CELLPHENOMICS

CELLphenomics GmbH Robert-Rössle-Str. 10. 13125 Berlin

CELLphenomics GmbH

Public Relations
Robert-Rössle-Str. 10
13125 Berlin
+49 30 94894423
melanie.alperstaedt@cellphenomics.com

PRESS RELEASE

RELEASE DATE: 6-23-2023

Bowel cancer: Researchers find possible cause for chemoresistance and partially used patient-derived 3D cell culture models for their studies.

(Berlin, Germany) – Large quantities of the protein IGF2BP2 not only make bowel cancer grow faster, but 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) and Saarland University with the collaboration of CELLphenomics. For its new study, published in the scientific journal "Molecular Cancer", the team analysed more than 140 tissue samples from bowel cancer patients from the IMI project OncoTrack, from which CELLphenomics emerged as a spin-off. The researchers found a link between the concentration of IGF2BP2 and the characteristics of the tumours. The findings could help to develop better diagnostic procedures and possibly novel therapies 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, tumours 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 tumours 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. Among other things, they used the patient- derived 3D cell culture models established by Dr. Regenbrecht and his group at the Charité, whose technology now forms the basis of CELLphenomics. The aim was to find distinctive traits in the samples which do not occur in healthy individuals,

and which could possibly explain the different tumour 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 tumour; 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 tumour 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 tumours 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.

This research was conducted as part of the EU-funded OncoTrack project and funded by the Wilhelm Sander Foundation.

Study: Kendzia S. 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