

FUSOBACTERIUM NUCLEATUM IN COLORECTAL CANCER**Gulmira Kulmambetova¹, Botakoz Kurentay¹, Dina Bayanbek¹, Alua Gusmaulemova¹**¹LLP «National Center for Biotechnology», Astana, 010000, Kazakhstan

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Background: Colorectal cancer is one of the most significant oncological diseases in the world due to its high morbidity and mortality. *Fusobacterium nucleatum* is an anaerobic bacterium that is actively studied in the context of colon carcinogenesis, since abundant seeding with this infection is observed in tumor tissues. We studied the prevalence and identification of associations of *F.nucleatum* with molecular demographic characteristics of Kazakhstani patients with colorectal cancer.

Materials and methods: We analyzed biomaterial from 113 patients with colorectal cancer of three intestinal locations (tumor, adjacent tissue, and distant normal tissues) by qPCR/ddPCR.

Results: *F.nucleatum* was detected in intestinal tissues by qRT-PCR using the target gene nusG and the internal control gene SLCO2a1. Using Ct values, we conducted statistical analysis of the prevalence of *F.nucleatum* and its correlation with patients' clinical characteristics in R. *F. nucleatum* was detected in 35.4% of adenocarcinoma samples, which is significantly different from the presence of the bacterium in adjacent and distant normal tissue

samples ($P=0.02$). Tumor size, its location and consumption of processed meat were found to significantly correlate with the abundance of *F.nucleatum* ($P < 0.05$). Expression of IL1B, IL6, IL10, IL17, TNF genes causing an inflammatory response was measured by digital dd-PCR. The concentration of IL1B, IL6 genes significantly differed between tumor tissues and normal tissues ($P<0.05$). A significant positive correlation was found between the prevalence of *F. nucleatum* and the expression of IL17 and a negative correlation with IL-6 ($P<0.05$).

Conclusion: The frequency of *F. nucleatum* occurrence is higher in tumor tissues compared with normal intestinal mucosa ($P<0.05$). We established a connection between *F. nucleatum* and colorectal cancer through its effect on inflammation, the immune system and tumor growth.

Acknowledgement: We express our gratitude to the National Scientific Oncology Center of Astana for their cooperation and biomaterial collection.

Key Words: *Fusobacterium nucleatum*, colorectal cancer, qRT-PCR, tumor