

IPH AP09260597 «Detection of biomarkers of bacterial translocation in the early diagnosis of infectious and inflammatory complications in patients with bowel obstruction of tumor origin».

Relevance

Based on changes in bacterial translocation biomarkers in the blood serum, it's suggested that patients with researched pathology can be stratified according to the risk level of developing infectious and inflammatory complications. It will be possible to take preventive measures to reduce the frequency and severity of these complications and mortality. This method will be a reliable, quick and less expensive, without need for invasive collection of Mesenteric lymph nodes and detection of 16s rRNA. It will be possible to revise the criteria for the diagnosis "sepsis" in these patients: a high level of bacterial translocation biomarkers, the presence of systemic inflammatory response syndrome and organ dysfunction, will allow early diagnosis of sepsis even without an obvious focus of infection.

The aim is to determine the diagnostic and prognostic significance of bacterial translocation as the complications development's predictor in patients with acute bowel obstruction of tumor and non-tumor origin by assessing the relationship of LBP, sCD-14 in the systemic circulation with the detection of microorganism genes in mesenteric lymph nodes.

Expected results

- at least 1 (one) articles and (or) reviews in peer-reviewed scientific journals indexed in the Science Citation Index Expanded of the Web of Science database and (or) having a CiteScore percentile in the Scopus database of at least 50 (fifty); as well as at least 1 (one) article or review in a peer-reviewed foreign or domestic publication recommended by CSES
- Obtaining at least 1 security document (certificate of intellectual property) from the Kazakhstan Patent Office on the subject of research work.
- Expected scientific and socio-economic effect:

New information will be obtained on the mechanisms of the bacterial translocation development in patients with colon tumors, the effectiveness of tests for the detection of bacterial translocation will be established, ways of their rational use for scientific and practical purposes will be proposed, innovative methods will be introduced in scientific research, practical health care, and medical education.

- Applicability of the obtained scientific results: the proposed methods for detecting biomarkers will allow further studies of bacterial translocation. Some of diagnostic methods can be used in practical health care. Improving the image of Collective Use Laboratory will help to attract investment and conduct research by the scientific groups of Kazakhstan and foreign partners. The development of modern high-tech research methods will create the prospect of commercialization in the form of creating a learning platform (master classes, advanced training, specialization in the workplace, etc.).

Research group

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Results achieved

The detection of translocation in the systemic circulation using biomarkers (sCD-14, LBP) in operated colorectal cancer patients with and without acute bowel obstruction was performed.

The methodology and a standard procedure for the detection of bacterial DNA using molecular genetic analysis in mesenteric lymph nodes were developed.

The molecular genetic study was carried out for the detection of microbial DNA in mesenteric lymph nodes in operated colorectal cancer patients with and without acute bowel obstruction.

A comparative analysis of the characteristics of the course of bacterial translocation, as well as its relationship with the development of a systemic inflammatory reaction and infectious and inflammatory complications in operated colorectal cancer patients with and without acute bowel obstruction was conducted.

Information for potential users

Target consumers of results: researchers, doctors; patients with complications of bacterial translocation.

Spreading of project results: publications in native and foreign journals, implementation in the educational process when teaching theoretical and clinical disciplines, Research Based Learning project development.

Scientific publications within the framework of the project

1. Yermek Turgunov, Alina Ogizbayeva, Lyudmila Akhmaltdinova, Kayrat Shakeyev. Lipopolysaccharide-binding protein as a risk factor for development of infectious and inflammatory postsurgical complications in colorectal cancer patients // Contemp oncol (Pozn). – 2021. – V. 25 (3). – P. 198-203. DOI: <https://doi.org/10.5114/wo.2021.110051> (Scopus Contemporary Oncology - Współczesna Onkologia - Q2, percentile 54).
2. Alina Ogizbayeva, Yermek Turgunov Bacterial translocation in colorectal cancer patients//J. CLIN. MED. KAZ. – 2021. - Volume 18. – Issue. – 3. - P. 8-13. <https://doi.org/10.23950/jcmk/10926> (recommended by CQES by order No. 190 dated 03/02/2021).
3. Ogizbayeva A.V., Kadyrova I.A., Turgunov Y.M., Shakeyev K.T., Kolesnichenko S.I., Savazova K.S. Certificate of entering information into the state register of rights to objects protected by copyright No 19250 dated July 8, 2021 "Detection of microorganisms in mesenteric lymph nodes by the molecular genetic method in patients with colorectal cancer" (a work of science).