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New blood test predicts breast cancer relapse

Scientists at the ICR and The Royal Marsden have developed a blood test to identify women who will suffer a relapse of breast cancer following treatment, months before tumours are visible on hospital scans

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7.9

months ? the average time before any visible signs emerged that cancer was detected in the bloodstream

By detecting cancer DNA in the bloodstream, the test can uncover small numbers of residual cancer cells that have resisted therapy. Researchers were able to track key mutations that cancer accumulates as it develops and spreads, without the need for invasive biopsy procedures.

The study, published in Science Translational Medicine, is an important step towards the use of liquid biopsies to revolutionise breast cancer care by identifying the particular mutations that are likely to prove lethal to that patient and tailoring treatment accordingly.

The research received funding from organisations including the NIHR BRC at The Royal Marsden and the ICR, Breast Cancer Now and Cancer Research UK.

By monitoring blood samples from 55 women with breast cancer who had been treated with chemotherapy and surgery, the researchers could accurately predict who would later suffer a relapse. Women who tested positive for circulating tumour DNA were 12 times more likely to relapse than those who tested negative, and cancer was detected an average of 7.9 months before any visible signs emerged.

The researchers used mutation tracking ? a digital polymerase chain reaction (PCR) test personalised to the mutations in an individual?s cancer ? to identify tumour DNA. As they were looking for mutations common to many types of breast cancers, they found that the test could be applied to all breast cancer subtypes.

The research also showed how genetic mutations build up in the cancer as it develops. This reinforces the importance of detecting recurrence early so that patients can have treatment before the extra mutations emerge and make the disease harder to treat.

Study leader Dr Nicholas Turner [6], Team Leader in Molecular Oncology at the ICR and Consultant Medical Oncologist at The Royal Marsden, said: ?This is the first study to show that these blood tests could be used to predict relapse. It will be some years before the test could potentially be available in hospitals, but we hope to bring this date closer by conducting much larger clinical trials starting next year.?

12

times greater risk of relapse for women who tested positive for circulating tumour DNA than those who tested negative

?There are still challenges in implementing this technology, but digital PCR is relatively cost-effective and the information that it provide could make a real difference.?

Further reading

Mutation tracking in circulating tumour DNA predicts relapse in early breast cancer [7]

[1] https://www.cancerbrc.org/advance

[2] https://twitter.com/intent/tweet?url=https%3A%2F%2Fwww.cancerbrc.org%2Fprintpdf%2F231

[3] https://www.facebook.com/sharer/sharer.php?u=https%3A%2F%2Fwww.cancerbrc.org%2Fprintpdf%2F231

[4] http://www.linkedin.com/shareArticle?mini=true&url=https%3A%2F%2Fwww.cancerbrc.org%2Fprintpdf%2F231

[5] https://plus.google.com/share?url=https%3A%2F%2Fwww.cancerbrc.org%2Fprintpdf%2F231

[6] https://www.cancerbrc.org/our-research/our-research-leaders/dr-nicholas-turner

[7] http://stm.sciencemag.org/content/7/302/302ra133