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Fund “Nauka” Project № 15011 Resume

“In situ analysis of relationships between glial, neuronal and tumor cells in colorectal cancer”

Project leader: Prof. Nikola Kolev, MD, PhD, DSc

Colorectal carcinoma (CRC) is the second most common cause of death by cancer in the developed countries. It accounts for about 25% of all oncological diseases. It is believed that CRC originates from epithelial progenitor cells following gene mutations in those cells. The current study aims to examine colectomy specimens on a tissue level via assessing the relationship between nerve cells, blood vessels and epithelial progenitor cells in the colonic crypts.

Biopsy specimens (cancer tissue and the normal colonic wall) will be embedded in paraffin, stained with hematoxylin and eosin followed by immunohistochemistry. Our focus will be on the regions with the tumor tissue interaction with the nerve structures. We shall study different cell types (nerve cells, glia, endothelial cells, pericytes, epithelial progenitor cells) with their spatial relationship between them, in the tumor tissue or the normal tissue. Further, immunohistology of the glial cells, nerve cells and nerve appendages in the tumor tissue will be evaluated using a comparative analysis of the density of these cell types within the tumor tissue and within the normal colonic wall. The study uses a panel of primary antibodies, which include markers for the tumor – nerve structure relationship: GFAP- enteric glia marker; NGF - neurotrophic factor and neuropeptide primarily involved in the regulation of growth, maintenance, proliferation, and survival of certain target neurons; CD31 – marker for the presence of endothelial cells in histological tissue sections. Our research will show the relationship between the progenitor epithelial cells and the nerve and the glial cells in colorectal carcinoma microenvironment along with the role of this relationship and tumorigenesis of colorectal carcinoma.