preliminary study, that this degree of sodium loading is associated with a significant reduction in sodium pump activity (^{86}Rb uptake) in the cardiac muscle and a less significant reduction in sodium pump activity in the aorta.

Further studies will be required to establish (1) whether this decrease in total ^{86}Rb uptake represents a suppression of a ouabain-sensitive active transport, (2) whether the change in sodium pump activity results from an increase in sodium concentration, an increase in another sea water electrolyte or is a less specific effect of increased extracellular fluid osmolarity, and (3) whether the modulation of vascular sodium pump activity is mediated by a circulating factor i.e., an "endoxin".

INTRACELLULAR CHLORIDE ACTIVITY IN THE ISOLATED RETINAL PIGMENT EPITHELIUM OF THE FROG, RANA CATESBEIANA

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The retinal pigment epithelium (RPE) is a single layer of cells located between the choroidal blood supply and the rod and cone outer segments of the neuroretinal system. The RPE serves as a transport pathway responsible for the exchange of metabolites and ions between the neuroretina and the choroidal blood supply. Active reabsorption of the subretinal fluid by the RPE is very likely a determinant factor in the maintenance of normal retinal adhesion. The transport functions of the RPE have only recently been described. In the toad and the frog preparation a trans-RPE potential difference of 5-30 mV (retinal side positive with respect to the choroidal side) and a net retinal to choroidal transport of chloride, accounting for about two-thirds of the short circuit current, was reported (Lasansky, A. and DeFisch, F.W., J. Gen. Physiol. 49:913-924, 1966; Steinberg, R.H. and Miller, S.S., Exp. Eye Res. 16: 365-372, 1973; DiMattio, J.A., Degnan, K.J., and Zadunaisky, J.A., Exp. Eye Res., in press, 1982).

It has been suggested that along with the apical (retinal) NaK -ATPase pump, there exists an apical Na-Cl coupled transport system which is driven by the Na gradient across the apical barrier. To test this hypothesis in the present study we have analyzed the intracellular Cl activity of the RPE.

After removing the retina and the sclera, hemisections of RPE from the bullfrog (Rana catesbeiana) were horizontally mounted between Sylgaard discs in a modified Ussing type chamber. The transepithelial potential difference was recorded continuously and conventional microelectrodes were employed to measure the electrical potential difference across the apical membrane (Figure 1). Cl-sensitive microelectrodes were prepared following the method

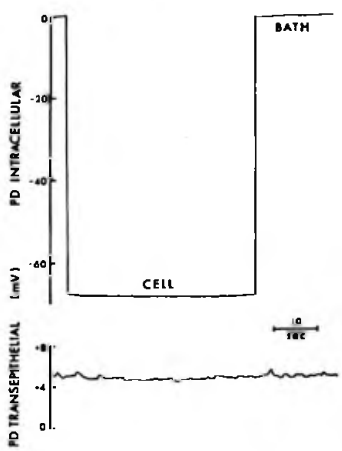

Figure 1.--Original recording of an intracellular membrane potential across the apical membrane of the retinal pigment epithelium. Transepithelial potential was measured simultaneously.

described earlier (Hansen, L.L., Koch, M., Wiederholt, M., Exp. Eye Res. 29:367-378, 1979). Essentially the electrodes were silanized (2% silicone 1107, Dow Corning) and filled with a new chloride liquid ion exchange

(Corning 477913). Intracellular recordings were accepted when readings were stable for at least 5 seconds. In 6 isolated RPE preparations 8 successful intracellular measurements of chloride potentials could be obtained. The most stable single recording is shown in Figure 2. The mean of 22 intracellular potential differences (conventional

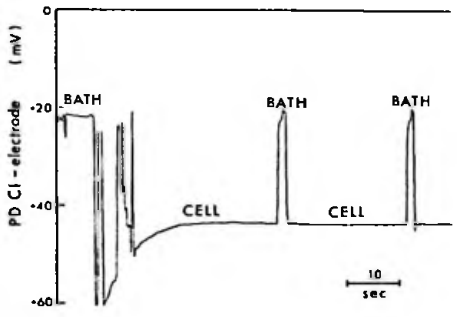

Figure 2.--Cl-potential across the apical membrane of the retinal pigment epithelium.

microelectrodes) was used to calculate the intracellular chloride activity. The data are summarized in Table 1. A

Table 1.--Intracellular Chloride Activity in the Retinal Pigment Epithelium

Potential Difference across the apical membrane	-65.1 ± 1.8 mV	n = 22
Observed intracellular chloride activity	14.3 ± 1.6 mM	n = 8
Predicted intracellular chloride activity (E_{Cl} = -37.8 mV)	6 mM	

mean intracellular PD of 65.1 mV (range 52-79 mV) and a mean intracellular chloride activity of 14.3 mM (range 8.8-22.9 mM) were obtained. Thus the chloride activity in RPE is significantly above the value predicted from passive distribution of chloride ions across the epithelial cell membrane. In summary, in the retinal pigment epithelium an active uptake of chloride across the apical (retinal) cell membrane has been demonstrated confirming the proposed model for transepithelial chloride transport in this tissue. The model consists of Na active transport from choroidal to retinal side plus chloride and bicarbonate transport from retinal to choroidal side. The finding of higher Cl activity in the cells than predicted by the electrochemical gradient permits the location of the Cl entry in the basolateral border.

ACTION OF PAPAVERINE, BAY K 5552 AND INTERACTION WITH cAMP IN THE ISOLATED FROG CORNEAL EPITHELIUM

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The regulation of chloride secretion by the corneal epithelium is mediated by stimulation of receptors that increase the content of cAMP in the epithelium (Klyce, Neufeld and Zadunaisky, Invest. Ophthalmol. 12:127-139, 1973). The catecholamines, induce a large increase in chloride current (Chalfie, Nuefeld and Zadunaisky, Invest. Ophthalmol. 11:644-650, 1972). Several other receptors, that are known to activate adenylate cyclase, have also been found in this epithelium including an adenosine receptor (see Spinowitz and Zadunaisky, Amer. J. Physiol. 237:F121-127, 1979).