Identifying the drivers of breast cancer

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Credit: AI-generated image (disclaimer)

Information on what causes breast cancer is sorely lacking, making early detection crucial. The sooner breast cancer is found, the greater the chance of treatment and cure.

But the situation becomes more complicated when patients are diagnosed with specific subtypes of breast cancer - invasive lobular carcinoma (ILC) and triple negative (TN) breast cancer - because there

is no available treatment. ILC accounts for 10 percent of breast cancer worldwide, and TN for 15 percent.

The EU-funded RATHER ('Rational therapy for breast cancer: individualised treatment for difficult-to-treat breast cancer subtypes') project is determined to identify and validate new kinase targets to treat both subtypes.

Backed with almost EUR 6 million in funding under the Health theme of the Seventh Framework Programme (FP7), the RATHER partners have put the subset of human proteins known as kinases under the microscope. Kinases play a key role in regulating how cells function. Past studies have suggested a link between cancer and changes to one or more of the 500 human kinases.

The consortium is investigating the kinase alternations specific to the two cancer types. ILC surfaces within the milk-producing lobules of the breast. TN, meanwhile, is characterised by a lack of oestrogen, progesterone and HER2 receptors.

The team got the ball rolling in 2011 by investigating 300 clinical samples from150 patients diagnosed with ILC and 150 with TN. The researchers wanted to see whether the data would help them determine the key differences between normal and diseased breast tissue. 'Our hope is that some of these differences/alterations will prove to be drivers of disease,' says the team, 'meaning that they are involved in causing the disease, as opposed to being random side-effects of the condition.' Because driver alterations represent promising therapeutic targets, it is important to identify them.

As the changes that take place within the breast cancer subtypes can vary, the partners are also developing molecular diagnostic tests. These will allow doctors to select the best treatment option for patients.

When the team finds the promising kinase alterations and their corresponding kinase inhibitors, they will begin clinical trials to assess patient responses to the drugs. The molecular diagnostic tests will be used to determine which patients participate in the trial. This is to ensure the project involves the patients who will benefit most from the drugs.

The RATHER consortium is headed by University College Dublin, National University of Ireland, which is joined by research institutes, universities and companies from Spain, France, Ireland, the Netherlands, Sweden and the UK.

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