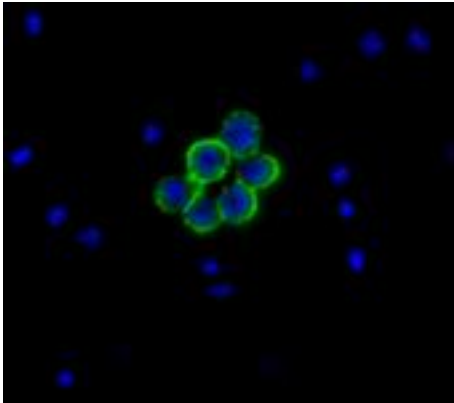


Tailoring the Therapy to the Cancer

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Category: [Health & Medicine](#)

Press release from: [Austrian Science Fund FWF](#)



A single receptor molecule can perform different functions in different cancer types, thereby complicating approaches to therapy. This was the key finding of a study recently published in the *British Journal of Cancer* (BJC)*. The study compared the functionality of the HER2/neu receptor in the cancer cells of breast and ovarian cancer tissue. Supported by the Austrian Science Fund FWF, the team of scientists involved have shown that the cellular process regulated by this receptor vary greatly between different cancer types. As HER2/neu is the target of successful breast cancer therapy, this result is of major significance for the treatment of ovarian cancer.

Breast and ovarian cancers can both be hereditary, can both be traced back to the same genetic defect and consequently can both possess a large number of HER2/neu receptors. Why therefore do both cancer types not react in the same way when this receptor is blocked? An approach that has proved to be the biggest success of the past 20 years in the treatment of breast cancer has proved unsuccessful in therapies for ovarian cancer. Dr. Dietmar Pils, a member of the laboratory headed by Prof. Michael Krainer, an oncologist at the Department of Internal Medicine I, Medical University of Vienna, has achieved a major breakthrough in finding an answer to this puzzling question.

One Receptor. Two Effects.

The team compared tissue samples from 148 ovarian cancers with results from breast cancer tissue samples and the available patient data. This comparison uncovered interesting differences between the two tissue types. While around 25% of ovarian cancer samples also exhibited a high occurrence of the HER2/neu receptor (a known fact), a different signal molecule (CXCR4) was unaffected in the ovarian cancer tissue. However, breast cancer cells, which exhibit elevated levels of HER2/neu, also produce greater amounts of CXCR4 than healthy cells. The CXCR4 molecule has been linked to the formation of metastases and it is assumed that HER2/neu induces the formation of CXCR4 while simultaneously protecting the molecule against degradation caused by enzymes, thus enabling the cancer to become more aggressive (i.e. metastasising). The results from the Medical University of Vienna now show that the signalling effect produced by HER2/neu is not involved in ovarian cancer.

Molecular Diagnostics Optimise Therapy

Prof. Krainer on the significance of these results: "For almost ten years we have been able to identify hereditary breast cancer using molecular diagnostics and rely on monoclonal antibodies for therapy. The first antibody to be approved for use as a medicine blocks precisely the HER2/neu receptor, thus impeding the cancer's growth. This is a perfect example of a tailor-made approach to therapy. Our work now reveals just how important it is to carry this differentiation further forward in the development of cancer therapies. After all, in the case of ovarian cancer cells, although the same monoclonal antibody fits this receptor, it has little effect. My laboratory is using findings such as these to create a basis for optimizing the treatment of cancer and to discover where therapies are going wrong. We are very grateful for the support we have received from the FWF,

particularly since the potential – including the financial potential – that fundamental research offers for the health system seems not to have been fully recognized yet."

This study, supported by the FWF Austrian Science Fund, clearly demonstrates just how important results from fundamental research can be for state-of-the-art cancer therapy. Furthermore, studies such as this also enable health professionals to choose the optimum treatment for each individual patient from a vast range of therapies. After all, there is no one-size-fits-all treatment for cancer.

Image and text will be available online from Friday, 26th January 2007, 09.00 a.m. CET onwards:

www.fwf.ac.at/en/public_relations/press/pv200701-2en.html

*Original publication:

In ovarian cancer the prognostic influence of HER2/neu is not dependent on the CXCR4/SDF-1 signalling pathway. D Pils, A Pinter, J Reibenwein, A Alfan, P Horak, B C Schmid, L Hefler, R Horvat, A Reinthaller, R Zeillinger & M Krainer. British Journal of Cancer, doi:10.1038/sj.bjc.6603581

Currently available to purchase as a download at: www.nature.com/bjc/journal/vaop/ncurrent/index.html (edition dated 23 January 2006)

Vienna, 26th January 2007

The FWF (Austrian Science Fund) is Austria's central organization for the funding of basic research.

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