Medical Xpress

Bioinformaticians find way to personalize drug prescription against stomach cancer

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Stomach cancer. Credit: Depositphotos

Researchers from the Moscow Institute of Physics and Technology and their colleagues have developed the first technique for personalizing stomach cancer therapy based on RNA sequencing of tumor cells. The study, supported by the Russian Science Foundation, was published in

Cold Spring Harbor Molecular Case Studies.

Stomach cancer is the fifth-deadliest oncological disease. It is seldom diagnosed in the early stages, which complicates treatment. There are several treatment options available that rely on chemotherapy and therapeutic antibodies. However, patient response is often unpredictable, so personalized therapies with drug prescriptions tailored to individual cases are required.

Problematic recurrent tumors of the stomach are treated with therapeutic antibodies. They block the receptors on the surface of cells that are responsible for receiving growth-promoting signals. Without them, cell division stops and the tumor does not increase in size. Preventing the growth of blood vessels is particularly important, because they supply nutrients and oxygen to the tumor. Ramucirumab is a therapeutic antibody used to disrupt the growth of blood vessels in tumor tissue. The efficacy of this drug varies widely from patient to patient.

MIPT bioinformaticians and their colleagues from medical research centers and the industry have proposed that a patient's data on the gene expression levels in cancer be used to evaluate ramucirumab efficacy in each individual case.

"This is virtually the first published case of successful [ramucirumab] prescription to patients with gastric cancer, which was not random but rather informed by the analysis of the molecular markers we track based on RNA sequencing," said Maxim Sorokin, a senior researcher at the MIPT Laboratory for Translational Genomic Bioinformatics and the head of the Bioinformatics Department at Oncobox.

Combined with information technology, modern molecular biology methods enable researchers to collect qualitative data on the expression of every gene in a cell. By analyzing these data, it is possible to find the

key to diagnosing oncological diseases and predicting the efficacy of their treatment.

More information: Maxim Sorokin et al. RNA sequencing profiles and diagnostic signatures linked with response to ramucirumab in gastric cancer, *Molecular Case Studies* (2020). DOI: 10.1101/mcs.a004945

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