Yourgene Health

Introducing **RANGER® TECHNOLOGY**

Next Generation Size Selection for Dynamic Target Enrichment of DNA

Our Instruments:

- LightBench®
- LightBench® Detect
- NIMBUS Select

Size Selection Applications:

- NIPT
- Oncology
- Gene Synthesis

Ranger® Technology can be applied across multiple applications to offer industry-leading scalability and precision for the size selection process, ensuring maximal enrichment, **every time.**

MKT075 Rev 2

Contents

Introducing Ranger® Technology

Yourgene Health

Ranger® Technology offers clinical and research laboratories true walkaway automation for DNA size selection, allowing enrichment of only the DNA of interest with record breaking precision and speed.

Choose the instrument which best suits your laboratory's needs and accomplish more, with less:

- Less CapEx equipment – our Ranger® instruments are a 3-in-1 solution
- Less hands-on time – thanks to walkaway automation
- Less DNA required– superior fragment enrichment capabilities

LightBench
with RANGER® TECHNOLOGY

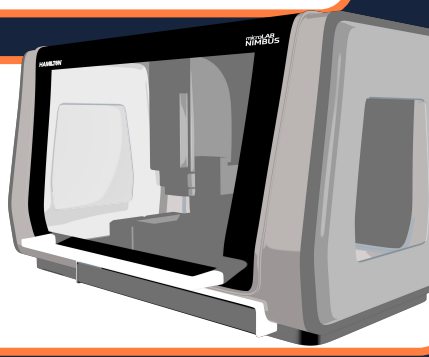
for Research Applications

- Up to 12 Samples
- Integration with robotic platforms
- Ideal solution for quality control applications

NIMBUS SELECT
with RANGER® TECHNOLOGY

High Throughput Platform

Automates sample loading and processing for up to 96 samples in a single run



LightBench® Detect
with RANGER® TECHNOLOGY

for Clinical Applications

- Up to 12 Samples
- Enabling EDTA cfDNA blood collection tubes

Core size selection functionality is complemented by the ability to perform fragment length analysis and fluorescence assays, making Ranger® instruments the **ideal solution for next generation sequencing (NGS) quality control applications.**

Ranger® for NIPT

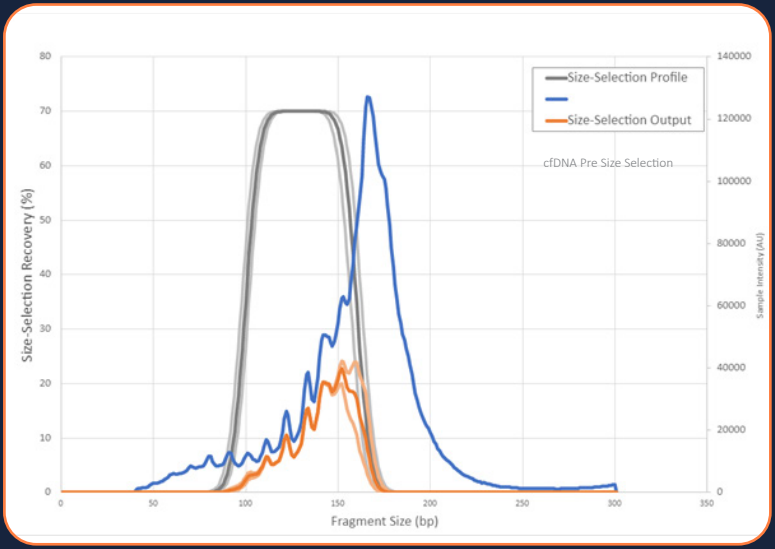


Figure 1: The primary distribution profile for all cell free DNA fragments in a maternal blood sample are shown in blue. Once the size selection range is applied (grey), the output from the Ranger instrument is fragments of fetal origin only (orange). Size selection ensures reproducibility in biomarker enrichment.

Ranger® Size Selection facilitates preferential exclusion of maternal circulating fetal DNA (cfDNA), selecting mostly fragments of fetal origin and permitting an **effective doubling of Fetal Fraction (FF%)** for:

- More consistent analysis
- Reduction in redraw rate
- Reduction in false positive rate
- Enabling EDTA cfDNA blood collection tubes

Ranger® Technology gives users the ability to detect tiny amounts of cell free fetal DNA (cffDNA) and enrich it.

