

would be ordinarily expected for electrolyte solutions of the usual monovalent type. The alkaline properties of the gland fluid are satisfactorily explained by primary secretion of OH^- , with buffering by CO_2 . The process is catalyzed by carbonic anhydrase in two of the species (R. erinacea; R. ocellata) studied but not in R. stabuloforis. If the enzyme is inhibited in the two former species during production of fluid, the accumulation of OH^- and CO_2 is decreased.

Histologic studies show a highly active epithelial surface. There are vesicular nuclei, well developed Golgi apparatus, abundant mitochondria, apical basophilia and brush border. The secretory surface is backed by dense connective collagenous tissue interspersed with smooth muscle. The gland is very vascular.

The function of the gland remains unknown. Its fundamental interest for us lies in its alkaline secretion and anion pump, which also provide a useful analogy to gastric and pancreatic secretions. A final publication is being submitted to Comparative Biochemistry and Physiology.

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ALVEOLAR GAS EXCHANGE IN THE HARBOR SEAL, Phoca vitulina

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Data concerning alveolar gas exchange in the seal are sparse. The use of a rapid acting infrared CO_2 analyzer and a specially designed face mask permitted the determination or calculation of the various gas exchange parameters. Studies were performed in duplicate in 6 young female animals. The mean values obtained were as follows: PaCO_2 : 49 mm of Hg; V_E : 4.5 liters/min; respiratory frequency: 22 breaths/min; CO_2 production: 174 ml/min; O_2 consumption: 217 ml/min; respiratory exchange ratio: 0.80; alveolar ventilation: 2.6 liters/min; physiologic dead space: 89 ml; calculated alveolar oxygen tension: 100 mm of Hg.

The following conclusions are indicated:

1. The basal alveolar CO_2 tension of the seal is significantly higher than that of the resting human.
2. Minute volume, alveolar ventilation, respiratory dead space, resting oxygen consumption and CO_2 production and alveolar O_2 tensions are in the same range as those found in the human when corrected for the difference in mass of the two species.
3. The resting respiratory exchange ratio is consistent with the high protein intake of this animal.

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INTRACELLULAR ELECTROLYTE PATTERNS IN DOGFISH. I. ERYTHROCYTE

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The composition of plasma and extracellular fluid in the elasmobranch differs markedly