Acta Physiologica Hungarica, Volume 83 (4), pp. 333–342 (1995)

Changes of the 78 kDa glucose-regulated protein (grp78) in livers of diabetic rats#

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Received March 29, 1995
Accepted May 7, 1995

The 78 kDa glucose-regulated protein (grp78) is an abundant member of the 70 kDa molecular chaperone family in the lumen of the endoplasmic reticulum participating in the quality control of secretory proteins. In the present paper we have analysed the synthesis and level of grp78 in livers of control, streptozotocin-diabetic, and the spontaneously diabetic Zucker rats. The level of grp78 mRNA significantly decreased in streptozotocin-diabetic rats. The effect was reversed by insulin treatment. In case of Zucker rats we did not detect any significant change in grp78 mRNA, grp78 protein level showed opposite changes being essentially unchanged in streptozotocin-diabetes and significantly reduced in Zucker rats. Autoradiograms of Ca-dependent phosphorylation of postmitochondrial supernatants of control and streptozotocin-diabetic livers indicated no significant changes in the 70 kDa region. Decrease in the availability of grp78 may participate in the attenuation of hepatic protein secretion in diabetes.

Keywords: diabetes, glucose regulated proteins, chaperones, heat shock proteins, insulin, protein phosphorylation

This paper is dedicated to the memory of Professor Tibor Kovács (1929–1994), who actively participated in the initiation of this project, and whose talent and spirit helped a lot to those who were privileged to know him.

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0231-424X / 95 / $5.00