



Wandering breast cancer cells can stay dormant for decades

A provocative new theory that breast cancer cells can self-seed by wandering off round the body and returning to the primary tumour, or can stay in the body for several decades after the disease appeared to be cured before growing or seeding in other organs, could pave the way for new therapies to destroy these wandering cells that have escaped initial treatment.

Breast cancer specialist Dr Larry Norton*, from the Memorial Sloan-Kettering Cancer Center (MSKCC) in New York City, likened the spread of breast cancer cells in the body to a garden gradually overrun by weeds, in a presentation at the annual conference of the National Cancer Research Institute (NCRI) in Birmingham yesterday (Sunday).

The proposition that cancer is not only a disease of mitosis - the splitting of cancer cells into multiple cells but also of self-seeding - is already stimulating international discussion.

Dr Norton's colleague, Dr. Joan Massague, has a theory that a small subset of cancer cells is able to initiate new tumours either at the primary site or in other parts of the body.

"Wandering cells might relocate to the primary site just as they might - by using the same biological toolbox - locate to a distant site," said Dr Norton. "Just as a weed bed overgrows and destroys a garden and then scatters its tiny seeds to invade neighbouring gardens."

Dr Norton's team has discovered a genetic function that allows breast cancer cells to spread to the bone and survive for years after treatment has been given to the patient.

The cells that infiltrate the bone can survive if they are stimulated by a gene called Src.

If Src is turned off in the cells, they can no longer survive and then fail to spread.

Dr Norton, a medical oncologist, said: "Our results should encourage cancer specialists to think about further study of Src inhibitor drugs that attack reservoirs of these 'wandering' latent cancer cells and prevent spread of the disease in breast cancer patients after the tumour has been removed."

According to the MSKCC team, nearly one third of oestrogen receptor positive breast cancer cases relapse three or more years after diagnosis, with some cancers developing decades later. This suggests that latent cancer cells appear to be partially resistant to conventional treatment. They showed that latency is due to Src, which is active in 90 percent of oestrogen receptor positive cases.

Professor Jack Cuzick, Cancer Research UK epidemiologist, said: "One of the conundrums that characterises breast cancer - and only breast cancer - is late recurrence. The reasons for this are unclear but Dr Norton makes a provocative proposal. There are several other mechanisms that could explain this late recurrence."

Professor Robert Coleman, chairman of the NCRI breast cancer group, said: "Dr Norton challenges our assumptions about the process of metastasis and presents a compelling theory.

"This resonates with some of the recent trials suggesting that treatments influencing the bone marrow microenvironment can reduce metastasis at multiple sites. Co-operation between cancer cells, haematopoietic stem cells and other stromal cells appears to be critical for metastasis, especially in tumours with the propensity for dormancy leading to late recurrence."

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For media enquiries call Sally Staples in the NCRI press office on 07918 691747, or the out of hours' duty press officer on 07050 264 059

To read abstract visit: http://www.ncri.org.uk/ncriconference/programme/speakerAbstracts/2009Plen_Larry_Norton.asp

***Dr Larry Norton is Deputy Physician-in-Chief for Breast Cancer Programs and the medical director of the Evelyn H. Lauder Breast Center at Memorial Sloan-Kettering Cancer Center (MSKCC).**

He is also the principal investigator of a Program Project Grant from the National Cancer Institute that is aimed at better understanding breast cancer in the laboratory and in bringing these advances into clinical practice.

About the NCRI Cancer Conference

The National Cancer Research Institute (NCRI) Cancer Conference is the UK's major forum for showcasing the best British and international cancer research. The Conference offers unique opportunities for networking and sharing knowledge by bringing together world leading experts from all cancer research disciplines. The fifth annual NCRI Cancer Conference is taking place from the 4-7 October 2009 at the International Convention Centre in Birmingham.

For more information visit www.ncri.org.uk/ncriconference

About the NCRI

The National Cancer Research Institute (NCRI) was established in April 2001. It is a UK-wide partnership between the government, charity and industry which promotes co-operation in cancer research among the 21 member organisations for the benefit of patients, the public and the scientific community.

For more information visit www.ncri.org.uk

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