

This value exceeds the filtration rate by a factor of about 3. Therefore if these preliminary results are valid more fluid is excreted than that which is filtered. This is quite possible since many nephridia have no nephridiostome and presumably must function by tubular secretion.

Techniques for micropuncture studies in vivo of the nephridia were developed. Analysis of nephridial fluid will be made in later experiments.

Supported by NIH, Grant No. AM-09975-03.

1968 #35

THE MISSING MILLIEQUIVALENT- H^+ BALANCE DURING METABOLIC ALKALOSIS IN THE DOGFISH, Squalus acanthias

Jan Smith, H. V. Murdaugh, and Eugene D. Robin, Department of Medicine, University of Pittsburgh, Pittsburgh, Pa.

Previous studies have shown that following a bolus intravascular injection of $NaHCO_3$ in Squalus acanthias there is a rapid increase in blood pH and HCO_3^- concentration followed by a rapid progressive return to normal values over several hours (Bull. MDIBL 4-4:75, 1962). This return to normal is not accompanied by changes in urinary pH nor is it quantitatively accounted for by intracellular buffering. The present studies were designed to define the quantitative kinetic processes responsible for the return to normal acid-base values and to attempt to define the anatomical sites of buffering and HCO_3^- excretion. Six animals were studied. The rate of restoration of normal acid-base values was estimated by sequential measurements of arterial pH, pCO_2 and HCO_3^- concentrations. Gill net H^+ excretion and renal net H^+ excretion were measured as previously described.

Restoration toward normal values occurs at a rate consistent with approximately 1.0 to 1.5 mEq/Kg/hour HCO_3^- loss. Urinary pH remained unchanged and preliminary studies of urinary titratable acid and ammonia excretion do not account for the observed HCO_3^- loss. Direct penetration of coelomic fluid by HCO_3^- occurred, but buffering in this compartment accounted for less than 0.25 mEq. Preliminary studies of gill HCO_3^- excretion do not indicate substantial changes during control versus HCO_3^- loading periods. Measurements of renal and gill TMA and TMAO are now in process.

Although gill excretion is possible, the precise locus of this regulation has not been established and approximately 1 mEq of HCO_3^- /hour is still missing.

1968 #36

THE DEVELOPMENT OF APOLAR EMBRYOS OF Fucus vesiculosus L. IN SUCROSE-SEA-WATER

John G. Torrey and Harry L. Phillips, Jr., Harvard University, Cambridge, Mass.

Using cytological methods developed over the past several years, it has been possible to prepare squash preparations of Fucus embryos in which accurate nuclear counts can be made of developmental stages up to about ten days following fertilization. These data provide a quan-