Biomarker predicts response to cancer treatment

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VIB researcher Diether Lambrechts, associated with KU Leuven, has discovered a biomarker that might potentially predict which patients will benefit more from treatment with bevacizumab (Avastin). If validated, this discovery could be an important step towards personalized medicine and patient-tailored use of this important cancer drug.

Diether Lambrechts (VIB – KU Leuven) said "in two large clinical studies with patients with advanced stages of pancreas and kidney cancer a variant in the DNA was discovered that identified patients who did not respond well to the prescribed course of bevacizumab. Further research in the lab showed that this variant, or biomarker, was responsible for increasing the production of a certain protein that is hypothesized to neutralize the effect of bevacizumab in these patients. If this marker would be clinically validated, the marker could be used to distinguish patients that would benefit from the drug from those that would not, and spare them a futile therapy with possible side effects."

Biomarkers for targeted treatments

Oncologists want to use treatments that target the particular cancer. Every cancer is characterized by a specific set of proteins that is responsible for the abnormal behavior of the tumor. Therapies aimed at blocking these proteins can significantly extend the life of cancer patients, provided that they receive the drug that is right for them. Cancers with a different set of proteins will not respond to a therapy that

does not target those proteins. That is why developing biomarkers for all targeted therapies is so important.

An antibody as cancer drug

Eric Van Cutsem (UZ Leuven) explains that "Bevacizumab is a targeted therapy but there is no clinically validated biomarker yet. In clinical practice, patients in the advanced stages of colon, renal, lung and breast cancer are already being given bevacizumab in addition to their conventional (chemo)therapy. The monoclonal antibody bevacizumab neutralizes the wild growth of blood vessels triggered by the tumor in support of its aggressive growth. Currently studies are under way to determine whether bevacizumab could also be used for other cancers."

DNA variants

Diether Lambrechts and Bart Claes (VIB/KU Leuven) looked at blood samples from cancer patients participating in 2 clinical studies and receiving bevacizumab or a placebo in addition to standard treatment. They subsequently looked for genetic variations in the DNA that could predict specifically how long patients survived in the group treated with bevacizumab but not in the placebo group. This is how they came upon a variant that showed predictive value for treatment with bevacizumab. These findings are a nice result of all efforts being done to identify a biomarker for bevacizumab.

More research necessary

The results of this study are well advanced but not final. Additional studies are needed to further validate the findings scientifically. However, it is a promising start for the personalized use of this drug. And it should be noted here that biomarkers like these do not only

benefit patients but, given the high price of new cancer drugs, will help keep healthcare affordable.

More information: VEGF pathway genetic variants as biomarkers of treatment outcome with bevacizumab: an analysis of data from the AViTA and AVOREN randomised trials Diether Lambrechts et al. *The Lancet Oncology*, doi:10.1016/S1470-2045(12)70231-0

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