

Tiny antibody fragments raised in camels find drug targets in human breast cancer cells

April 11 2011

A new discovery published online in The FASEB Journal promises to help physicians identify patients most likely to benefit from breast cancer drug therapies. If the compound, called "Nanobody," proves effective in clinical trials, it would represent a significant advance for breast cancer drug therapy because some drugs are effective only in some people. In addition, some drugs have side effects that may cause damage to vital organs, making it more crucial for physicians to get the right treatment to the right patient the first time around.

"What makes Nanobodies so promising is that they are robust, small enough for rapid elimination from the body, and easy to produce at a relatively low cost," said Ilse Vaneycken, M.Sc., a researcher involved in the work.

To make this discovery, Vaneycken and her colleagues started with the target of the [therapeutic drugs](#) (HER2) and immunized a dromedary camel to raise special [antibodies](#) unique to this species. Next, all unnecessary parts of the camel's antibodies were removed and cloned in [bacteria](#). Of 100 million bacterial clones, the team selected those that produced the 40 Nanobodies that recognized— or bound to—the same site targeted by therapeutic drugs. Of this group, the team screened for compounds that picked out [breast cancer](#) cells bearing the genetic tag HER2. Their lead compound did just that, and without blocking access to cancer-killing drugs now in use. Other properties of Nanobodies, such

as good expression, stability, and visibility—enabled breast cancer tumors to be stained and seen rapidly—were also exploited.

"The scientists went over the hump to get to the lump so to speak," said Gerald Weissmann, M.D., Editor-in-Chief of The [FASEB Journal](#). "This technique not only promises to help doctors target cancer cells with effective drugs today, but to pick out other discrete cancer targets in the future."

More information: Ilse Vaneycken, Nick Devoogdt, Naomi Van Gassen, Cécile Vincke, Catarina Xavier, Ulrich Wernery, Serge Muyldermans, Tony Lahoutte, and Vicky Caveliers. Preclinical screening of anti-HER2 nanobodies for molecular imaging of breast cancer. *FASEB J.* [doi:10.1096/fj.10-180331](https://doi.org/10.1096/fj.10-180331)

Provided by Federation of American Societies for Experimental Biology

Citation: Tiny antibody fragments raised in camels find drug targets in human breast cancer cells (2011, April 11) retrieved 23 April 2024 from <https://medicalxpress.com/news/2011-04-tiny-antibody-fragments-camels-drug.html>

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