did not support the presence of a carrier-mediated efflux across the apical surface.

The characteristics identified for taurine transport in the flounder brush border membrane vesicle are similar to those that have been found in mammalian renal brush border membranes studied. In the latter species, however, the kidney epithelium displays a net reabsorption of taurine. It is likely that the difference between net secretion in fish and net reabsorption in mammals results in part from a low rate of taurine uptake across the apical membrane in fish. In this light, it is important to reemphasize the difference in the rates of uptake by the vesicles for glucose and alanine, both known to be almost completely reabsorped by the fish kidney, versus the rate of taurine accumulation (Figure 1). The fish renal epithelium is characterized by a high rate of taurine transport across on the basolateral membrane, a low rate for its accumulation across the brush border membrane, and concentration gradients favoring net efflux from both "sides" of the cell. As a result, there is a bidirectional flux of taurine across both membranes which results in a net influx of taurine at the basolateral membrane and a net efflux at the apical membrane. The relatively high cellular concentration of taurine, therefore, is due to uptake across the basolateral membrane. This in turn provides the large concentration gradient favoring the exit of taurine from the cell into the lumen by simple diffusion.

MICROELECTRODE STUDIES OF THE SKATE GASTRIC MUCOSA

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Microelectrode studies require a free air-fluid interface, thus precluding an "air lift" circulating system, and requiring a pump to recirculate fluid. The PVC tubing used in peristaltic pumps emits some substance which inhibits gastric acid secretion in frog, skate and dogfish; silicon tubing is satisfactory. However, dogfish mucosae seem contaminated by some microorganism which rapidly proliferates in the tubing, inhibiting secretion in the tissue from which derived, as well as other tissues. We could never produce satisfactory secretion in dogfish using the pump system.

The gastric mucosa of the little skate (Raja erinacea) will secrete acid, if care is taken to maintain clean and uncontaminated tubing. Of 21 tissues, 18 produced satisfactory secretory rates, averaging 2.7 ± 0.20 $\mu Eq/cm^2 \cdot hr$ (mean $\pm$ SE), which is somewhat higher than expected in dogfish at 1 atm total pressure (Kidder, Am. J. Physiol. 231:1240,). Transepithelial resistance (Rms) was 152 ± 12 ohm$\cdot cm^2$; short circuit current (Isc) was -1.0 ± 2.1 $\mu A/cm^2$, or indistinguishable from zero. Thiocyanate (SCN, 10 mM, serosal) inhibits secretion and raises Rms, as in other species.

Microelectrode studies were performed to determine the intracellular potential (Vmc) for this tissue, monitoring Vmc, fractional resistance (fr - $\Delta Vmc/\Delta Vms$ for a current or voltage pulse) and the tip resistance of the electrode. When these were steady for 10 seconds and of reasonable value, the data were extracted and used to produce Figure 1.

Two clusters of values are observed, which are identified in Figure 1 and summarized in Table 1. The "O" cluster (oxyntic cells?) has its Vmc but not fr reduced by SCN; the "S" cluster (surface epithelial cells?) has its fr increased with no change in Vmc.

The current-voltage plot was explored by voltage clamping to different potentials for 1 sec, recording the current required to maintain this potential. In all cases, the steady state clamp potential was zero, and the potential was alternated between positive and negative displacements. The current-voltage plots consist of straight lines intersecting at breakpoints, as previously found for dogfish (Kidder, Bull. MDIBL 18:4, 1978). In 37 such experiments performed under secreting conditions in 18 tissues, a breakpoint was found at -8.2 ± 0.5 mV, or 38.8 ± 4.1 $\mu A/cm^2$. In 25 of these experiments, a second breakpoint was found at 43.0 ± 1.4 mV, 186 ± 6.9 $\mu A/cm^2$. Although it is conventional to refer to breakpoint voltages, there is no indication from these data that the breakpoint voltage is more stable than the breakpoint current. Supported by NIH AM 27229 to George W. Kidder, III.

