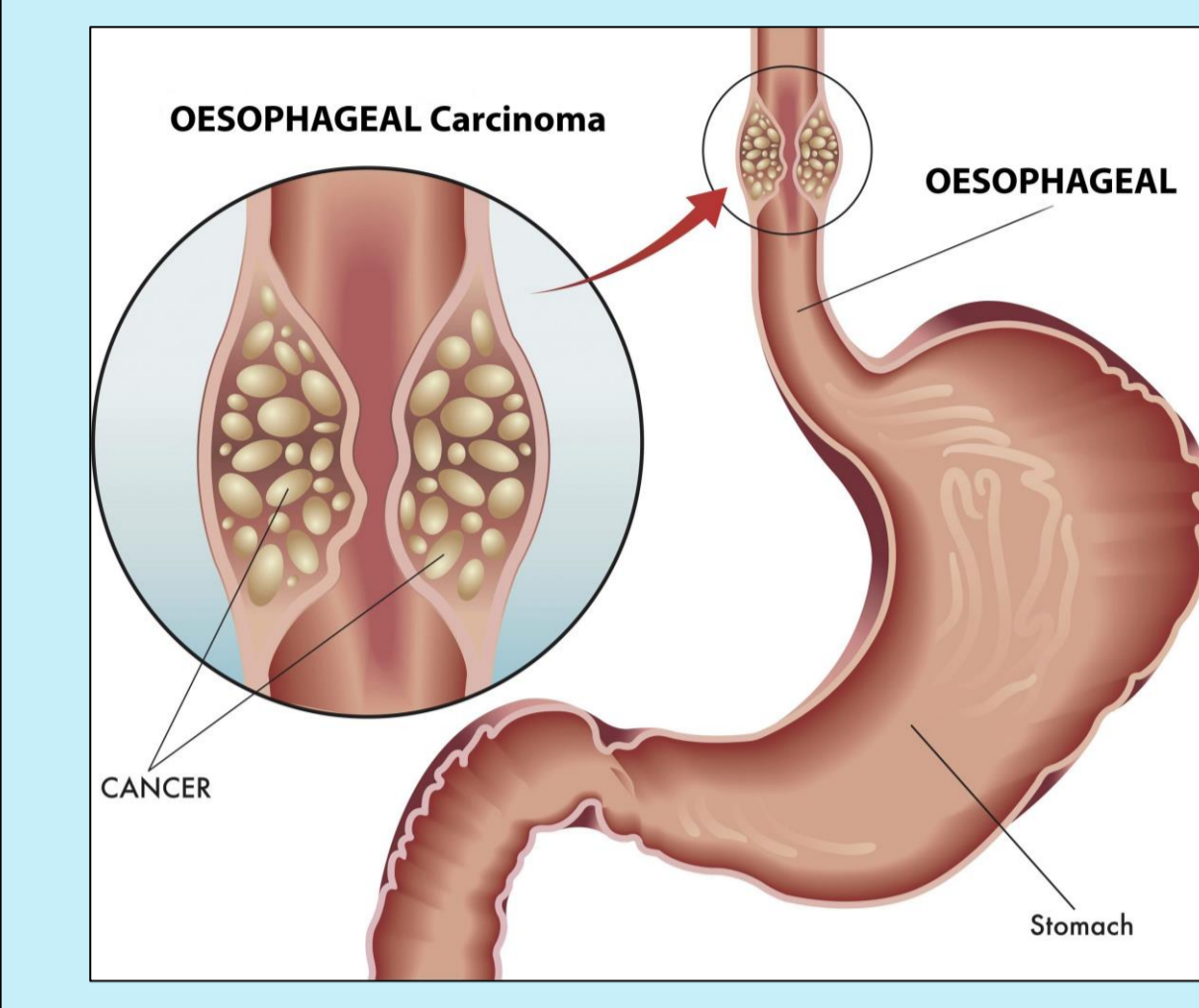
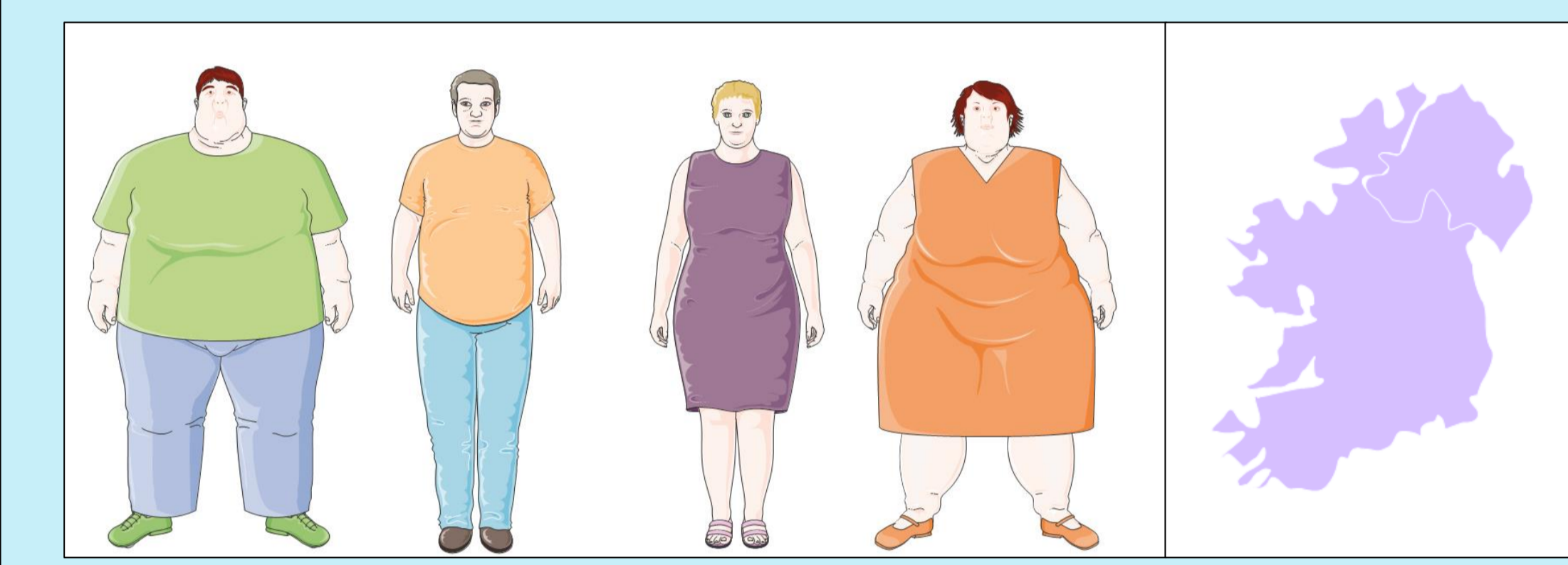


