Comparative Study of the Ribonucleases of Several Marine Species

Christian B. Anfinsen
National Heart Institute

As a part of a general program of study of the molecular basis of enzymatic function, it was of interest to examine the pancreas of pyloric caecal glands of several marine animals in regard to their content of ribonuclease activities and to their comparative biochemistry. Acetone powders were prepared from the pancreas of the dogfish, from hepatopancreas of the common mussel and from the pyloric cecum of the starfish. Extracts prepared from these powders by the method described originally by Kunitz for bovine pancreatic ribonuclease were studied with respect to the stability of the ribonuclease activity to heat, hydrogen ion concentration and high concentrations of urea. Most of the work was carried out using the starfish material. The ribonuclease present in this tissue was relatively heat-stable although not as stable as the enzyme from bovine pancreas. Its activity was decreased to about 25% of the control value when assayed in the presence of 8 M urea. Preliminary experiments on ion exchange resin columns and by ammonium sulfate fractionation suggested that the general properties of the starfish enzyme in terms of its chemical behavior might not be too dissimilar from those of the beef enzyme. Further studies on the purification and characterization of the enzyme from this source will be required before adequate comparison can be made.

Urinary Excretion of Divalent Ions and Organic Bases in the Aglomerular Goosefish, Lophius americanus

Fredrik Berglund, Roy P. Forster, Richard Malvin, and Barbara Rennick

Boston University School of Medicine, Dartmouth College, University of Michigan, and State University of New York

Divalent ions

Earlier studies have demonstrated that divalent, i. e. Mg^{++}, Ca^{++}, and $SO_4^{=}$, are actively secreted by renal tubules of the aglomerular goosefish; the concentration of these ions in blood and urine rises after capture when the animals are kept in tubs with running sea water. Thus maximal tubular secretory rates are often reached spontaneously and these vary widely from one animal to another.

The present work was concerned with the specificity of the transport mechanisms for these ions, particularly with respect to