

Scientists discover how cancers generate muscle-like contractions to spread around the body

August 16 2011

Cancer Research UK-funded scientists have discovered that a protein called JAK triggers contractions in tumors which allows cancer cells to squeeze through tiny spaces and spread, in research published in [Cancer Cell](#) today.

The collaboration of scientists from The Institute of Cancer Research (ICR) in London together with scientists in France at [INSERM](#) and the University of Nice showed that when a [protein](#) called JAK becomes 'switched on' it leads to muscle-like [contractions](#) in cells to generate the force that [cancer cells](#) require to move.

The finding raises the possibility that drugs targeting JAK could potentially stop the spread of tumours, called metastasis, which is responsible for 90 per cent of cancer-related deaths.

Tumors consist of cancer cells, tumour-associated [healthy cells](#) and scaffolding that sticks everything together called the cell matrix. Cancer cells spread by moving from the tumour, through this matrix, to new locations.

In some cancer types the cancer cells use force to 'elbow' their way through the matrix. The force is produced by a process similar to muscle contraction. In other types of tumours the tumor-associated healthy cells use force to create tunnels down which the [tumor](#) cells move.

The scientists showed that same processes are used to generate force in cancer cells and in the tumor associated normal cells.

Lead author Professor Chris Marshall, a Cancer Research UK-funded scientist from The Institute of Cancer Research, said: “There’s an urgent need to understand how tumors can spread from their site of origin, for example the skin, to other tissues, such as the lungs, liver and bone where the disease becomes more difficult to treat successfully.

“We’ve shown that the same protein called JAK triggers tumour spread via two different routes – it generates the force needed for cancer cells to move around the body and also for triggers healthy cells in tumours to create furrows in tissues down which cancer cells move.

“Encouragingly drugs that block JAK are already in development to stop the growth of tumours. Our new study suggests that such drugs may also stop the spread of cancer.”

Dr. Lesley Walker, Cancer Research UK’s director of cancer information, said: “A huge challenge in successfully treating cancer is stopping it from spreading around the body, and keeping cancer that has already spread at bay. Most deaths from cancer are caused when cancer cells travel to different parts of the body and grow as secondary tumours.

“Discovering how cancer cells can funnel grooves though tissues, to squeeze away from primary tumours and spread to new sites, gives scientists fresh understanding of ways to stop cancer spread - literally in its tracks.”

Provided by Cancer Research UK

Citation: Scientists discover how cancers generate muscle-like contractions to spread around the

body (2011, August 16) retrieved 27 April 2024 from
<https://medicalxpress.com/news/2011-08-scientists-cancers-muscle-like-body.html>

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