Why does our research matter?



Oesophageal Cancer (OC) is a cancer of the food pipe and develops when cells in the oesophagus change and grow abnormally. This causes difficulty swallowing as the tumour grows and narrows the oesophagus.

OC affects **more than 400 people in Ireland** every year and 600,000 people worldwide.

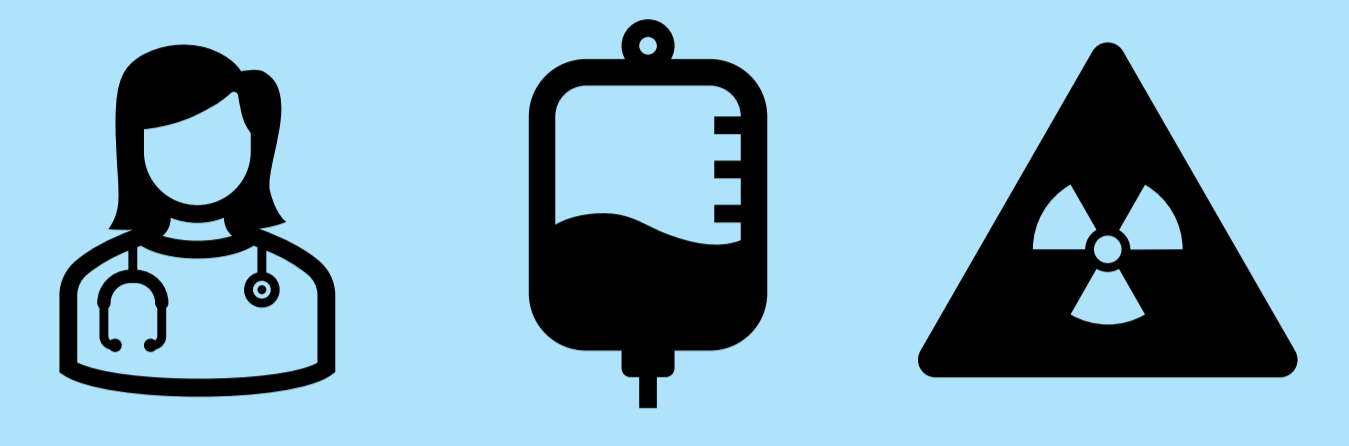


3 in 4 adults in Ireland over 50 years old are either overweight or obese

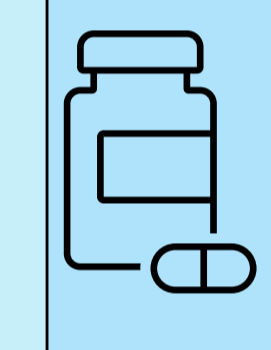
There are many risks factors linked to the development of OC but one of the biggest risk is **obesity**. In Ireland, **3 in 4 adults over 50 years old** are either **overweight or obese**.

