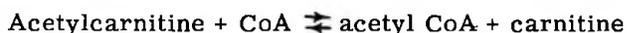


1965 #16

DISTRIBUTION OF CARNITINE, ACETYLCARNITINE AND CARNITINE ACETYLTRANSFERASE IN SPERMATOOZOA FROM VARIOUS SPECIES

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Carnitine acetyltransferase catalyzes the reaction:



Distribution of components of this reaction in various rat tissues has been investigated in detail (J. Biol. Chem., 240: 2193, 1965). Highest enzyme levels were found in spermatozoa and in the caudal epididymus from adult animals, and very high carnitine concentrations were present in reproductive tissues. The absolute in vivo dependence of enzyme system activity in reproductive tissues of the male rat upon testosterone maintenance (J. Biol. Chem., 240: 2197, 1965) led us to believe that this system may be of general importance in spermatogenesis. Along with direct approaches being attempted in an investigation of spermatogenesis in the rat, we thought it desirable to explore distribution of the components of the enzyme system in spermatoocytes, and/or testes from ripe marine organisms which could be readily collected at MDIBL. During August, 1965, these included Squalus acanthias, Pecten magellanicus, Echinarachnius parma and Hydractinia echinata. In addition, eggs were collected from several species for comparison. Samples were transported back to the University of Michigan in the frozen state for analysis, and only preliminary results have thus far been obtained. Scallop testis contained .035  $\mu$ moles carnitine per g dry weight while the ovary had 0.38  $\mu$ moles. Detectable carnitine was not present in sand dollar sperm and Hydractinia gonophores. It is our intention to analyze all specimens collected for content of carnitine and acetylcarnitine, and for levels of carnitine acetyltransferase as well as carnitine palmityltransferase activity. After this survey is completed, we intend to explore in detail the metabolism of spermatozoa from one of these species in an effort to determine what portion of total energy expenditure is derived from fatty acid metabolism and what role if any the carnitine acyltransferase system plays in sperm metabolism. The apparent absence of the enzyme system from sand dollar sperm would suggest that carnitine does not play an integral portion in spermatoocyte metabolism generally, and it will be of obvious importance to attempt to compare the above parameters with oxidative mitochondrial activity in sperm from various species.

1965 #17

THE RESPONSE OF BLOOD GLUCOSE AND LACTATE TO CATECHOLAMINES IN THE SKATE, Raja erinacea\*

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Mammalian insulin and glucagon produce a slight effect on blood sugar levels in the little skate, Raja erinacea. Handling and hourly removal of blood samples (0.10-0.60 ml/hr) produce

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