

LETTER TO THE EDITOR

PHOSPHATE TRANSPORT BY THE EVERTED INTESTINAL AND GALLBLADDER SACS OF THE FROG

Sir,

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Phosphate transport has been extensively studied in all species, from bacteria to mammals (1). However the data on frog is scanty. Recent studies in toad show that the transport of phosphate occurs in the skin, intestine, and kidney (2). We tried to measure the transport of this inorganic anion in the everted intestinal and gallbladder sacs of the frog.

Pithed frogs of the species *Rana tigrina* were used for the experiment. Abdomen was opened by a midline incision and the duodenum was identified. The entire intestine, small and large, was isolated. After emptying the contents by flushing with Ringer solution, the entire gut was everted as described earlier (3, 4). The small intestine was cut into two equal pieces termed as proximal and distal intestine. Everted colon was used separately.

Gallbladder was identified and isolated by cutting the cystic duct and everted. The everted intestinal and gallbladder sacs were filled with amphibian phosphate Ringer solution which contained NaCl (17 mmol/l), KCl (3 mmol/l), CaCl₂ (1 mmol/l), MgCl₂ (1 mmol/l), NaH₂PO₄ (0.2 mmol/l) and Na₂HPO₄ (0.8 mmol/l) at pH 7.4.

The sacs were incubated in a beaker at room temperature containing 30 ml of

phosphate Ringer of the same composition for a period of one hour with continuous bubbling of air, with the help of a fish tank aerator. At the end of the incubation period the sacs were removed and blotted with filter paper. The contents of the sacs were emptied into individual test tubes. The samples from the external solution were also collected. All the samples were analyzed for phosphate content by auto analyzer.

The transport was assessed by the ratio of phosphate concentration of the fluid inside the sac to the concentration outside. A ratio of more than one is taken as evidence of active transport.

The present study indicates that, the gallbladder and both the segments of the small intestine except colon are capable of active transport of phosphate. The proximal segment showed the maximum transport,

TABLE I : Phosphate transport in intestine and gallbladder.

<i>Tissue</i>	<i>Inside/out side ratio</i>
Proximal intestine	1.5±0.09
Distal intestine	1.3±0.09
Colon	1.0±0.09
Gallbladder	1.3±0.11

All values are expressed as mean±S.E.M. of seven observations.

a pattern similar to that reported in mice (3).

Presence of active phosphate transport by the amphibian gall bladder has not been reported in any of the papers dealing with phosphate transport in various tissues. However, the physiological role and the

factors that influence this transport need to be further evaluated.

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