Protein prompting cells to sprout legs could cause skin cancer to spread

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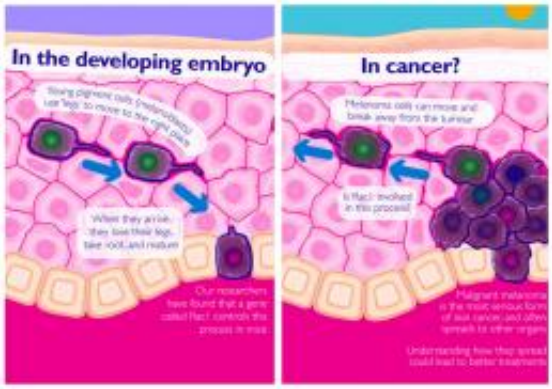

Cancer Research UK scientists have discovered that a protein called Rac1 prompts pigment cells to sprout long 'legs' that could propel skin cancer cells, allowing them to spread, according to research published in Developmental Cell today.

The team from Cancer Research UK's Beatson Institute for Cancer Research at the University of Glasgow showed that when Rac1 is switched on in mice it signals healthy pigment cells, called melanoblasts, to grow legs and 'travel' during their early development. When Rac1 was 'switched off' the cells were only able to sprout short buds and had difficulty moving.

Melanoblast cells mature to develop into melanocytes - pigment-producing cells that define skin and hair colour. Melanocytes can form moles, or naevi, and if they contain genetic faults these cells can develop into melanomas - the most dangerous form of skin cancer.

Immature melanoblasts move through the developing skin layers of an embryo to find the correct place to settle and grow. Once they have matured and anchored in position, they no longer travel.

But cancer cells sometimes mimic the characteristics of immature embryonic cells such as melanoblasts and 're-learn' forgotten skills - such as the ability to move. Studying these immature cells helps scientists understand how cancer develops and spreads.

Lead author, Professor Laura Machesky at Cancer Research UK's Beatson Institute, said: "We've discovered that a protein called Rac1 triggers the growth of long 'legs' which can propel cells during the early stages of skin development.

"But once cells have matured these 'shape-shifting' abilities are lost.

"Our study reveals fresh understanding of how melanoma cells could re-learn forgotten skills, such as being able to change shape, and use these abilities to break away from a tumor and move around the body."

There are around 11,770 new cases of malignant melanoma diagnosed each year in the UK and it is mainly caused by over exposure to UV light. Almost one third of all cases of malignant melanoma occur in people under 55.

Dr. Lesley Walker, Cancer Research UK's director of cancer information, said: "Our scientists are carrying out pioneering work to understand the biology of skin cancer and to find new and better ways to treat the disease.

"Melanoma can be successfully treated if caught early, but can be deadly if it spreads to new areas.

"It's critical to understand how this happens so we can develop drugs to block this process."

More information: Rac1 drives melanoblast organization during mouse development by orchestrating pseudopod-driven motility and cell cycle progression. Li et al. *Developmental Cell.*

Provided by Cancer Research UK