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Note on Cancer Cells Division Leading to the Formation of Tumours

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Opinion Article

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DESCRIPTION

Cancer cells divide indefinitely producing solid tumours or infiltrating the bloodstream with aberrant cells. Cell division is a natural process that the body uses to grow and repair itself. A parent cell splits into two daughter cells which are then employed to create new tissue or replace cells that have died due to ageing or disease. When there is no need for more daughter cells, healthy cells cease proliferating, whereas cancer cells continue to divide. They can also spread from one section of the body to another which is called metastasis. When the genes that control cell division are disrupted, cancer cells are produced. Carcinogenesis is triggered by mutation and epimutation of normal cells genetic material which disrupts the usual balance of cell proliferation and death. As a result, the body's cell division becomes uncontrolled. Cell proliferation that is uncontrolled and often rapid can result in benign or malignant tumours (cancer).

Benign tumours do not invade other tissues or spread to other parts of the body. Malignant tumours can infiltrate other organs spread to other parts of the body (metastasis) and cause death. Many different genes are being investigated as potential cancer treatments. The *p53* gene and the *PTEN* gene are two of the most investigated. These genes are important regulators of the cell cycle and other cellular and genomic integrity pathways. These genes stop the cell cycle ensuring that genetically injured cells do not pass on their harm to daughter cells. The cell cycle may be stopped and if the damage is severe enough, the *p53* and *PTEN* gene pathways may indicate cell death. Both the *p53* and *PTEN* genes are tumour suppressors because their pathways supervise the repair of cells

that may replicate out of control with damaged genetic material, eventually leading to cancer growth if not controlled. More than half of all human malignancies have mutations in these genes. Immune gene therapy is a type of cancer treatment in which the patient's immune cells and genes are modified to induce an anti-tumour response. Because the tumour cells are attacked by the body's own immune system, the immune system can naturally attack the cancer cells in the future if necessary. Bone marrow transplants, antibody treatments and different manipulations of host immune cells to target and destroy cancer cells are all examples of immunotherapies. Such biological alterations to target cancer cells include cellular receptors, antigens and cofactor molecules. We now have more information that leads to a fresh option and targeted therapy just when traditional chemotherapy was reaching its limits. The potential advantages to patients are so great that most big multinational pharmaceutical pipelines are overflowing with them with some promising ones now in phase III trials. The effectiveness of molecules works in focused therapy must be assessed differently. The benefit to patients is usually measured in terms of overall survival and symptom control rather than significant tumour decrease. In addition, compared to standard chemotherapy medicines, the therapeutic window can be substantially larger.

The survey shows how cancer cells intrinsic mechanisms alter the neutrophil compartment of the immune system and control their functional state influencing disease development. It is vital to remember that the aforementioned cancer cell-neutrophil interactions must be seen in the context of the greater intratumoral immune cell dynamics and interplay. Many diverse cancer cell intrinsic factors are at work at the same time affecting the wide range of immune cell (sub) types found in tumours necessitating the development of therapeutic techniques that address various aspects of cancer-immune cell cascades.