Cancer's growth driven by minority of cells within a tumour

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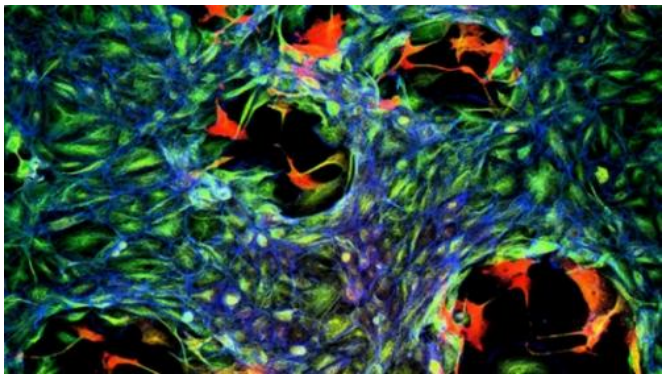

US cancer researchers have unearthed further evidence that a tumour's growth can be fuelled by just a small minority of its cells.

The work, carried out in mice, reveals new insights into how the disease develops and spreads, and offers new clues in the search for better treatments.

Commenting on the research, Cancer Research UK's Professor Charles Swanton, said it was a "fascinating glimpse into the dynamics driving the disease's growth."

"Evidence has been building for some time that tumours can be phenomenally complex, made up of many different types of cell.

"This elegant new study from US researchers shows how a small population of cells within a tumour – called a subclone – can release substances that fuel the entire cancer's growth and spread."

The researchers, from the Dana-Farber Cancer Institute in Boston, genetically manipulated lab-grown breast cancer cells to produce a range of different proteins previously found to be involved in cancer.

They then produced mixtures of cells where only a small minority produced one of these proteins.

"We wanted to explore the factors that allow these subgroups to coexist," said study leader Dr Kornelia Polyak.

When they transplanted the cells into mice, only certain mixtures were able to produce tumours that grew and spread – in particular, those where a minority of the cells produced either a molecule called IL-11 or one called CCL5.

By analysing the way different mixtures grew and spread, they were able to produce a series of mathematical equations, published in the journal *Nature*, describing how different subclones of cells evolve within tumours.

The findings come as part of a growing focus on understanding the diversity of cells within a tumour, something known as 'intratumour heterogeneity'.

"Understanding how the different populations of cells within a tumour cooperate to drive the disease's development is a phenomenon that's being intensely studied by researchers worldwide," said Swanton, whose team at Cancer Research UK's London Research Institute works on tumour heterogeneity.

Swanton is also co-ordinating TRACERx, a UK-wide lung cancer study that aims to map heterogeneity in lung cancer patients over the coming years.

"We hope that further studies, including the TRACERx lung cancer study, will help us get a handle on how to understand and target tumour diversity, and develop new strategies to effectively

treat patients with the disease in future," he added.

More information: Marusyk A, et al. (2014). "Non-cell-autonomous driving of tumour growth supports sub-clonal heterogeneity," *Nature*, DOI: 10.1038/nature13556

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