

Reduced Mg^{2+} -ATPase Activity in the Hypoglycemic Adult Rat Brain

Stylios Tsakiris^{a,*}, Christos Koromilas^a, and Kleopatra H. Schulpis^b

^a Department of Experimental Physiology, University of Athens, Medical School, P. O. Box 65257, GR-154 01 Athens, Greece. Fax: 00301 7775295

E-mail: stsakir@cc.uoa.gr

^b Institute of Child Health, "Aghia Sophia" Children's Hospital, GR-115 27 Athens, Greece

*Author for correspondence and reprint requests

Z. Naturforsch. **56c**, 912–914 (2001);

received June 26/August 8, 2001

Hypoglycemic Brain, Brain Mg^{2+} -ATPase, Brain Na^+ , K^+ -ATPase

The effects of different α -D-Glucose (Glu) concentrations (0–16 mM) on Na^+ , K^+ -ATPase and Mg^{2+} -ATPase activities were investigated in homogenates of adult male rat whole brain at 37 °C. The enzyme activities were determined after 1h preincubation with Glu. Brain Na^+ , K^+ -ATPase was not affected by Glu different concentrations. On the contrary, Mg^{2+} -ATPase activity was considerably reduced with Glu concentrations lower than 4 mM. The enzyme was inhibited 40%, 50% or 80% with 3, 2 or 1 mM of Glu, respectively. The above results suggest: a) The various concentrations of Glu have no effect on brain Na^+ , K^+ -ATPase activity. b) The inhibited brain Mg^{2+} -ATPase in hypoglycemia produces low intracellular Mg^{2+} , which could modulate the activity of Mg^{2+} -dependent enzymes and the rates of protein synthesis and growth of the cell.