

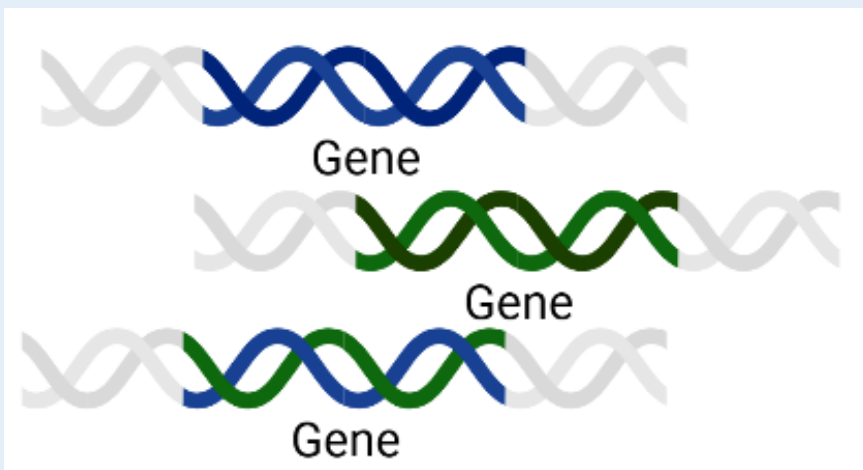
# Genetics – moving away from a “one size fits all” approach to cancer treatment

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## Personalised Medicine

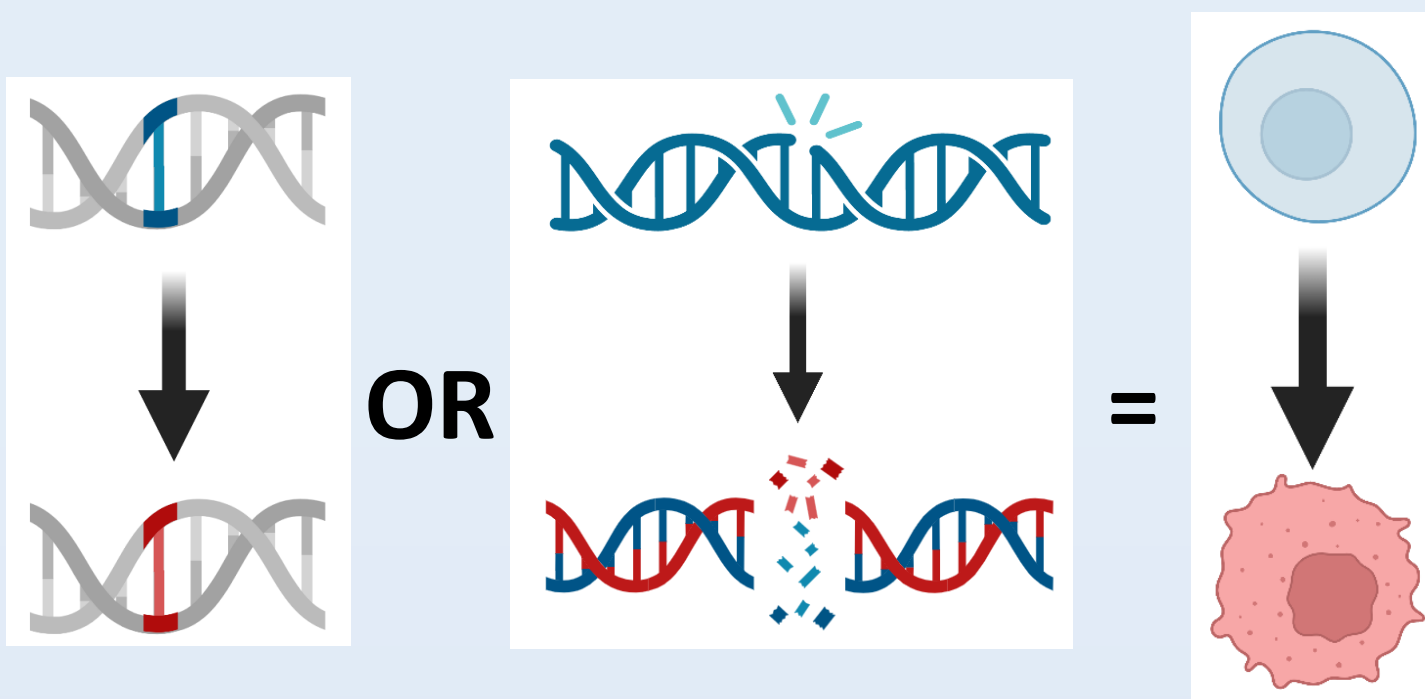
### 1. Jeans/Genes

Jeans come in many sizes, colours, patterns and styles. They can be part of your unique style and image – part of what makes you you!



