The molecular organization of nerve membranes. II. Glycolytic enzymes and ATP synthesis by plasma membranes of squid retinal axons

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The following glycolytic enzyme activities were demonstrated in membrane fractions isolated from squid retinal nerve: phosphoglyceric kinase, pyruvic kinase, glyceraldehyde-3-phosphate dehydrogenase, aldolase, glucose-6-phosphate dehydrogenase, and hexokinase. After two additional washings with a hypotonic solution, only two of them, glucose-6-phosphate dehydrogenase and pyruvic kinase, were solubilized. The incubation of these membranes with ADP or GDP and Pi resulted in the incorporation of Pi into the diphosphate. The reaction product was identified as ATP or GTP. No esterification was obtained with CDP or UDP as Pi acceptor. The enzyme system responsible for the synthesis of the nucleotide triphosphate was demonstrated to be membrane bound, and not due to soluble or mitochondrial contamination of the membrane fraction. The possible role of this system is discussed.