Worldwide, obesity is rising at an alarming rate and in parallel with OC rates.

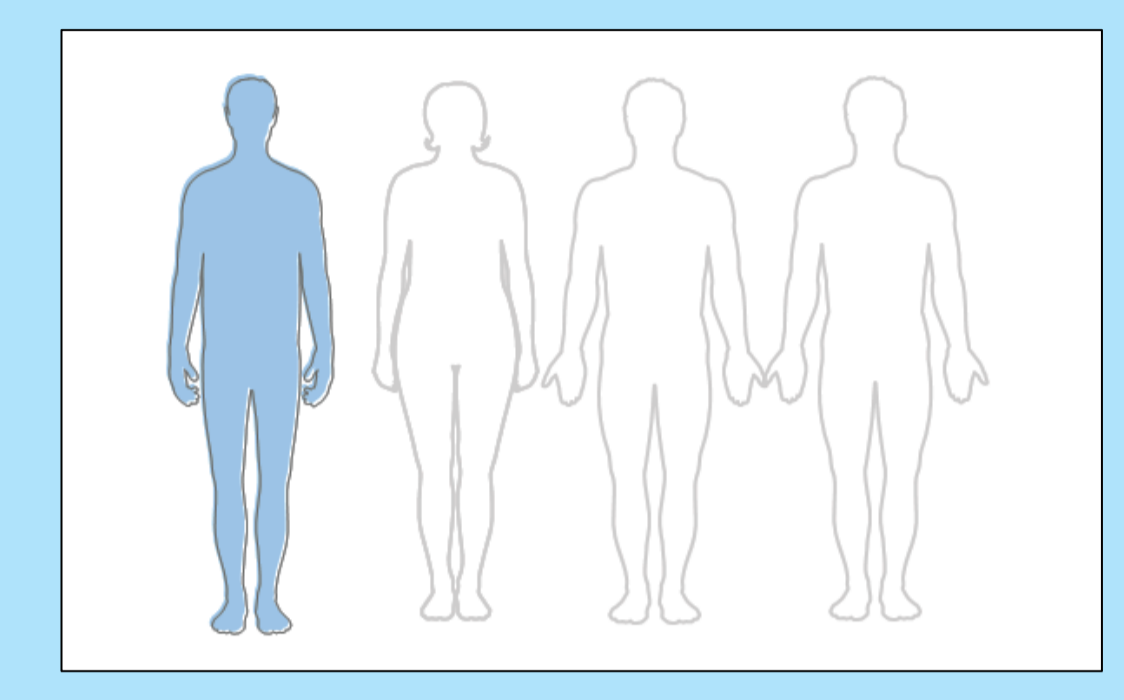
Why are we doing this research?



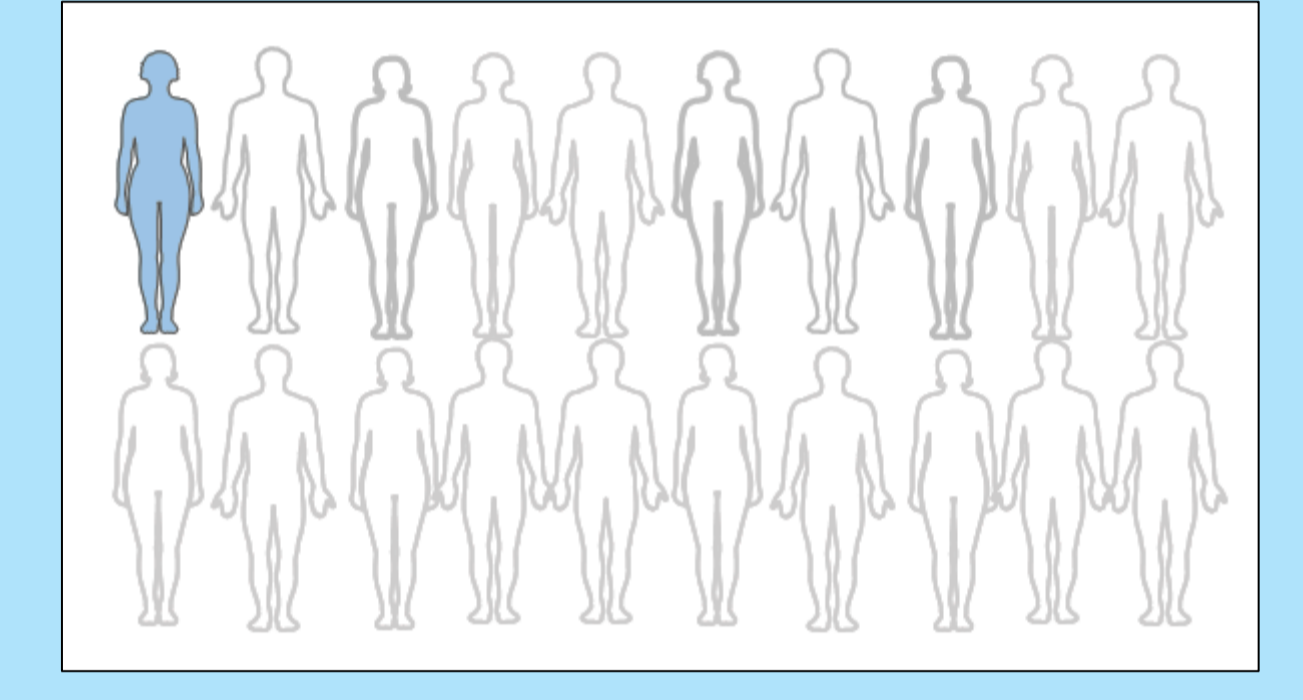
Only 3 in 10 OC patients respond to surgery, chemotherapy and radiation therapy, which are the most used therapies for this type of cancer.



