

Study of action of low molecular weight components separated from adult rat pancreas thermostable protein complex

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Introduction. Most cellular processes are carried out by multiprotein complexes. Hence the important subject of studying is the identification of endogenous protein factors, regulating processes in cells, and its use in the treatment of pathologies. It is known that the thermostable protein complex (TPC) from the adult white rat pancreas, liver, brain and heart through inhibition of transcription decreases cell mitotic activity in the growing rats. TPC is characterized with tissue specificity, that occurs with respect to terminally differentiated cells but it does not show species specificity. The electrophoretic mobility of the protein complex obtained from various tissues is similar (two subgroup of the proteins with mass 12-17 kd and 40-60 kd). At the same time, has not yet determined the contribution of subfraction from cell proteome in above mentioned effects.

The aim of our work was the separation of components with low molecular weight from rat pancreatic thermostable protein complex and study its effect.

Research objects and methods: Investigations were carried out on adult (120-150 g) and infant (8-10) rats. Used methods: the alcohol extraction of thermostable protein complex from adult rat pancreas; the fixation and the preparation of tissue slices for light microscope; determination of mitotic index and native electrophoresis in polyacrylamide gel.

Results: In order to separate the component with low molecular weight from the adult rat pancreatic TPC, the part of the polyacrylamide gel containing this subfraction had been cut out, homogenized, separated from gel and lyophilized. The solution was prepared from lyophilized material and injected intraperitoneally in rats (100 µg/100µl). It was found that low molecular weight subfraction of pancreatic TPC causes decreasing of proliferative activity of hetero- and homotypic tissue in the infant rat. In particular, mitotic index cells of pancreas, liver and heart in experimental animal decreased on average by 50% compared to controls.

Conclusions: The active component of the thermostable protein complex obtained from adult rat pancreas is the fraction with low molecular weight that has ability to inhibit the cell proliferation in either the homo and heterotypic tissues of infant rats.