

Cancer Biology in Biology and Medicine

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Cancer is a genetic disease. It is caused by a number of changes (mutations) in the genes in our body that control cell growth or regulate the detection and repair of DNA damage. Often there is more than one gene involved in cancer development. Cancer is the result of accumulated mutations to a person's DNA.

To begin to understand Cancer of Unknown Primary (CUP) one needs to understand first a bit about how cancer starts, and that involves our cells: the human body is composed of billions of cells. Cells are the clever little building blocks that make up the organs and tissues of our bodies.

Our cells are genetically programmed to do various things throughout our lifetime. We need new cells to replace worn out cells that die in a regular cycle. If (the DNA in) a cell becomes faulty, cells can start growing uncontrollably and form a tumour – a 'swelling' but in the cancer context the word is used to denote abnormal growth of tissue.

If the tumour is abnormal it is known as 'malignant'; if it is not cancerous it is known as 'benign'. The word 'lesion' is sometimes used. Lesions are caused by any process that damages tissues. A cancerous tumour is an example of a lesion. A benign tumour does not spread within the body; but an untreated, malignant tumour is likely to spread (metastasis).

Early diagnosis is important. However, a tumour may not be apparent and the symptoms may not be recognised by the patient or the doctor.

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Cancer is the result of accumulated mutations to a person's DNA. The mutations that can lead to cancer may be inherited or acquired. Multiple events have to occur to cells before cancer occurs (which is why few children get cancer, unless it is through inherited damage, and why those over 60 are more likely to get cancer).

Mutations may result through a loss of activity in Tumour Suppressor Genes (the brakes), or enhanced activity by Oncogenes (accelerators), that regulate the way our cells work. So, whilst we may have a genetic predisposition to a particular cancer it needs further 'hits' to turn this into cancer. The damage, or additional damage, can be caused by a wide variety of factors such as: lifestyle (diet, drink, smoking, sunbathing etc.), radiation exposure, stress, viral infection, chemicals.

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