This research is important because we **urgently need more effective drugs and better treatments** for OC patients, to improve their survival rate and provide better treatment options.



1 in 4 OC patient survives beyond 5 years

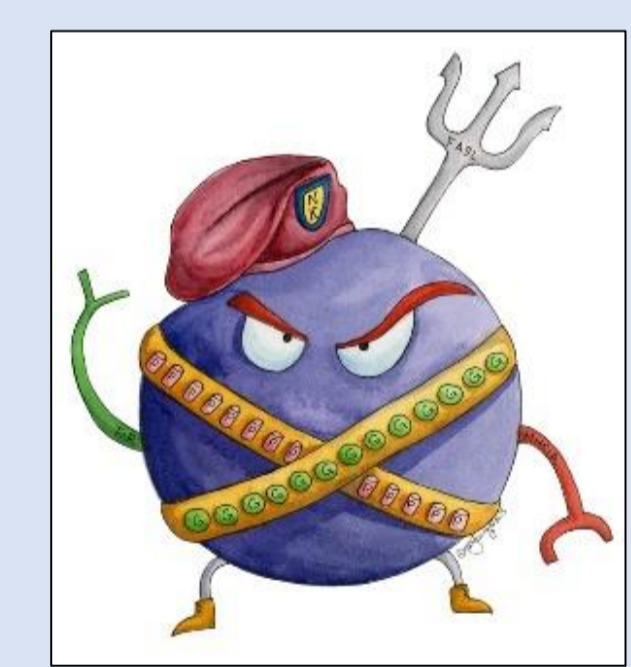


1 in 20 OC patient with metastasis survives beyond 5 years

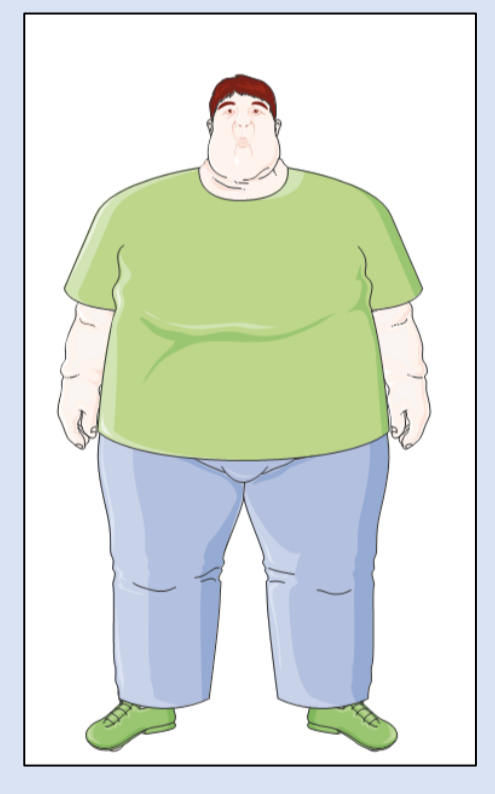
Only 1 in 4 OC patients will survive beyond 5 years, and this prognosis is even worse if the cancer has spread to other parts of the body with only 1 in 20 OC patients surviving beyond 5 years.

What have we learned so far?

