

THE FUNCTION OF THE PROXIMAL CONVOLUTED
SEGMENT OF THE RENAL TUBULE

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It now appears to be definitely demonstrated that the renal tubule is capable of both secretion and reabsorption. Very little, however, is known of the function of the histologically distinct segments of the tubule. The present research is an attempt to assign certain functions to the proximal convoluted segment.

For this study the toadfish (*Opsanus tau*) and the sculpin (*Myoxocephalus octodecimspinosus*) were used. The toadfish possesses only a proximal convoluted segment in its nephron, while the sculpin possesses this segment with the addition of a glomerulus.

Secretion by the proximal convoluted segment is proved by studies already reported on the toadfish. Experiments on the sculpin have shown that this segment can still secrete when a glomerulus is present. The glomerular kidney of the sculpin can be rendered functionally aglomerular by the injection of repeated large doses of phlorizin. Under these conditions secretory activity of the proximal segment can be quite marked. Using the urine/plasma ratio of glucose after small doses of phlorizin as a measure of glomerular filtrate, it is found that as much as 95 per cent of some substances may be secreted by the proximal convoluted segment when the glomerulus is functional.

The same histological type of cell in this segment in the glomerular kidney has been shown to reabsorb water, glucose, and chloride.

EXPERIMENTAL CYTO-PHYSIOLOGY ON
NEPHROCYTES OF UNISEGMENTED AGLOMERULAR
AND GLOMERULAR NEPHRONS

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According to the program of anatomical and physiological researches on the nephron outlined by Professor E. K. Marshall, a study of experimental cyto-physiology on nephrocytes was undertaken. Marine teleosts which possess very simple unisegmental nephrons of a single cell type were used. The toadfish (*Opsanus tau*) served for the study of the aglomerular nephron, while the sculpin (*Myoxocephalus octodecimspinosus*) as the glomerular nephron. As far as possible quantitative methods were employed to determine the functional and structural differences existing in the cells (nephrocytes).

The results obtained render possible a better understanding of renal secretion in the plurisegmental nephrons, as those of the mammals.

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