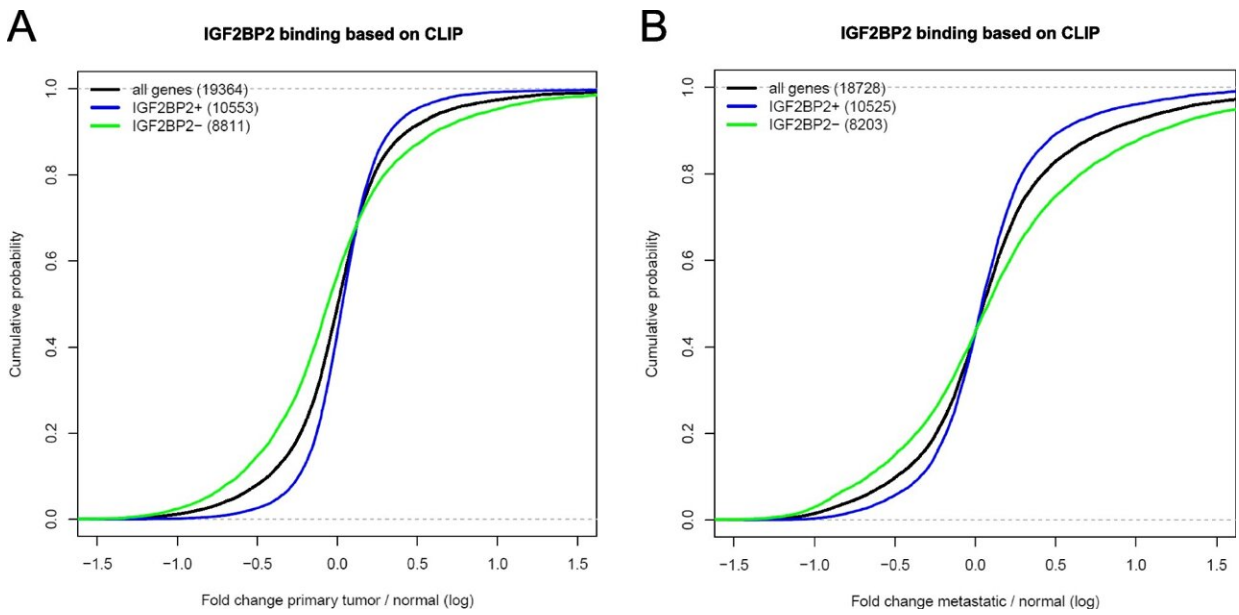
Researchers find possible cause for chemoresistance in bowel cancer

June 15 2023



Analysis of IGF2BP2 targets in tumor and metastatic CRC tissues. A, B Cumulative plot of gene expression (log2 fold change) in primary (A) and metastatic (B) CRC tissues compared to their respective control tissues. Gene subgroups were built according to IGF2BP2 binding determined by IGF2BP2 CLIP data (see Methods) and representing all genes (black), IGF2BP2 positive genes (IGF2BP2+ ,blue) and IGF2BP2 negative genes (IGF2BP2-,green). Numbers in brackets denote the number of genes in each category. Credit: *Molecular Cancer* (2023). DOI: 10.1186/s12943-023-01787-x

Large quantities of the protein IGF2BP2 not only make bowel cancer

grow faster, they also make it resistant to common forms of chemotherapy. This discovery was made by a research team led by Martin Luther University Halle-Wittenberg (MLU) in cooperation with Saarland University.

For the new study, published in the journal *Molecular Cancer*, the team analyzed more than 140 tissue samples from bowel cancer patients and found there was a link between the concentration of IGF2BP2 and the characteristics of the tumors. The findings could help to develop better diagnostic procedures and possibly new forms of therapy in the future.

According to the Robert Koch Institute, bowel cancer is one of the most common cancers in Germany. In 2019, 58,967 men and women were diagnosed with it. "If caught early, bowel cancer can be removed quite well by surgery and it is therefore often curable," says the leader of the study, Professor Sonja Kessler from the Institute of Pharmacy at MLU.

Once the disease has progressed, surgery is often no longer an option. In some cases, tumors can develop resistance to common forms of chemotherapy, which means they no longer respond to treatment. "We still do not know how and why some tumors develop this resistance. Currently, there are no reliable tests that can predict this at an early stage," Kessler adds.

For the new study, the team led by the pharmacist from MLU examined more than 140 tissue samples from patients suffering from bowel cancer . The aim was to find distinctive traits in the samples which do not occur in healthy individuals and which could possibly explain the different tumor characteristics. The scientists found what they were looking for in the protein IGF2BP2.

"It is actually a growth protein that is predominantly active during embryonic development. However, it is also found in the intestinal tissue

of adults," explains pharmacist and first author of the study, Sandra Kendzia, from MLU. The protein is also known to influence cell growth and metabolism. With the help of extensive experiments on cell cultures and in mice, the team has now been able to show that there is a link between the concentration of the protein and the characteristics of the tumor; a high level of IGF2BP2 leads to faster growth and a resistance to common chemotherapy drugs.

According to Kessler, these findings are highly relevant for medicine and could be applied in two ways. "One could develop a biomarker, that means a test to determine the characteristics of the tumor at an early stage and to align treatment accordingly," says the pharmacist. Another application would be to develop active substances that specifically inhibit the activity of IGF2BP2 in tumors and thus might be able to reverse resistance to chemotherapy drugs.

"Further research needs to be conducted to confirm whether this is indeed possible. We still don't know enough about how IGF2BP2 precisely intervenes in the metabolism of cancer cells," Kessler concludes. Only after these questions have been answered, large-scale clinical trials could determine and verify the efficacy of potential active substances in humans.

More information: Sandra Kendzia et al, A combined computational and functional approach identifies IGF2BP2 as a driver of chemoresistance in a wide array of pre-clinical models of colorectal cancer, *Molecular Cancer* (2023). DOI: 10.1186/s12943-023-01787-x

Provided by Martin-Luther-Universität Halle-Wittenberg

Citation: Researchers find possible cause for chemoresistance in bowel cancer (2023, June 15)

retrieved 22 May 2024 from https://medicalxpress.com/news/2023-06-chemoresistance-bowel-cancer.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.