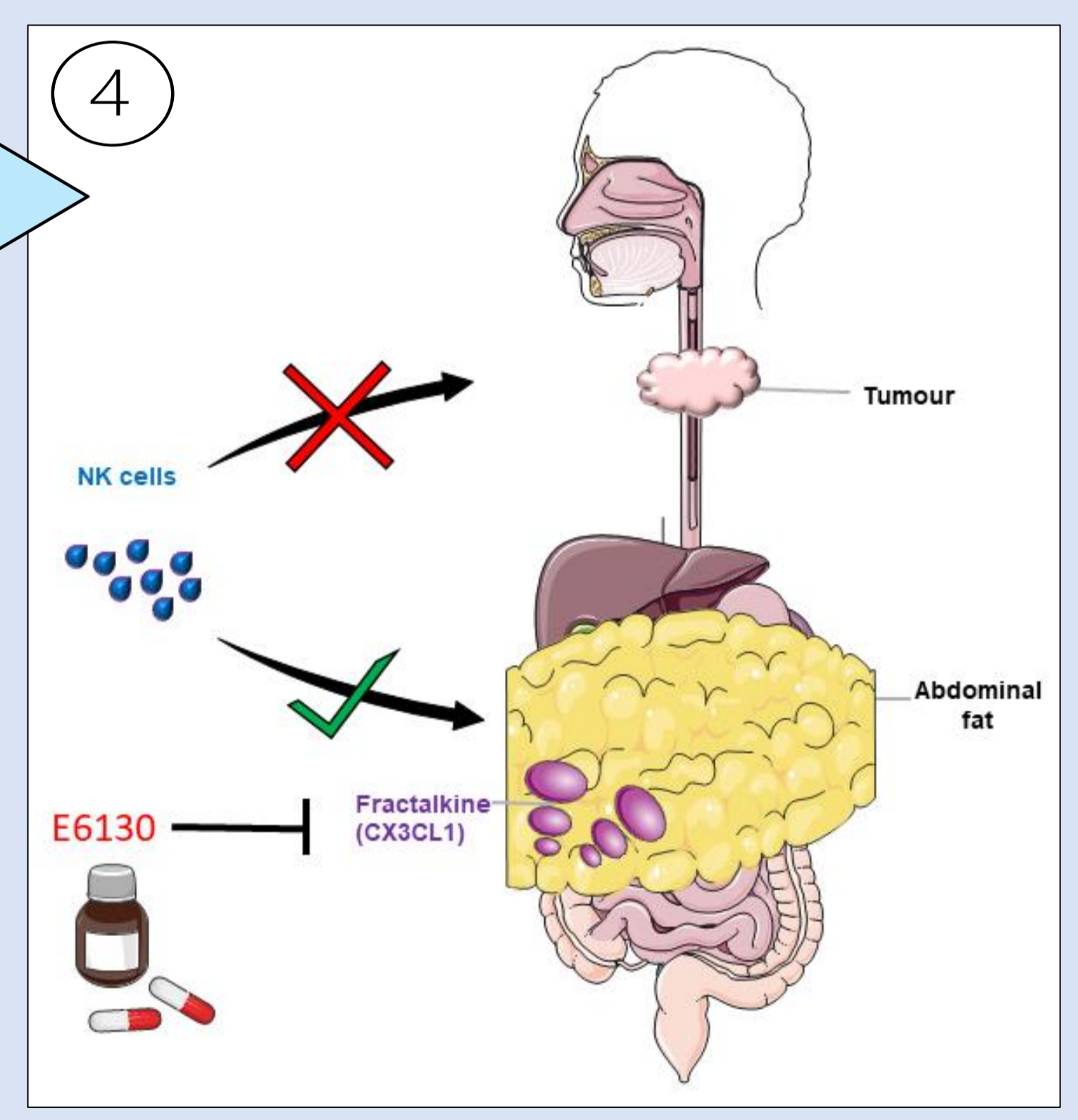
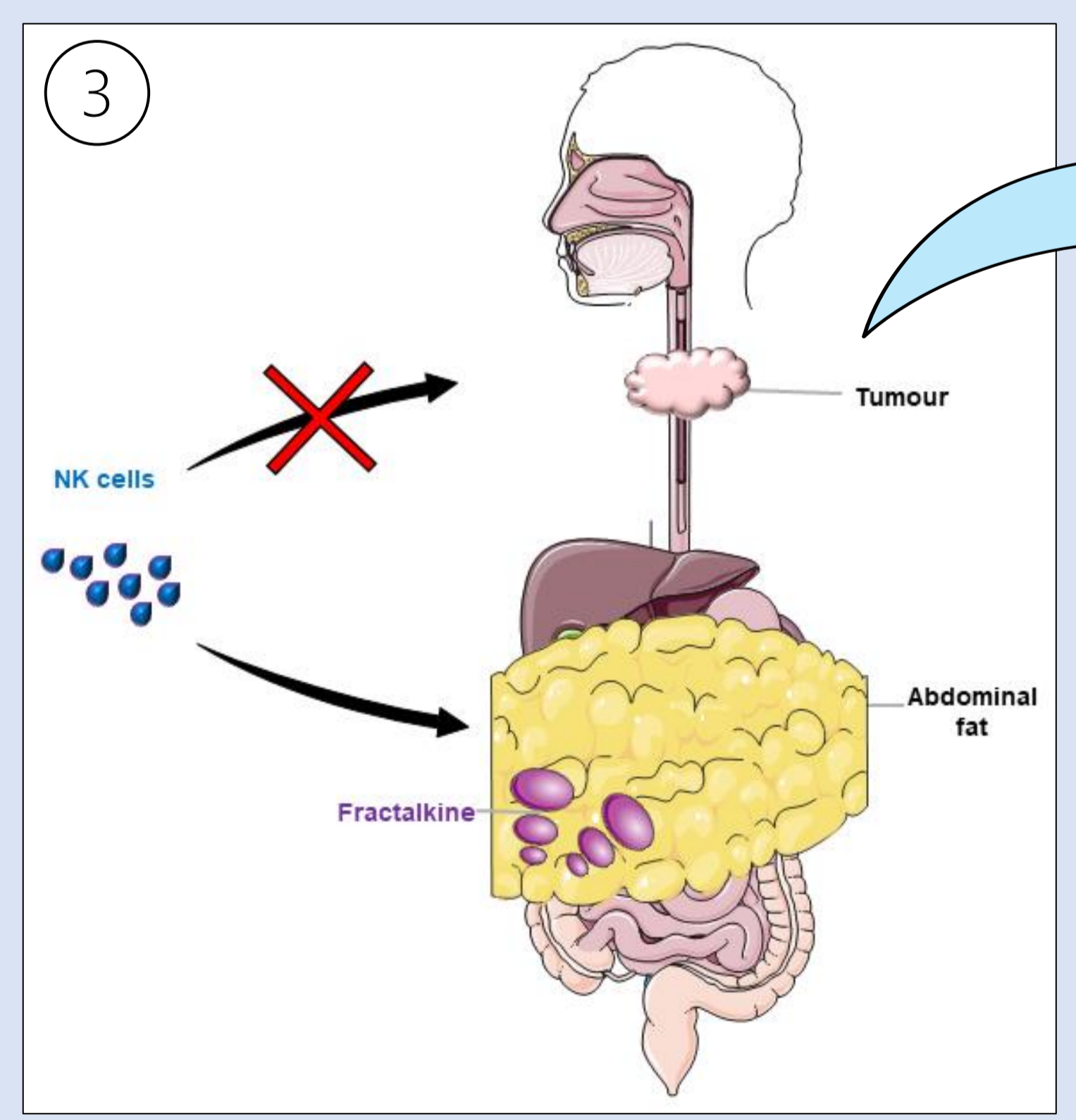
1 Our **immune system**, which is designed to kill cancer cells, is **weakened** in cancer patients, and this is even **worse in obese cancer patients** where patients have continuous inflammation.



