

Cancer



What are cells?

Our bodies are made up of hundreds of trillions of cells. Each tissue and organ are made of cells, which are all very different depending on where they are in the body. For example, hepatocytes are the cells in the liver, red blood cells in the blood, or renal cells in the kidney.

Our bodies are always making new cells to enable us to grow, to replace worn-out cells, or to heal damaged cells after injury. This process is controlled by the genes within the cells.

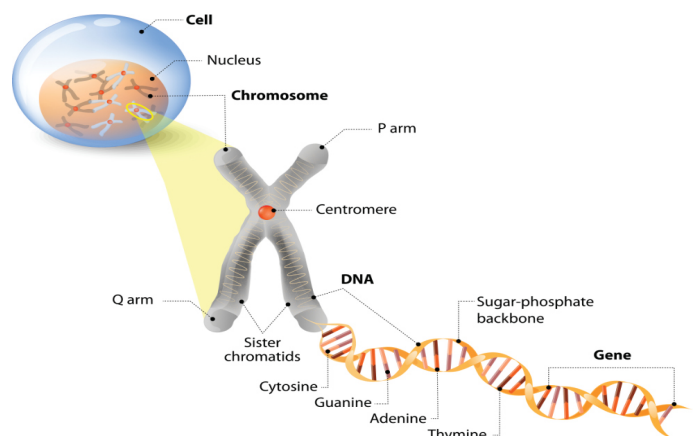
All cells contain a control centre called a nucleus. In the nucleus are the chromosomes, which are made up from thousands of genes. Genes are made up of DNA. Some genes act as instructions to make proteins for the growth of new cells while others control how cells divide.

Why does cancer start?

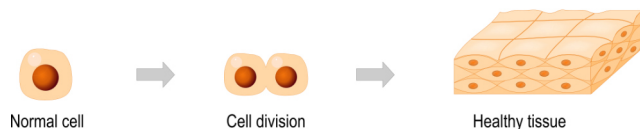
Cancer starts in normal cells. It can start in just one cell, or a small group of cells. Cells produce signals from genes that

control how the cells divide. If these signals are faulty or missing the cells might grow too much.

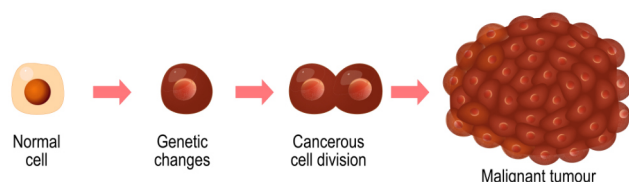
Cancer cells develop as a result of changes to genes, called mutations, which cause the cancer cells to divide and grow. These changes may be caused by several factors, including age, diet, lifestyle, genetic factors (which are inherited from parents) and the environment.



NORMAL CELL DEVELOPMENT



ABNORMAL CELL GROWTH



(see the *Essential guide: Staging and grading of kidney cancer* for more information), where it is in the body, and the genetic mutations that have caused the cancer, influence decisions about how the cancer is treated.

Can cancer come back after treatment?

Cancer can come back after surgery has removed the tumour. This possibility can be very worrying for patients. The reasons why cancer might come back are:

- The surgery didn't get rid of all the cancer cells and those left behind grew into a new tumour
- Cancer cells are too small to be seen by the naked eye (they are microscopic), so, although the surgeon might have removed everything that could be seen, some cancer cells may have already spread to other parts of the body and go on to form tumours or metastases.

Where does cancer grow?

Faulty genes in the cells cause the cancer to grow uncontrollably. Cancer cells can spread to other parts of the body. There are over 200 different types of cancer that can affect different body tissues or organs. The cells from each body tissue or organ have their own characteristics. When cancer spreads, it takes these characteristics with it. For example, if kidney cancer spreads from the kidney to the liver, the cells in the tumour in the liver will look like kidney cancer cells and will be treated as kidney cancer cells.

The cancer cell grows and multiplies to form a growth or mass, called a tumour. A tumour forms because the rate the cancer cell grows and multiplies is faster than the rate of cell death.

The primary tumour is where the cancer starts. For blood cancers, the cancer can start anywhere in the blood or bone marrow.

How does cancer spread?

Tumours can be either malignant or benign. Malignant tumours are cancerous tumours. Malignant cells are different to normal cells. Malignant cells can spread away from the original tumour (metastasise) into nearby tissue and other distant areas of the body, such as the lungs, brain, and bone. They travel in the blood or in a fluid called lymph, which is in the lymphatic system.

Benign tumours are not cancers. The main difference between benign and malignant (cancerous) tumours is that benign tumours do not spread to other parts of the body. However, benign tumours may grow and get bigger.

The type of tumour, the stage and the grade of the tumour



Further reading

- Action Kidney Cancer:
<https://www.actionkidneycancer.org/kidney-cancer/newly-diagnosed/>
- Cancer Research UK:
<https://www.cancerresearchuk.org/about-cancer/what-is-cancer>
- Macmillan :
<https://be.macmillan.org.uk/cancer-information-and-support/worried-about-cancer/what-is-cancer>
- NHS:
<https://www.nhs.uk/conditions/cancer/>

Please see the Action Kidney Cancer glossary for definitions of the medical and scientific terms used in this Action Kidney Cancer Essential Guide:
<https://actionkidneycancer.org/glossary/>

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