

# MODULE: Cells

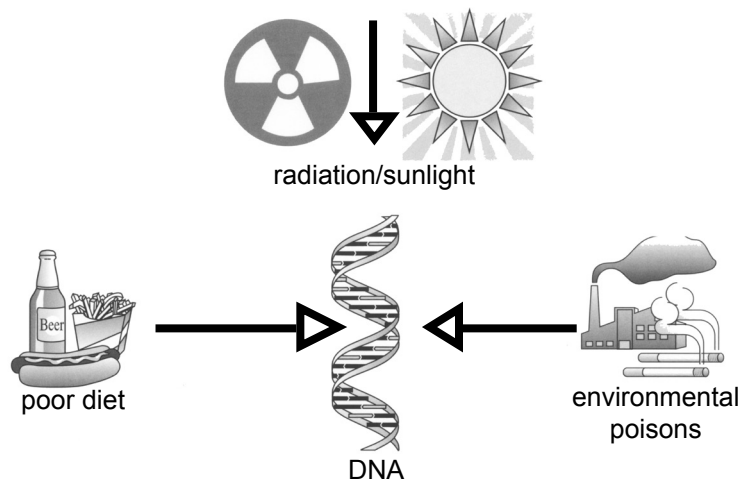
## Activity Sheet 1.6: Cancer

It is important that we understand a little more about why the research that our clients are carrying out is so important. Read the article below and then carry out the tasks I have suggested to help you understand what cancer is, what causes it, and for you to analyse and interpret the data linking smoking with cancer.

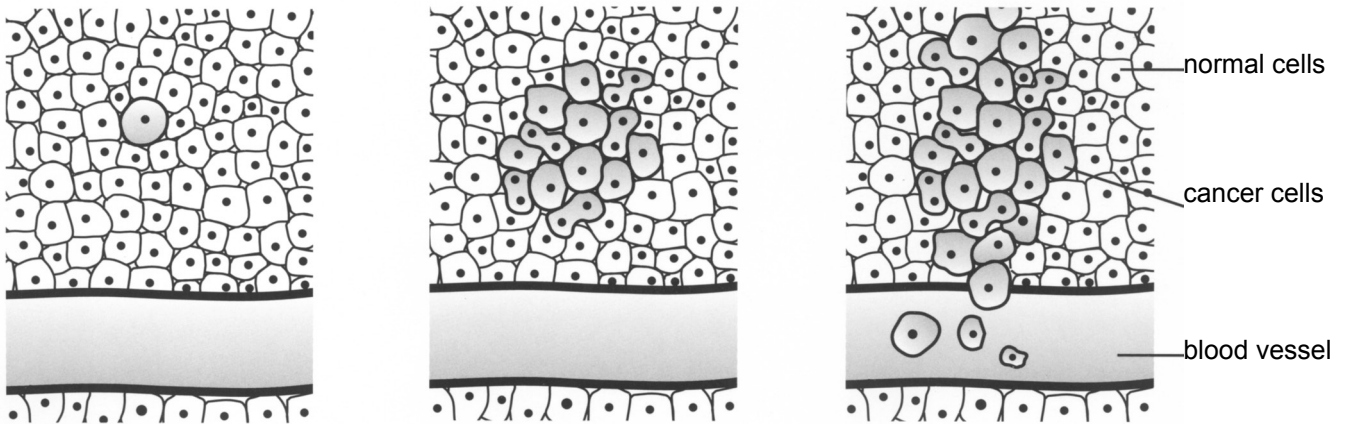
### What causes cancer?

One in three people are likely to get cancer at some time in their life. One in four people will eventually die from the disease. Our bodies are made up of billions of cells. Inside these cells there are genes. Genes are made up of a chemical called DNA. The DNA contains the instructions needed for a cell to survive and reproduce. Healthy, human cells behave in a very controlled way. They grow, divide, stop dividing and eventually die. They make new skin, new blood and all the other tissues that make up our bodies. A cancer cell is a cell 'out of control'. The DNA that makes up the genes inside the nucleus of a cancer cell is damaged.

The DNA inside the nucleus of a cell can be damaged in a number of ways.



The cell starts to divide and does not stop dividing. Eventually it may grow into a tumour. If a tumour is formed, some of the new cells can break away. They spread through the circulatory system to reach other parts of the body. Here they can start a new growth. If this happens the cancer spreads and becomes more difficult to treat.



There are over 200 types of cancer. For example, over 80% of children survive leukaemia, the most common form of childhood cancer.

Scientists think that 80% of cancers could be avoided each year if

- people took care in the sun
- stopped smoking
- followed a healthy diet
- were screened regularly and were aware of the facts.

One type of cancer that is proving hard to beat is lung cancer. In this activity you will consider some of the evidence to link smoking with lung cancer.

### **Up in smoke!**

The link between smoking and cancer was proven over 40 years ago by scientists working at the Imperial Cancer Research Fund. Since then there has been a rapid increase in the number of smoking-related deaths.

The data below was part of a scientific paper published by Professor Richard Peto in 1994.

Number of Smoking Related Deaths per Year (Millions)		
Year	Females	Males
1955	0.03	0.45
1965	0.07	0.79
1975	0.17	1.12
1985	0.32	1.37
1995	0.48	1.44

Answer the following questions in your research log:

- Suggest why there is an increase in the number of deaths?
- What causes cancer?
- How does cancer grow and spread?
- What could be the implications for the person?

### **Analysing and interpreting the data**

- Plot the information for both females and males on a graph. Put the dates along the horizontal axis and the number of deaths along the vertical axis.
- Draw two curves as close to the points as you can.
- In your research log write three sentences that describe what the graph shows.
- Explain the differences that you see.
- Find out what is meant by 'smoking-related death'.

### Further discussion

Describe some possible screening that people suspected of having cancer should be given. Identify possible factors that can cause cancer. An example has been done for you.

Cancer Type	Screened Organ	Possible Cause
Lung cancer	Lung	Smoking

How could the cancers you have listed be prevented or reduced?

The scientific paper also included the following statements.

- Half of all the teenagers who smoke will die from smoking-related diseases if they continue to smoke.
- Most of those killed by tobacco were not particularly heavy smokers but most did start in their teenage years.
- Stopping smoking works, even in middle age. If you stop smoking before having cancer or another serious disease it will reduce the risk of death due to smoking related diseases.

Using the information from the statements above to answer the following questions in your research log

- f. If all the members of your team started to smoke cigarettes this week and never gave up, how many of your team mates could die from smoking-related diseases?
- g. Why do you think it is important to teach teenagers about the risks of smoking?
- h. What evidence from the sentences above could you use to back up the statement “it’s never too late to stop”.