NK cells

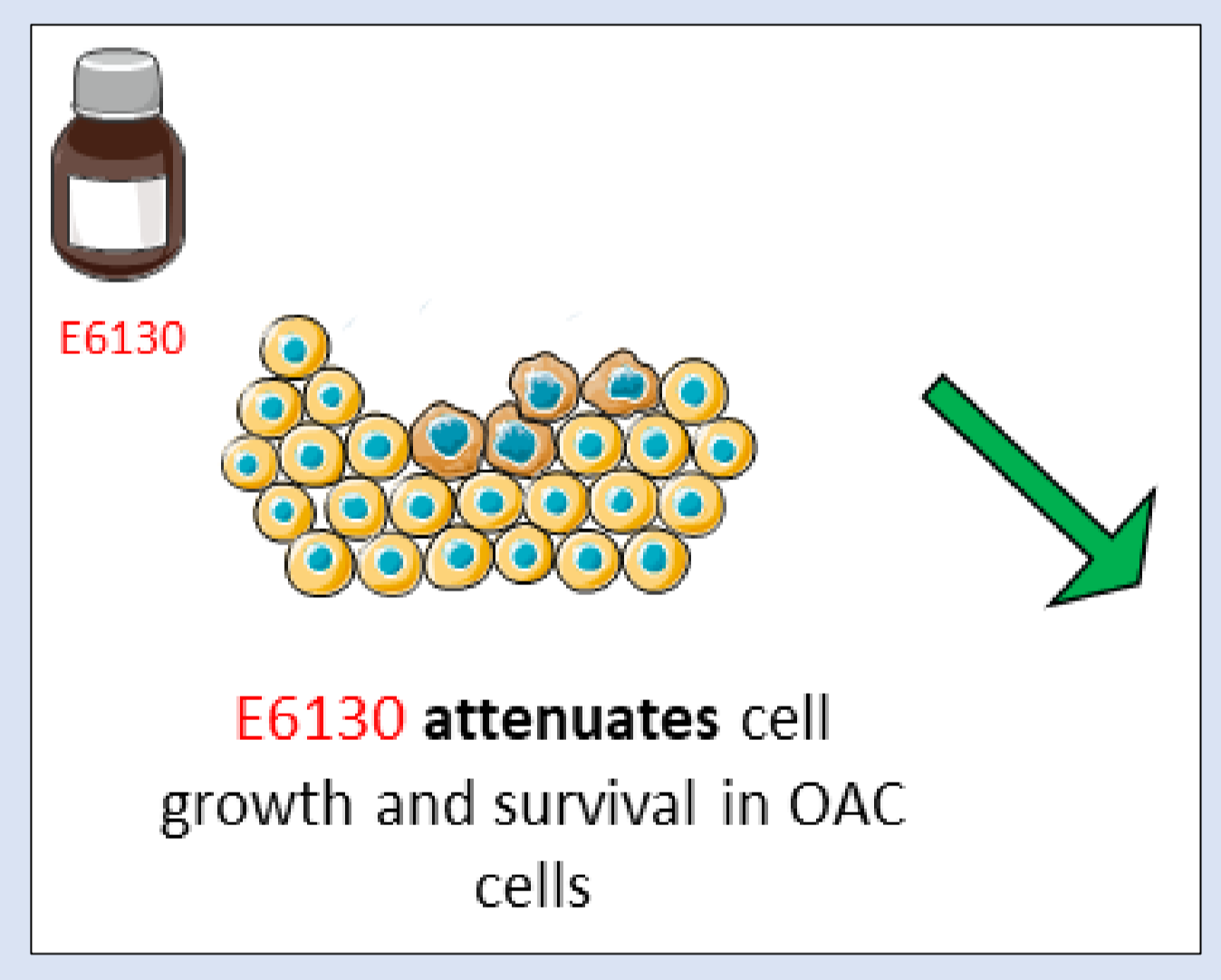
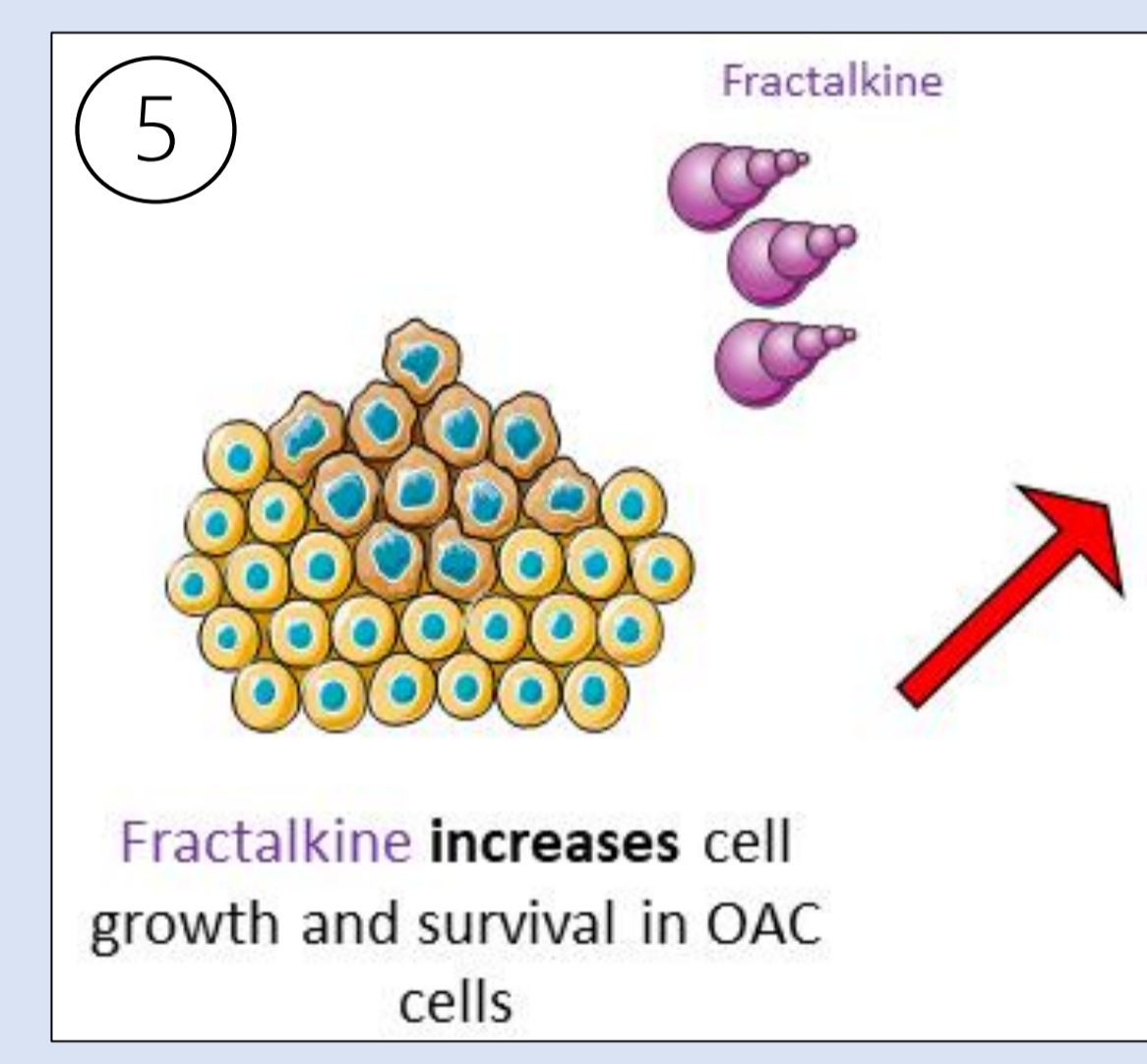