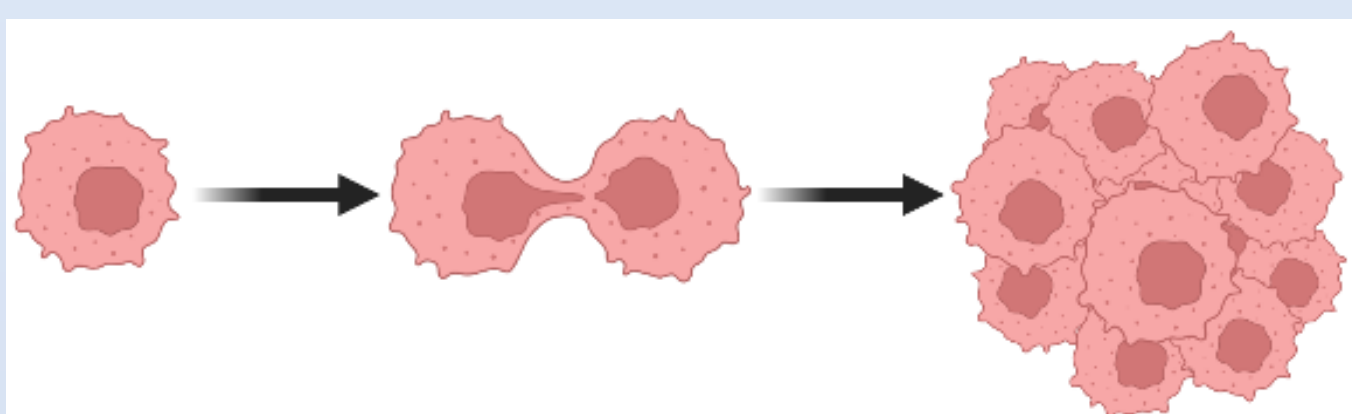
Genes are very similar. Most of them are slightly different from person to person, but you don't get to choose them!

Things can go wrong when jeans are being made: A stitch gets missed and they fall apart; They get stuck in a machine and you end up with just the front half. You're left with jeans that are pretty weird or useless!



Mistakes can happen in your genes when they're being copied and results in some strange cells.

Sometimes, these strange cells divide and make lots more. This can lead to tumours (cancer). Cancer can prevent our organs working like they're supposed to and make us rather ill.

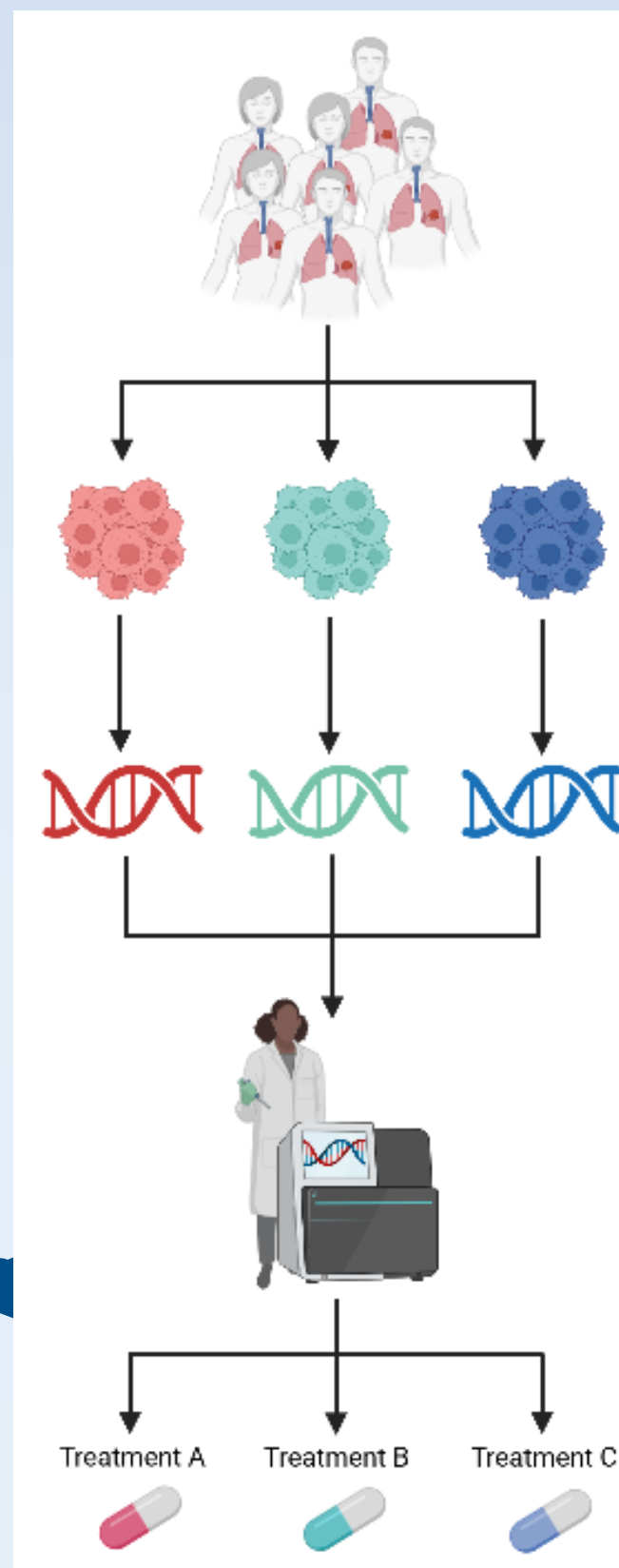


Cancer treatment used to be “one size fits all” where it was the same for a lot of patients.

