

Genomics Lite:

Genomic Surveillance in Focus

Learning Resources



These resources are designed to support and further attendees understanding of genomic surveillance, and are aimed at students in upper secondary years (e.g. year 10 and higher).

For further resources, visit [yourgenome.org](https://www.yourgenome.org)

What is genomic surveillance?

Genomic surveillance involves sequencing the genetic material of pathogens that cause infectious diseases, identifying changes linked to the origins or characteristics of a disease.

<https://www.yourgenome.org/facts/what-is-genomic-surveillance>

<https://www.yourgenome.org/stories/genomic-surveillance-in-action>

These changes, or mutations, occur when viruses replicate their genetic material - DNA or RNA - inside the hosts cell. Find out more about how viruses including Covid-19 evolve.

<https://www.yourgenome.org/facts/what-are-covid-19-variants-and-why-is-genomics-surveillance-of-them-important>

<https://www.yourgenome.org/facts/what-is-a-mutation>

<https://www.bbc.co.uk/bitesize/guides/z83qfcw/revision/3>

Scientists can track these mutations over time to see how viruses spread during an outbreak, when new variants emerge, and how the outbreak might be best contained.

<https://wellcome.org/news/what-variant-expert-explains>

How has genomic surveillance been used during the COVID-19 pandemic?

From the start of the pandemic, scientists started sequencing the virus to better Covid-19.

<https://www.yourgenome.org/facts/what-is-covid-19>

<https://sangerinstitute.blog/2020/08/19/the-race-to-sequence-sars-cov-2/>

Since then, genomics surveillance has been used to understand how SARS-COV-2 first entered the UK.

<http://www.imperial.ac.uk/news/212093/covid-19-transmission-chains-uk-traced-back/>

Ongoing genomics surveillance, through sequencing large numbers of viral samples, has allowed scientists to understand and track the proportion of different COVID variants across the world.

<https://wellcome.org/news/track-coronavirus-variants-genomic-surveillance>

<https://nextstrain.org/ncov/open/global>

Scientists have paid particular attention to mutations in the spike protein, as this is the basis of most COVID vaccine mechanisms.

<https://www.nhsinform.scot/covid-19-vaccine/the-vaccines/how-the-vaccines-work>

This video highlights the genomic sequencing and surveillance of SARS-COV-2 at the Wellcome Sanger Institute:

<https://youtu.be/eboEybvK5Zs>