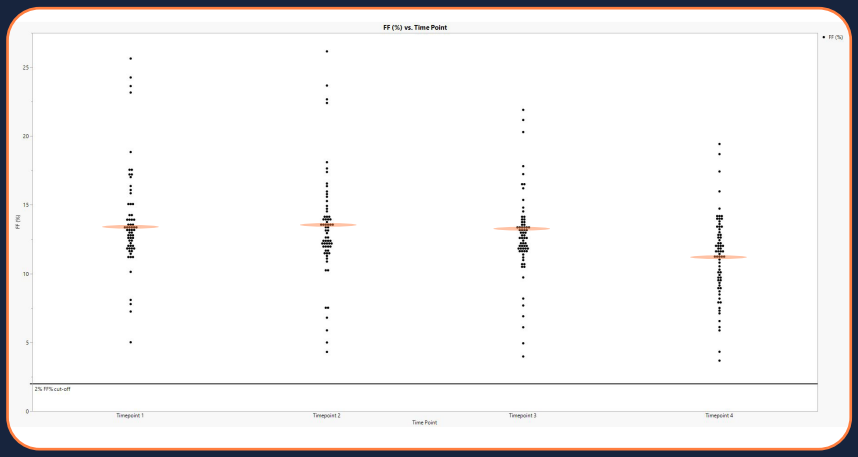


Figure 2: Fetal Fraction (FF%) recovery in EDTA tubes at 8 hours; 3 days; 5 days; 7 days. All timepoints showed enrichment of FF% significantly above common cut off at 4% thanks to Ranger® size selection.

2 x FETAL FRACTION ENRICHMENT

Scan the QR to view our Ranger® for NIPT web page

Ranger® for Oncology

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Suitable for oncology early detection and disease progression studies.

Circulating tumor DNA (ctDNA) is extremely low due to dilution by abundant normal circulating cell free DNA (ccfDNA).

Employing Ranger® Technology's automated size selection can:

- Enrich fragments of tumor origin
- Reduce sample complexity
- Improve sensitivity in cancer ctDNA-based applications
- Including detection of very low variant allele frequencies

2 x
ENRICHMENT

Ranger® affords clear additional benefits in **time** and **scalability**, especially in non-shedding cancer types where it is exceptionally difficult to detect tumour fraction in peripheral blood.

Scan the QR to view our Ranger®for Oncology web page

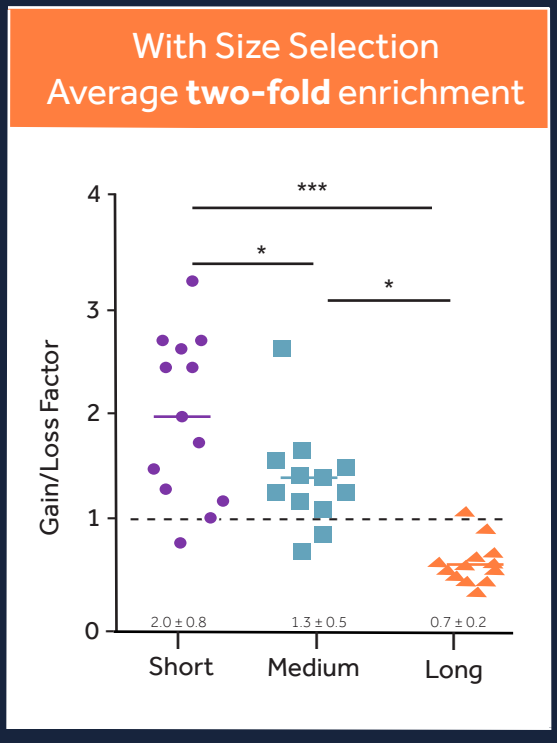
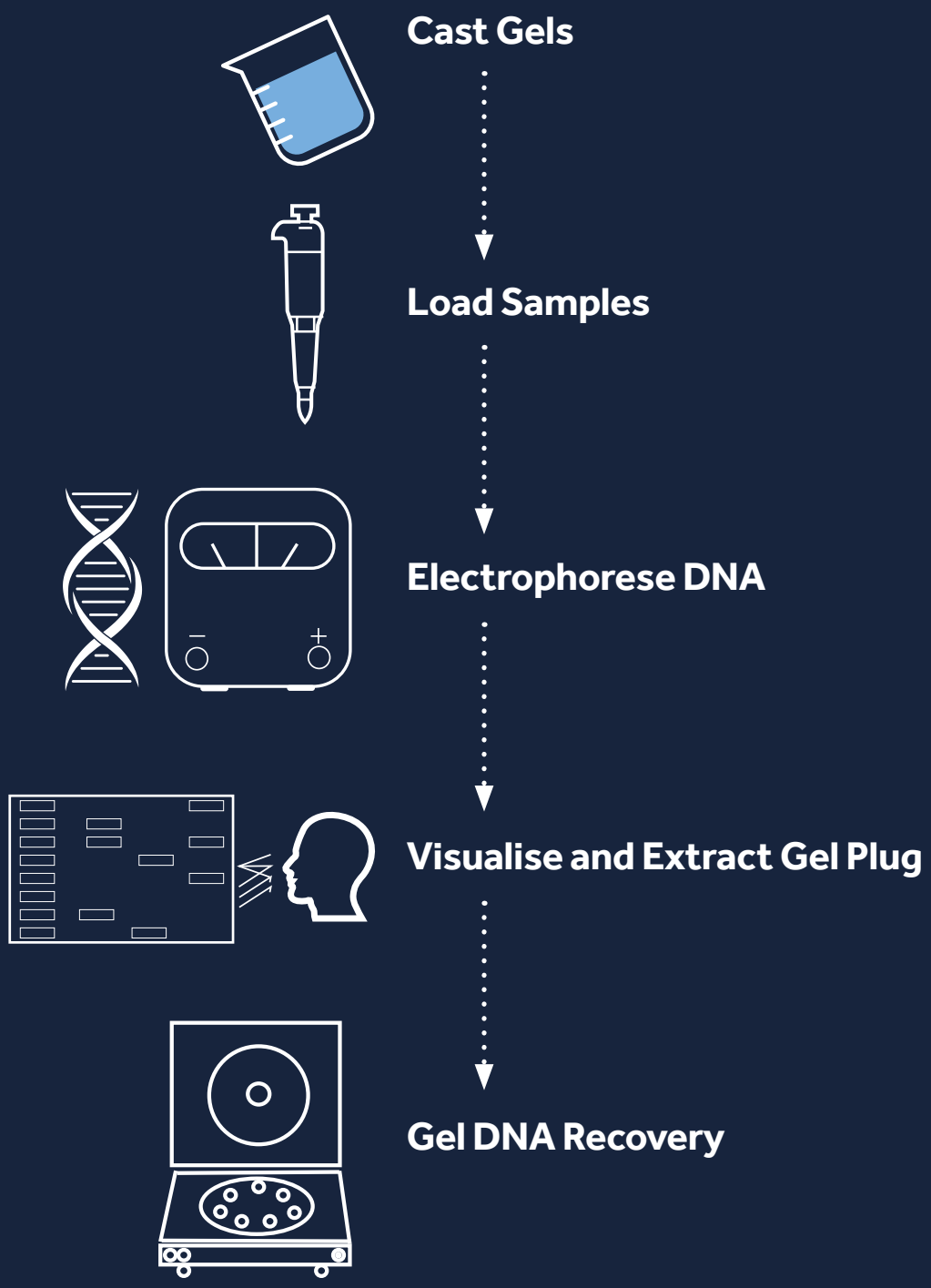