Most treatments were harsh, made people very ill, and caused hair loss. They also did not always work.

### 2. Analysing genes in tumours

Scientists later discovered that each cancer is unique, and each is caused by different types or combinations of gene mistakes.



Here we have a group of patients. All of them have lung cancer, but not all are caused by the same thing.

Scientists can test the tumour DNA for each patient to find out which gene mistakes caused it.

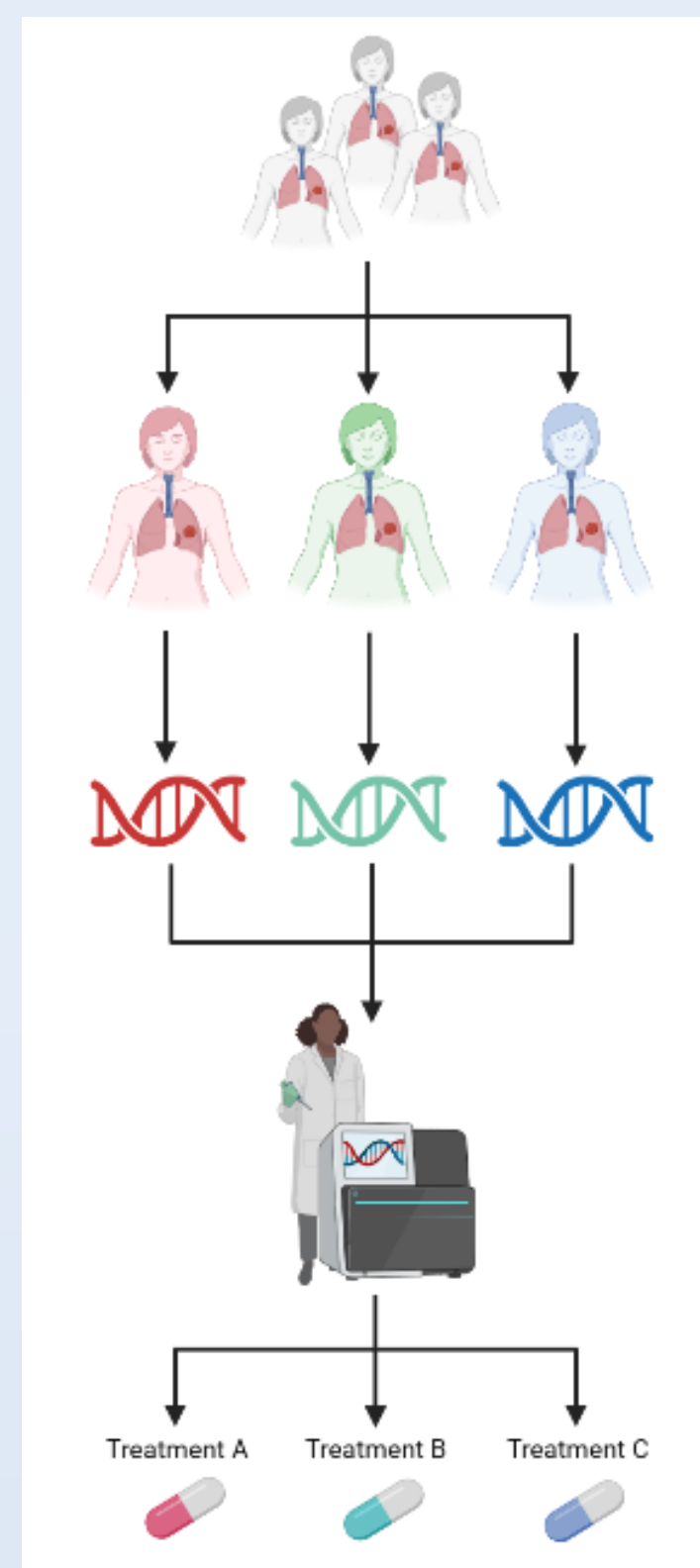
Therapies can be designed to target the specific gene mistake that caused that tumour. Each patient receives a treatment tailored to their tumour.

### 3. Analysing genes in patients

Scientists wondered whether patients' own DNA could also be affecting the likelihood of therapy working or causing side effects.

Scientists tested the DNA of cancer patients and identified genes where certain versions caused specific treatments to not work as well or caused more severe side effects.

Patients with these gene versions can be identified and given different drug types or amounts to prevent side effects and make sure their treatment works.



### 4. Personalised cancer therapy

- Treatment is tailor-made to each patient.
- Targets the gene mistake that caused the cancer.
- Treatment is more likely to be effective, and less likely to have side effects.

There is still so much to learn about the gene mistakes that cause cancer and loads of potential treatments to develop. This is part of what makes medical genetics such an exciting field to work in!