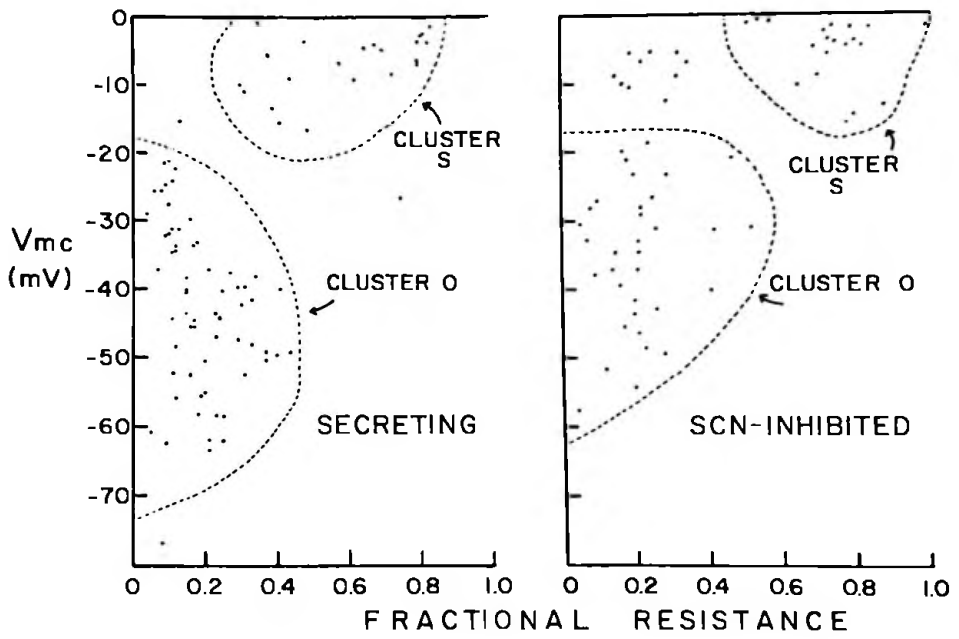

TABLE 1.--Intracellular potential and fractional resistance for two presumptive cell types

CONDITION	CLUSTER "O"		CLUSTER "S"	
	Vmc (mV)	fr	Vmc (mV)	fr
SECRETING (16 tissues)	-42.6 ± 1.5	0.19 ±0.01	-7.4 ±1.0	0.60 ±0.04
	N = 61		N = 20	
SCN-inhibited (16 tissues)	-34.4 ± 1.8	0.21 ±0.02	-5.8 ±1.2	0.75 ±0.02
	N = 32		N = 17	

SCN lowers cluster "O" intracellular potential ($P < 0.01$), but has no effect on cluster "O" for fractional resistance. If the SCN measurements at $fr < 0.5$ are all assigned to cluster "O", this Vmc drops to -28.8 ± 2.2 mV. SCN does not change cluster "S" potential, but does raise cluster "S" fractional resistance.

HEPATIC HANDLING OF GLYCOPEPTIDE ANTIFREEZE IN NORTHERN FISHES

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In mammalian species, asialo glycoproteins are rapidly cleared from the circulation by a hepatic receptor mechanism mediated process which recognizes the galactose moieties (Ashwell and Morell, Adv. Enzymol. 41:99, 1974; Hudgen et al, J. Biol. Chem. 249:5536, 1974). In birds and reptiles a similar system which binds N-acetyl-glucosamine exists (Lunney and Ashwell, Proc. Nat. Acad. Sci. U.S.A. 73:341, 1976; Kawasaki and Ashwell, J. Biol. Chem., 252:6536, 1977). Recently Ashwell and Morgan (Carbohydrate-Protein Interaction, Am. Chem. Soc., 1979) have demonstrated the absence of hepatic glycoprotein receptors in the striped bass (Morone soxatilis). Turnover studies in a