2 **Natural Killer (NK)** cells are the cells of immune system that are designed to eradicate cancer cells from the body. However, **obese OC patients have the lowest numbers of NK cells**, and our group has found that this is because NK cells are pulled to abdominal fat by a protein called **fractalkine**.



3 Once **in the fat, NK cells are blocked** and therefore unable to reach the tumour in the oesophagus.

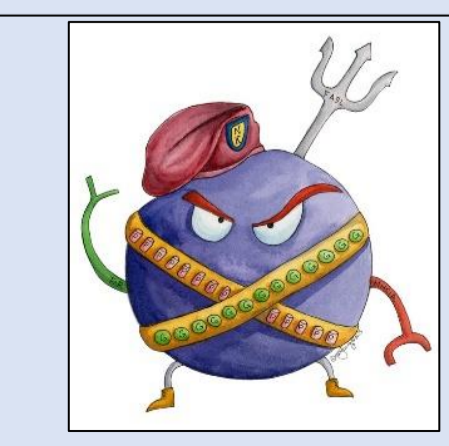
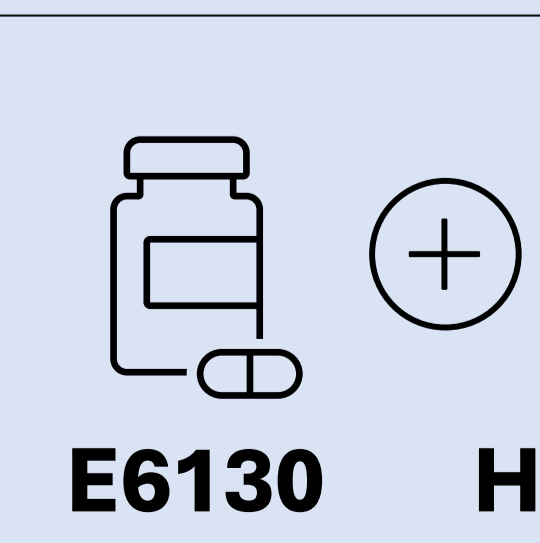
4 Our group has shown that a drug, called **E6130**, can block fractalkine from pulling NK cells to the fat and **they can be redirected towards the tumour**.



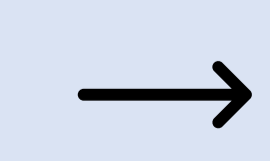
5 Moreover, we have learned that **fractalkine helps OC cells to grow and survive but E6130 can reduce this**.

What do we hope to learn?

1. Can E6130 release NK cells from the fat to help them kill cancer cells?
2. Can healthy NK cells be engineered to bypass the abdominal fat and move towards oesophageal tumours?
3. Can a combination of healthy NK cells and E6130 ultimately improve OC patient survival?



E6130 + Healthy NK cells



Better treatment for oesophageal cancer? That's what we hope to find out!