Figure 3: Automated selection of shorter ccfDNA fragments increases VAF: isolating size-based fractions from ccfDNA of solid tumor patients shows a statistically significant difference between short, intermediate and long fractions.

Get to the DNA you care about

Gel electrophoresis is a technique where a mixture of macromolecules, such as DNA, are separated based upon their size. Using an electrical field with an anode and cathode, the DNA (negatively charged) is pushed through a gel (such as agarose) containing small pores, away from the anode and towards the cathode. Smaller fragments of DNA will travel faster than longer ones, which allows for the mixture to be separated out into its component parts based on their size.

Without Ranger® Technology



Accurate targeting of DNA fragment lengths for recovery requires gel size selection. Manual gel size-selection is a labour-intensive task, with inconsistent outcomes.
Manual processing necessitates casting of gels, pipetting of samples, and irreproducible target isolation via gel plug excision.
All of this is automated with improvements to result consistency by Ranger® Technology.

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With Ranger® Technology

R

Scalable, Automated Size Selection

To enquire about Ranger®Technology, please email:

info@yourgenehealth.com

LightBench® with RANGER® TECHNOLOGY

Ranger® for Gene Synthesis

Scan the QR to view our Ranger® for Gene Synthesis web page

When longer DNA constructs are needed, employ size selection to minimise noise associated with truncation products and recover the full-length product of interest only.

The increasing ease with which DNA of longer lengths can be delivered is driving demand for these products. Vaccine manufacturing, therapeutic development and data storage are scenarios in which customers are lining up for products from cutting-edge gene synthesis entities.

Ranger® Technology employs machine-vision to process DNA via electrophoresis in a highly parallel fashion suitable for low and high scale cloning pipelines.

