

Transports of phosphate and arsenate by everted gut sacs: a comparison

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(Introduced by Anuwat Dinudom)*

Arsenic and phosphorus belong to the same group in the periodic table. Are their transport mechanisms in the intestine similar? In order to answer this question a study was undertaken to compare these two transports in the everted sacs. The sacs were prepared from the upper intestine of discarded Swiss albino mice, which were being used in a different research project approved by the institutional committee of animal ethics. The sacs were incubated at 37° under an atmosphere of 100% oxygen in flasks containing mammalian Ringer solution of the following composition: NaCl 135 mM, KCl 11 mM, CaCl₂ 0.04m M dissolved in 2 mM phosphate buffer at pH 7.4 with or without sodium arsenate (2 mM). After one hour of incubation, loss of both the anions was observed in the mucosal solution. The serosal solution gained phosphate indicating the transportation of this anion from the mucosal to serosal side of the everted gut. But the serosal solution lost arsenate indicating an uptake of this anion. Thus unlike phosphate, arsenate is taken up from mucosal and serosal surfaces of the everted gut sacs. When included in the medium, the organic anion phenol red (100 µM) inhibited the uptake of both the anions by the gut. It was more effective when employed from the serosal side. Phenolphthalein at a similar concentration failed to mimic the action of phenol red. These results indicate that although they differ, both the transports share a common target that may be the site of inhibition exerted by phenol red.