

mobranchs with respect to the electrophysiology of the gastric mucosa because of the clouded experiments reported for southern marine elasmobranchs (Am. J. Physiol. 203, 1091-93, 1962). In this study a potential as high as 12 mv, mucosa negative with respect to serosa, was recorded but the average potential in 6 elasmobranchs secreting acid was only -2.2 mv.

1970 #19

EFFECT OF VASOPRESSIN AND OSMOTIC GRADIENT ON INTESTINAL MEMBRANE OF Pseudopleuronectes americanus

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The small intestine of winter flounder mounted in a lucite chamber and bathed on both sides with Forster teleost Ringer, was used to study the effects of vasopressin and osmotic gradient on membrane permeability. In Forster Ringer solution a potential difference (PD) ranging from 1-5 mV was observed with the serosa being electronegative to the mucosa. On the addition of vasopressin to the bathing solution, the PD and short circuit current (I_{sc}) became less negative, suggesting an increased cation flux from mucosal to serosal surface. The action of vasopressin was further studied by determining its effect on the permeability coefficient of the intestinal membrane for H_2O , urea, thiourea and Na across the intestinal membrane. All K_{trans} values measured from mucosal-to-serosal side were greater than the values measured from serosal-to-mucosal. Vasopressin increased the permeability coefficient of each compound studied.

Table 1
EFFECT OF VASOPRESSIN ON INTESTINAL PERMEABILITY

Compound		No. of period/fish	Permeability coefficients K_{trans} . (10^{-7} cm sec $^{-1}$)	
			M→S	S→M
H_2O	control	16/10	350.5 ± 27	235.6 ± 20
	vasopressin	24/8	433.2 ± 19.4	351.5 ± 17
Urea	control	17/10	97.9 ± 9.0	66.1 ± 7.4
	vasopressin	24/8	149.5 ± 8.0	103.3 ± 6.8
Thiourea	control	14/10	94.9 ± 10.5	81.0 ± 10
	vasopressin	23/8	130.0 ± 8.3	94.4 ± 5.4
Na	control	8/6	145.2 ± 9.0	102.9 ± 6.4
	vasopressin	15/4	175.1 ± 7.0	133.3 ± 4.3

The effect of osmotic gradient on I_{sc} across the intestinal membrane is presented in Figure 1. When glucose or mannitol was added to the mucosal bathing fluid, the PD and I_{sc} became more negative. The increase of negativity was in the order of NaCl Ringer > Na_2SO_4 Ringer > LiCl Ringer > Choline Chloride Ringer. When glucose was added to the serosal side, both PD

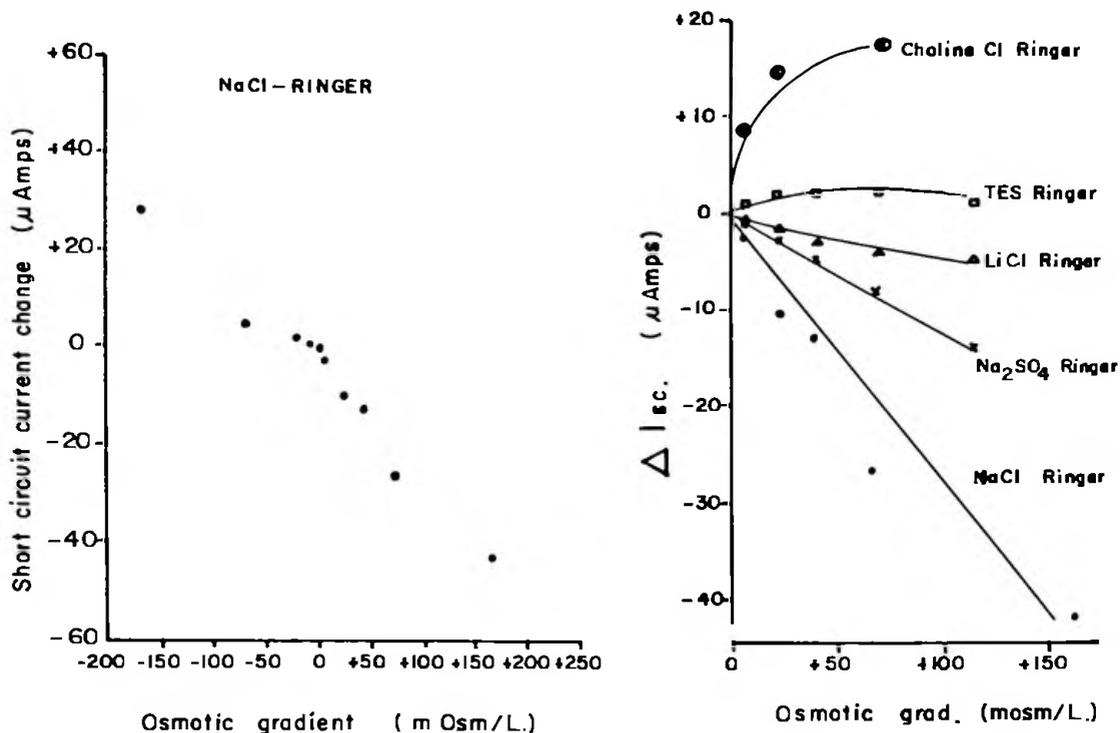


Figure 1. Effect of osmotic gradient on electrical measurement of flounder intestine.

and I_{sc} shifted toward positive values. The data suggest (1) that the intestinal membrane of flounder is more permeable to cations (Na or Li) than to anions (Cl); (2) unidirectional cation flux may be influenced by bulk flow of fluid moving in response to an imposed difference in osmotic pressure across the membrane.

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1970 #20

COMPENSATORY GROWTH OF THE INTESTINAL MUCOSA DURING SEAWATER ADAPTATION IN THE EEL (*Anguilla rostrata*): A BIOCHEMICAL ANALYSIS

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The migration of euryhaline fish to seawater involves a number of complex physiological adaptations. For example, after 3 weeks of seawater adaptation in the eel (*Anguilla rostrata*), intestinal H₂O absorption is markedly increased (Bull. MDIBL 9:16-18, 1969). In the intestinal mucosa, oxygen consumption (Bull. MDIBL 9:23-26, 1969), and the activity of Na⁺ - K⁺ ATPase (Bull. MDIBL 8:32-34, 1968; see also Mackay and Janicki this volume) are twice that seen in freshwater eels. In this report, some of the cellular and biochemical events which accompany