

Novel therapy to treat patients with hereditary breast cancer and ovarian cancer

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European scientists recently discovered a novel therapy to treat a subgroup of patients with hereditary breast/ovarian cancer. Both the EU and the US have approved an accelerated procedure to market this promising new treatment with few side effects. On the web portal HorizonHealth.eu, the researchers reveal that they have now also developed a special technique to keep tumour tissue alive outside the human body. They can use this to identify patients that are likely to respond to the new therapy. The first results suggest that more than a thousand patients in the Netherlands alone may benefit from the new treatment every year.

DNA damage repair

Most patients with hereditary breast cancer have so-called BRCA1 or BRCA2 mutations. These strongly increase their risk of [breast cancer](#) and [ovarian cancer](#). However, the mutations are also the weakness of the tumour cells. The novel treatment cleverly exploits this weakness to kill [cancer cells](#) and leave [healthy cells](#) unharmed.

"We think DNA is the key to providing better anti-cancer therapies", says Roland Kanaar, one of the scientific coordinators of the collaborative project DDResponse. This consortium, which was funded by the European Commission, combines scientific, medical and pharmaceutical expertise to deliver fundamental knowledge about DNA damage repair and its clinical application.

Few side effects

Years of international scientific research have resulted in insight into the function of BRCA proteins in a healthy [human body](#). BRCA proteins are involved in repairing breaks in the DNA double helix. Such breaks may cause cell death when left unrepaired. Healthy cells have two methods of repairing these breaks. "Tumours with a BRCA defect have lost one of these methods, leaving them with only one", explains research coordinator Dik van Gent. "We have unravelled how certain molecules inhibit the remaining repair process, causing the [tumour cells](#) to die. Healthy cells survive the treatment because they still have one active DNA repair mechanism left. As a result, the therapy has few [side effects](#)."

Personalised medicine

After unravelling the molecular mechanism of the treatment, researchers at Erasmus MC (Rotterdam, the Netherlands) and LUMC (Leiden, the Netherlands) developed a technique to identify patients that may benefit from the treatment. The new technique enables scientists to keep a biopsy from the tumour alive outside the patient's body. As a result, it is possible to test the treatment on the patient's own tissue. This effectivity test is an important step towards personalised medicine, tailoring treatments to the individual patient.

Future

The next challenge is to make the effectivity test available to all breast and ovarian cancer patients. Scientific coordinator Jan Hoeijmakers: "Scientists in the Dutch cities of Rotterdam, Leiden, Amsterdam and Groningen have now received funding from Alpe d'Huizes, allowing us to search for possibilities to extend the application of the test. This

breakthrough is a major reward for the many researchers who contributed to finding the Achilles' heel of this type of cancer over the past few years. In the long term, we expect this treatment to also benefit patients with other types of cancer involving a similar DNA repair defect."

Provided by HorizonHealth

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