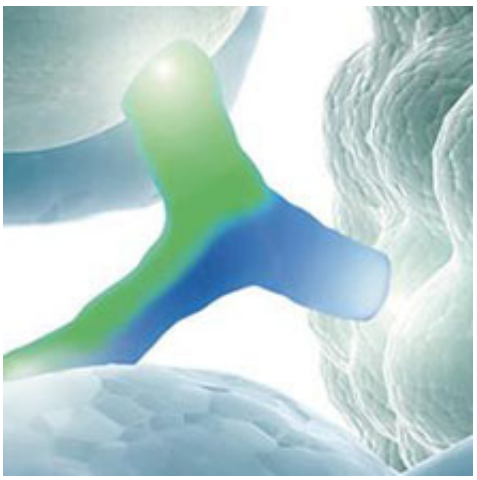
Subcutaneous administration of multispecific antibody makes tumor treatment faster and more tolerable

July 1 2015



Trifunctional antibody, Credit: Trion Research GmbH

Tumor treatment with multispecific antibodies is significantly more tolerable if administered subcutaneously rather than via the bloodstream, which was the standard procedure until now. This was the result of an animal model study undertaken by researchers at Helmholtz Zentrum München in cooperation with the Munich biotech company Trion Research. According to the scientists, the findings published in the journal *Molecular Cancer Therapeutics* could lead to shorter hospital stays, among other benefits for patients.

As a rule, anti-tumor antibodies are administered to the patients intravenously. This usually takes several hours because otherwise a too rapid activation of the immune system can lead to significant adverse side effects. The research group led by Prof. Dr. Ralph Mocikat of the Institute of Molecular Immunology (IMI), Helmholtz Zentrum München, therefore tested the subcutaneous delivery of the antibodies. For this purpose, the scientists used a special class of multispecific, so-called trifunctional, antibodies. Specifically, they tested an antibody that was developed by Trion Research GmbH to combat melanoma cells.

Evenly released into the body

"Overall, our results from the mouse model show that the subcutaneous administration of trifunctional antibodies has significant advantages in comparison to the standard intravenous therapy," said lead author Nina Deppisch. "Although the bioavailability is lower – that is, the quantity of active agents in the bloodstream is less – the antibodies are better tolerated, with undiminished effectiveness against the tumor." The researchers hypothesize that this good tolerability is due to the subcutaneous method of administering the antibodies because these are slowly and evenly released into the body from under the skin, like from a depot. "Inflammation markers such as the levels of certain cytokines confirm this," Deppisch said.

Treatment in the future: subcutaneous rather than intravenous?

The researchers view two aspects as particularly promising: "First, the study once again demonstrates the effectiveness of trifunctional antibodies," said Mocikat. "Their advantage is that they generally bring about long-lasting immunity against the tumor instead of fighting it only for a brief period. Second, our results show that tumor treatment can be

put on a broader basis with regards to its availability for patients. Perhaps, due to this better tolerability, a hospitalization of the patient will no longer be necessary, since the subcutaneous administration can take place in a matter of minutes instead of hours." The researchers want to explore this issue in further studies.

More information: "Efficacy and Tolerability of a GD2-Directed Trifunctional Bispecific Antibody in a Preclinical Model: Subcutaneous administration is superior to intravenous delivery." *Mol Cancer Ther*. 2015 Jun 10. www.ncbi.nlm.nih.gov/pubmed/26063765

Provided by Helmholtz Association of German Research Centres