbutyrate, 4-phenylbut-3-enoate and cinnamate accumulated in the medium, 4-phenylbutyrate being the first to appear. Approx. 14% of the growth substrate accumulated as these acids, which disappeared from the medium at the onset of diauxic lag, when there was a concomitant accumulation of four mono-hydroxylated phenolic acids, one being identified as 4-(*o*-hydroxyphenyl)butyrate and another as a 4-hydroxyphenylbut-3-enoate. These hydroxylated compounds were utilized during the second, shorter, growth phase. Additionally, phenylacetate was isolated from culture media after growth under O_2 -limited conditions.

1-Phenyldodecane-grown organisms rapidly oxidized 4-phenylbutyrate, cinnamate, phenylacetate and homogentisate, but not benzoate or protocatechuate, and cell-free extracts contained homogentisate oxygenase activity (Chapman & Dagley, 1962). These results suggest that 1-phenyldodecane is metabolized as follows:

Evidence will be presented that accumulation of hydroxylated compounds reflects metabolic imbalance resulting from exhaustion of the growth substrate and consequent diminution in the supply of acetate units from the side chain.

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Inhibition Studies on the Aromatization of Androst-4-ene-3,17-dione by Human Placental Microsomal Preparations

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The nature of the mixed-function oxidases present in placenta has recently aroused much attention. Cytochrome *P*-450 has been reported to be present in low concentrations in the mitochondrial and microsomal fractions of placenta of different species, and activities of drug-metabolizing enzymes are correspondingly low (Meigs & Ryan, 1968; Chakraborty *et al.*, 1971). However, the placenta is capable of synthesizing many steroids, especially oestrogens, and aromatization of androgens to oestrogens occurs in most species except rabbits and guinea pigs (Hagerman, 1969).

Using a radiochemical method for the determination of the rate of conversion of [$7\alpha\text{-}^3\text{H}$]androst-4-ene-3,17-dione into [$7\alpha\text{-}^3\text{H}$]oestrone, we have studied the nature of the steroid-ring-A-aromatizing enzyme present in a stored microsomal fraction of full-term human placenta. The enzyme system requires NADPH and O_2 (Akhtar & Skinner, 1968), is not affected by CO and no marked loss of activity occurs