

Glucose Transport by the Intestinal Mucosa of the Dogfish

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A simple technique using the mucosal membrane of dogfish' gut to study the transport of glucose was presented. It was found that the mucosal membrane can transport glucose from the mucosal to the submucosal fluid against concentration gradients. This transport was greater at 36° than at 26°, and was inhibited by phlorizin, sodium azide, iodoacetic acid and uranyl acetate. Michaelis-Menten analysis of data has shown that the inhibition of glucose transport by phlorizin was competitive at 26° and non-competitive at 36°. It is postulated that a carrier system for glucose transport operates at the low temperature, while a more complicated mechanism handles glucose transport at 36°.

Studies on Photorecovery from Ultraviolet-induced Cleavage Delay in *Echinarachnius*

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Cleavage in many species can be delayed by ultraviolet (UV) irradiation of the gametes or of the zygote. Under certain circumstances this effect can be at least partially reversed by illumination with light in the spectral range 0.3 - 0.5 μ . The latter phenomenon, generally known as photorecovery or photoreactivation (PR), has been studied with the gametes of the sand dollar *Echinarachnius*.

After a UV dose of 2×10^7 ergs/cm.² just prior to fertilization, zygotes kept in the dark at 16° C. reach the midpoint of first cleavage in about 125 minutes and of second cleavage in about 185 minutes. The corresponding times for non-irradiated controls are about 90 and 135 minutes. Post-UV illumination will reduce (but not eliminate) the delay in first cleavage, but only if given during the first 50 minutes after fertilization. Illumination between this time and the onset of first cleavage has no effect on the delay in first cleavage, but does induce complete PR of the first-to-second cleavage interval.

It has been suggested (Blum *et al.*, J. Gen. Physiol. 35, 323, 1961) that the action of UV is primarily on the nuclear DNA, whereas PR requires the presence of some cytoplasmic constituents. The following observations in *Echinarachnius* support Blum's findings on *Arbacia*: (1) cleavage delay may be induced by UV irradiation of sperm, unfertilized eggs, or zygotes; (2) PR can occur after illumination of UV-irradiated eggs or zygotes; (3) PR does *not* occur after illumination of UV-irradiated sperm; (4) if UV-irradiated sperm are used to fertilize normal eggs, PR can again occur after illumination of the zygote.

Various attempts to photoreactivate sperm in homogenates of normal eggs have not been successful.