

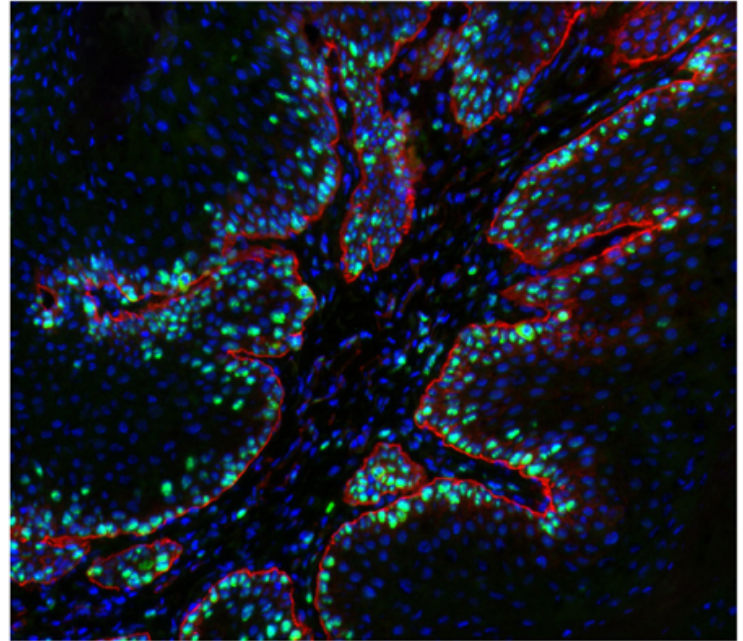
Cancer: a disease of stem cells?

What do we know?

Mutations in genes controlling cell division can cause healthy cells to become cancer cells. But it's still not clear how cancer cells grow into a tumour.

Only some cells in tumours continue to divide and multiply. This observation has led to two theories for how tumours grow. The 'cancer stem cell model' proposes that cancer stem cells make all other cells found in a tumour. Some tumour cells may briefly divide, but only cancer stem cells can make new cells indefinitely.

The 'stochastic model' suggests that many cells in a tumour replicate, differentiate and contribute equally to tumour growth.



Benign tumour in mouse skin; green and red mark proteins in the tumour that are normally found in two different skin cell types. Image: Cedric Blanpain, Université Libre de Bruxelles

What are researchers investigating?

There are many unknowns about cancer stem cells, including whether they even exist in all types of cancer.

There is no definitive proof for one theory or the other yet and it is possible that different types of cancer may follow different theories. Researchers are looking for more direct evidence that cancer stem cells are present in tumours.

Researchers are trying to determine which cells become cancer cells. Can any cell become a cancer stem cell or do cancer stem cells come only from mutating genes in natural stem cells?

What are the challenges?

Researchers want to know how different genes, mutations, signals and environments influence how cancer stem cells behave.

This is not easy, because studying cancer stem cells often requires isolating the cells in a laboratory, where they may behave differently than inside the body.