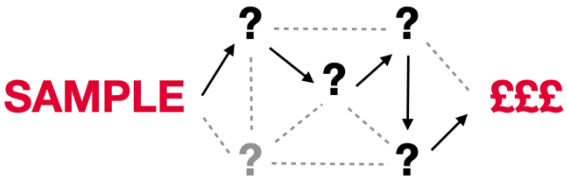
How much does NGS cost?

At the Wales Gene Park Genomics Facility, we focus on the use of Next Generation Sequencing (NGS) for health and healthcare related research, and we work collaboratively with researchers to enable the most flexible and cost-efficient approach possible to meet the needs of the project and research group.

Why are costs for the project not just per sample?

NGS technologies underpin many applications including transcriptomic, genomic and epigenomic investigations. The required aim of your NGS experiment determines how sequencing libraries are prepared from your samples and therefore which protocols or analyses are used. The final cost of your project is the result of combining these elements.



Key factors that influence the price of an NGS experiment include:

- The number of samples.
- The availability of samples (together or in batches).
- Library preparation costs.
- Depth of coverage, number of reads and read length.
- The choice of sequencing platform and flow cell.
- The requirements for bioinformatics analysis.
- Staff costs.

When costing a project, we will ask a series of questions about your experiment to help guide us to the information we need to put together accurate costings for your project.

Library preparation costs

We typically use commercial kits for the preparation of libraries. The cost of this element involves:

- Sequencing application and variants. For example, library prices for an RNAseq experiment of blood samples (requiring globin reduction) will be different to a more standard RNAseq library.
- Choice of manufacturer. Depending on the application used, there are often alternatives available with different price implications.
- The consumable costs associated with the library preparation.

We can also support sequencing for researchers who make their own NGS libraries.

Number of reads, depth of coverage and read length

Different experiments will need different amounts of sequencing to have the power to achieve the project aim.

For example, common mutations in a human exome may require 30x coverage, whereas finding rare variants or mosaicisms may require 1000–10,000x coverage and more sequencing per sample. A RNAseq project for differential expression at the gene level may require 20–30M reads, whereas an experiment looking for novel-splice sites may need 100M reads.

Sequencing platform and flow cell choice

We use different Illumina sequencing platforms, each of which has advantages and disadvantages and cost implications for your project.

We will try and use the most appropriate sequencer for your project and where possible look to combine experiments to run them on the larger instruments and in doing so, bring sequencing costs down.

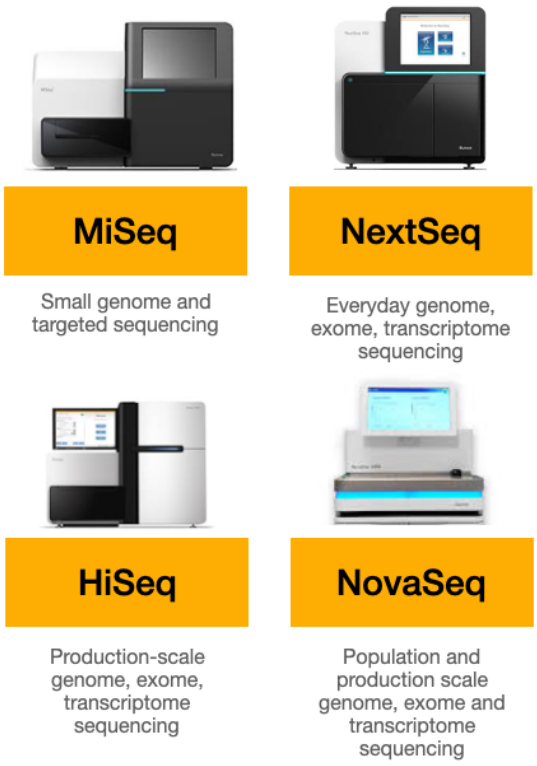


Image adapted from https://www.illumina.com/content/dam/illumina-marketing/documents/products/illumina_sequencing_introduction.pdf

Even on a single instrument, there are different flow cells available with a different sequencing output and with different costs per Gigabase of sequence. For example, the NovaSeq 6000 has options available to produce between 134 and 2000 Gigabases of sequence with different flow cells.

How do Wales Gene Park calculate costs?

Wales Gene Park works with researchers to determine the appropriate platform to use for the sequencing requirements of each project.

We encourage you to work with us to map out your experiment, explain your time pressures so that we have as much information as possible to generate outline costs for your project.

In previous more generous funding cycles, we have been able to charge solely for consumables, but we unfortunately now need to ask for a small contribution towards our staff costs. These are kept to a minimum and align with the expected time taken to compete the work. These contributions are critical to ensure the longer-term sustainability of Wales Gene Park and to maintain our local pool of expertise in NGS sequencing.

How long will a project take?

A straightforward project can be completed within a month, but the number of samples, the complexity of the project and the requirements and scale of any bioinformatic analysis all influence the total time needed for a project.

Wales Gene Park endeavor to maintain an open dialogue with researchers throughout a project, providing regular progress updates and clear communication about the expected timescales.

Next steps?

If you are considering a project that utilizes NGS, we would welcome the opportunity to speak with you about your project aims. Wales Gene Park is an infrastructure support group funded by the Welsh Government through Health and Care Research Wales, as such we are happy to collaborate on most health and healthcare related research.