

FIGHTING CANCER

Sadly, most of us know someone who's been affected by cancer. It can be a devastating disease. But by understanding how cancer works and what causes it, scientists are discovering more ways to treat patients.

Our body constantly replaces cells. It controls how fast old cells die and how fast cells divide to make new ones. Our bodies also check the health of new cells and label damaged ones for disposal. Most of the time, this is well balanced. But if our body's sensors stop working, damaged cells can divide and multiply unchecked until there are too many to cope with. Clusters of damaged cells (called a tumour) can take over organs and tissues – this is when people get really ill.

BIOLOGY FACT

In the UK, 50% of people with cancer now survive 10 or more years.

www.cancerresearchuk.org

MEET THE SCIENTIST

Dr Laura Danielson is a biomedical scientist. Her research focuses on finding new drugs to treat cancer in children. Laura says: "I use mouse models of cancer to ask *if* new medicines can kill cancer cells and, importantly, *how* they can kill them."

Laura works with a team of other biologists, chemists, physicists and drug company employees to design studies in which they treat tumours in mice, and then use live imaging to see how the drug affects the tumour.

"Discovering this biology is very important," says Laura, "because we need to understand why some drugs don't work and how the cancer cells can become resistant. My aim is to provide sufficient data to support the entry of a new drug into the clinic to improve the lives of children with cancer."



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How can we treat cancer?

There are lots of ways to treat cancer, such as surgery, chemotherapy and radiotherapy.

Surgery is used to cut the tumour out of the body, providing it's small enough to safely do so.

Chemotherapy medicines are taken as tablets or can be injected. They kill cancer cells, but can kill normal cells as well. This is why cancer patients' hair sometimes falls out – the medicine kills off the fastest-growing cells in the body. New types of chemotherapy aim to target only the cancer cells, but they're very expensive and scientists need to better understand how they work.

Radiotherapy is a way of using very high energy to kill cancer cells. It can be internal (a small radioactive 'seed' is placed inside the patient) or external (a linear accelerator machine 'fires' high-energy beams at the cancer). Normal cells sometimes get hit too, but they can usually repair themselves after lots of rest. Cancer cells are more vulnerable because they are already damaged, so a second hit finishes them off.

Some patients need all three, some need only one or two. It depends how big, and where, the tumour is.

Can we prevent cancer?

We can reduce our risk by having a well-balanced diet, exercising frequently, not smoking and not drinking too much alcohol. These lifestyle choices reduce the risk of other health problems too: poor diet increases the risk of heart disease and stroke, smoking can cause breathing problems, and too much alcohol damages the liver.

Screening checks for cancer 'risk markers'. It is not a diagnostic tool; someone who is found to be at risk can have further tests to diagnose cancer in its early stages and improve their survival chances. Scientists are working on ways to improve screening to reduce false positive results – which can lead to unnecessary treatment – while ensuring that risk markers are still found.

In the UK, 50% of people with cancer now survive 10 or more years; 82% of children with cancer survive five or more years. And scientists are still working on more ways to treat cancer, using hormones, stem cells and immunotherapy, for example. Some are already available, others need more research.

Source: www.cancerresearchuk.org

