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The Intestinal Absorption of 3-*sn*-Phosphatidylethanolamine in the Rat

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1,2-Di[1-¹⁴C]palmitoyl-*sn*-glycero-3-[³²P]phosphoryl[2-³H]ethanolamine (Owen *et al.*, 1971) was fed in olive oil by gastric intubation to albino rats with thoracic-duct fistulae.

Analysis of the intestinal contents 1 or 2 h after feeding showed that at least 15% of the fed compound had been degraded to monoacyl-*sn*-glycero-3-phosphorylethanolamine and palmitate. Up to 90% of the ³²P and ³H radioactivities in the clear aqueous supernatant, after centrifugation of the intestinal contents, was recovered as monoacyl-*sn*-glycero-3-phosphorylethanolamine.

Up to 4.5% of the administered ¹⁴C, 6% of the administered ³²P and 6% of the administered ³H were recovered in the lymph phospholipids. Of the administered ¹⁴C 52% was recovered in the lymph diacylglycerols and triacylglycerols. ³²P and ¹⁴C were recovered in the lymph ethanolamine phosphoglyceride (3-*sn*-phosphatidylethanolamine and monoacyl-*sn*-glycero-3-phosphorylethanolamine), choline phosphoglyceride, phosphoinositide and sphingomyelin fractions. ³H was recovered in the lymph ethanolamine phosphoglyceride fractions only.

The ¹⁴C, ³²P and ³H relative specific radioactivities of the lymph 3-*sn*-phosphatidylethanolamine fraction rose to maxima of 25, 50 and 50 respectively when the specific radioactivities of the administered trilabelled 3-*sn*-phosphatidylethanolamine were 100 d.p.m./μg of lipid P.

The isotopic proportions ¹⁴C:³²P:³H of the lymph 3-*sn*-phosphatidylethanolamine fraction remained constant at 1.0:1.0:1.0 throughout lymph collection when the administered trilabelled compound had isotopic proportions 2.0:1.0:1.0. The ¹⁴C:³²P ratio of the major lymph phospholipid fraction, 3-*sn*-phosphatidylcholine, rose to a maximum of 7.0:1.0.

These results suggest that the administered 3-*sn*-phosphatidylethanolamine was absorbed from the intestinal lumen as monoacyl-*sn*-glycero-3-phosphorylethanolamine and in part subsequently reacylated (Stein & Stein, 1966) within the mucosa. A small fraction of both the ¹⁴C- and ³²P-labelled metabolites of the administered compound were incorporated into other phospholipid species.

When 1,2-di[1-¹⁴C]palmitoyl-*sn*-glycero-3-[³²P]-phosphorylcholine was fed to rats under similar con-

ditions to those described above, ¹⁴C and ³²P radioactivities were recovered in lymph choline phosphoglycerides only; no detectable label was found in other lymph phospholipid species. This latter result is in agreement with previous work (Scow *et al.*, 1967; Nilsson, 1968).

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The Effect of Polyoxin D on Morphogenesis in *Coprinus cinereus*

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Polyoxin D, a nucleoside antibiotic (Isono *et al.*, 1967), is a powerful competitive inhibitor of chitin synthetase (UDP-*N*-acetylglucosamine–chitin *N*-acetylglucosaminyltransferase, EC 2.4.1.16) in *Neurospora crassa* (Endo *et al.*, 1970). It has little effect on respiration or on synthesis of DNA, RNA and protein in test fungi (Sasaki *et al.*, 1968).

Polyoxin D inhibited the chitin synthetase activity in the microsomal preparation from homogenized stalks of fruit-bodies of the toadstool *Coprinus cinereus* (Schaeff. ex Fr.) S. F. Gray (= *Coprinus lagopus sensu* Buller). In an enzyme assay with 400 μM-substrate (UDP-*N*-acetylglucosamine), 5 μM-polyoxin D gave 50% inhibition.

Young excised stalks of the toadstools, with or without their caps, elongated *in vitro* when kept in a moist atmosphere overnight. The extent of the elongation was predictable and depended on the original size, with the larger stalks elongating as much as they would have done *in vivo*, and the smaller ones progressively less. When the cap was left on, normal morphogenesis occurred, with cap expansion, autolysis and release of viable spores. The active nature of the elongation and subsequent development was confirmed, as they could be prevented by dipping the basal cut ends of the stalks into solutions of metabolic inhibitors in water (e.g. NaCN, NaN₃, cycloheximide, 2,4-dinitrophenol, all at 50 μg/ml). This system has been used *in vitro* to study the effect of polyoxin D on morphogenesis.

The elongation and development of the excised fruit-bodies was totally prevented by 190 μM-polyoxin D and considerably diminished by 19 μM-polyoxin D. This inhibition suggests an intimate involvement of chitin synthetase in these processes.