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WIPAPORN PHATVEJ: AGENTS AFFECTING CARNITINE UPTAKE IN THE ISOLATED CAPUT EPIDIDYIMIDIS OF RATS *IN VITRO*. THESIS ADVISORS: CHUMPOL PHOLPRAMOOL, Ph.D., PAWINEE PIYACHATURAWAT, Ph.D., GANYAPONG CHATURAPANICH, Ph.D., PANAS CHALERMSANYAKORN, M.D. 79 p. ISBN 974-663-929-3

Carnitine is accumulated against a very high concentration gradient in the luminal fluid of epididymis in most species. However, the mechanism of transport in this tissue is largely unknown in spite of the implication of carnitine in the regulation of sperm motility. This study, therefore, investigated the tubular uptake of ^3H -L-carnitine in sperm-free, isolated caput epididymidis of rats *in vitro*. Uptake of labeled carnitine showed saturation kinetics with an estimated Michaelis-Menton's K_m of $95.1 \mu\text{M}$ and V_{max} of $11.9 \text{ mmole/mg-60 min}$. The transport system exhibited stereospecificity for L-carnitine. The uptake was inhibited by a structurally related compound with a three-carbon backbone containing a terminal carboxyl group such as γ -butyrobetaine, acetylcarnitine and octanoylcarnitine. On the other hand, glycine enhanced the uptake, but trimethyllysine and γ -aminobutyrate failed to compete with carnitine. In addition, substrates which have been shown to interact with organic cation or anion transporters of many tissues, i.e. tetraethylammonium, N' -methylnicotinamide and cepharolidine, had virtually no effect on carnitine uptake in the epididymis. The uptake is highly temperature and Na-dependent. It was suppressed by the respiratory inhibitor, KCN, but not in the absence of glucose. Both sulfapyridine and sulfanilamides which are male antifertility agent, did not alter carnitine uptake. These results suggest that transport of carnitine across the basolateral membrane requires a carrier which is Na-dependent and stereospecific. The carrier is probably distinct from the organic cation or anion transporters. The source of energy for the transport system is primarily from the oxidative phosphorylation. The antifertility activity of some sulfonamides is not associated with their interferences with carnitine uptake in the caput epididymidis.