

Extracellular matrix in experimental hepatocarcinoma-29

Makarova V.*, Bgatova N.

Research Institute of Clinical and Experimental Lymphology – Branch of the Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

*shedina_vika@mail.ru

Key words: hepatocellular carcinoma, extracellular matrix, PAS-reactoin

Motivation and Aim: Hepatocellular carcinoma (HCC) is one of the most aggressive human tumor with a high mortality rate [1]. Despite the fact that this is a frequently occurring tumor, the mechanisms of its pathogenesis and metastasis are not fully understood, and the existing therapy often fails [2]. There is evidence that in patients with HCC, changes occur in the microenvironment of the tumor tissue, including the extracellular matrix (ECM), stimulating the growth and metastasis of HCC cells [3]. Therefore, the aim was to study form of ECM in the tumor during spontaneous development and lithium carbonate treatment.

Methods and Algorithms: The research was carried out on male mice of the CBA line. Hepatocarcinoma-29 (G-29) cells were used to induce the tumor. Animals were divided into 2 groups: 1 – animals with tumor growth; 2 – animals with tumor and lithium carbonate treatment. The material was taken on the 30th day of the experiment. Staining of tissues was carried out by the method of PAS-reaction. Morphometric analysis of tumor tissue was performed.

Results: It was found that part of the PAS-positive patterns had gaps and contained erythrocytes. While the other part did not have visible gaps, therefore it is impossible to judge their functional state. The volume density of PAS-positive patterns in tumor in condition spontaneous development was significantly higher than in lithium carbonate treated animals. There is evidence that ECM is actively involved in the processes of carcinogenesis and metastasis of HCC. At the same time, the levels of proteoglycans increase [4]. Apparently, lithium carbonate inhibits the formation of proteoglycans in the ECM, thereby suppressing tumor growth and development.

Conclusion: The state of the ECM is an indicator of tumor growth. A decrease of the PAS-positive components volume density in the tumor tissue after the lithium carbonate using may be the result of G-29 growth suppression.

Acknowledgements: The work was carried out at the expense of budget financing within the framework of the state task on the topic No. FWNR-2022-0012.

References

1. Chedid M.F., Kruel C.R.P., Pinto M.A., Grezzana-Filho T.J.M., Leipnitz I., Kruel C.D.P., Scaffaro L.A., Chedid A.D. Hepatocellular carcinoma: diagnosis and operative management. *Arq Bras Cir Dig.* 2017;30(4):272-278.
2. Ogunwobi O.O., Harricharran T., Huaman J., Galuza A., Odumuwagon O., Tan Y., Ma G.X., Nguyen M.T. Mechanisms of hepatocellular carcinoma progression. *World J Gastroenterol.* 2019;25(19):2279-2293. doi: 10.3748/wjg.v25.i19.2279.
3. Pickup M.W., Mouw J.K., Weaver V.M. The extracellular matrix modulates the hallmarks of cancer. *EMBO Rep.* 2014;15:1243-1253.
4. Nault J.-C., Guyot E., Laguillier C., Chevret S., Ganne-Carrie N., N'Kontchou G., Beaugrand M., Seror O., Trinchet J.-C., Coelho J. Serum proteoglycans as prognostic biomarkers of hepatocellular carcinoma in patients with alcoholic cirrhosis. *Cancer Epidemiol Biomarkes Prev.* 2013;22:1343-1352.