MedicalXpress

Scientists find molecular 'breadcrumb trail' that helps melanoma spread

October 14 2014

Cancer Research UK scientists have discovered that melanoma cells are drawn to follow the 'trail' of a naturally-occurring molecule in the body, which directs this serious type of skin cancer to spread, according to research publishing Tuesday in the open access journal *PLOS Biology*.

The team at the Cancer Research UK Beatson Institute at the University of Glasgow, revealed that melanoma cells give themselves the 'green light' to move using the molecule - a type of fatty chemical called lysophosphatidic acid (LPA). This signal prompts them to travel and spread in the body.

The researchers showed in cancer cell lines and mice that tumour cells start their journey by first breaking down a nearby source of LPA molecules. Once nearby levels of LPA are depleted, the cells then move out of the tumour in search of more. This creates a trail leading to the bloodstream and onto a new site in the body.

Unlike other cancers, where cells stick tightly to their neighbours, the structure of melanoma cells means they are primed to spread from the start. So as soon as they have taken the directions given by LPA they start moving. This means the cancer can be difficult to treat because it spreads quickly and aggressively.

The researchers filmed the cells and found that they move at speed, spreading around the body at a pace of a millimetre per day. This speed means a cell can arrive anywhere in the body within a few weeks.

Lead author, Professor Robert Insall, Cancer Research UK scientist at the Beatson Institute for Cancer Research at the University of Glasgow, said: "Our exciting findings show that skin cancer cells create their own 'green light' signal to start spreading, and are lured to travel around the body by a trail of these fatty molecules.

"The next step will be to find how the melanoma cells break down the LPA molecules to see if this sparks ideas for new ways to stop the cancer from spreading. At the moment our research is still in early stages but we hope this could help doctors to make sure this cancer doesn't spread."

The rates of people diagnosed with melanoma are five times higher than 40 years ago. Over 13,000 people are diagnosed with melanoma every year in the UK. Each year, around 2,200 people die from the disease.

Professor Nic Jones, Cancer Research UK's chief scientist, said: "Sadly there are few options available for patients whose melanoma has spread, which is especially concerning as this type of cancer has risen rapidly since the 70s.

"Research like this is crucial to find effective ways to limit the spread of tumours and increase the chances for more successful treatment of this horrible disease.

"We can all also reduce our risk of the disease by keeping safe in the sun. When the sun is strong it's best to cover up with clothes and spend time in the shade to protect your skin from sunburn and reduce your risk of skin cancer."

More information: *PLoS Biol* 12(10): e1001966. DOI: 10.1371/journal.pbio.1001966