10 x IMPROVEMENT IN EFFICIENCY

Size-based purification and analytical protocols are automated on a single instrument – simplifying the workflow while improving the efficiency of the DNA synthesis process

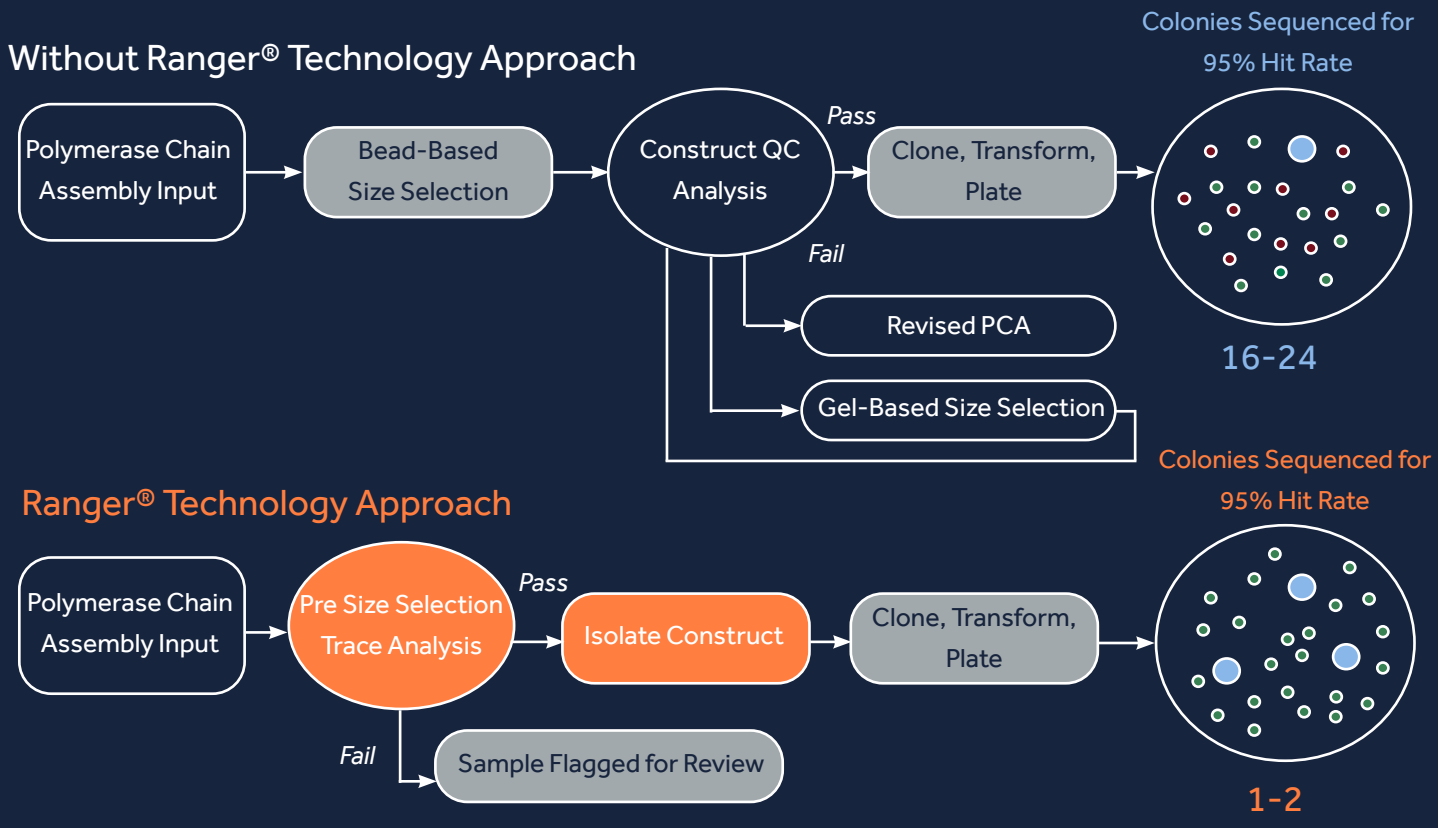

Figure 4: Comparison of Gene Synthesis with and without Ranger® Technology

Ranger® for Long Reads

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Metric	LightBench® and NIMBUS Select
Applicable Range	2,000 - 20,000 bp*
Accuracy	+/- 10%
Capacity	24
Sizing Reproducibility	5% CV
Quantitative Accuracy	20%**
Sizing Resolution	2,000 bp - 10,000 bp: 7% CV

Industry leading recovery rates for DNA fragments up to 20 kb for long read sequencing applications.

*: Up to 30,000bp in certain run conditions

**: 10% if using solution-based fluorescence assay (i.e. PicoGreen)

A flexible solution to meet *your* needs

We understand that every workflow is different and that the DNA you care about will vary in size depending on your application. That's why we provide our cassettes in a range of formats, enabling users to customize DNA markers and agarose gel compositions as required. This guarantees optimal LightBench® performance for every demand, with the flexibility to interchange different cassettes depending on the target DNA of interest.

To make this choice as simple as possible, the guide below demonstrates the appropriate gel and marker composition for various applications:

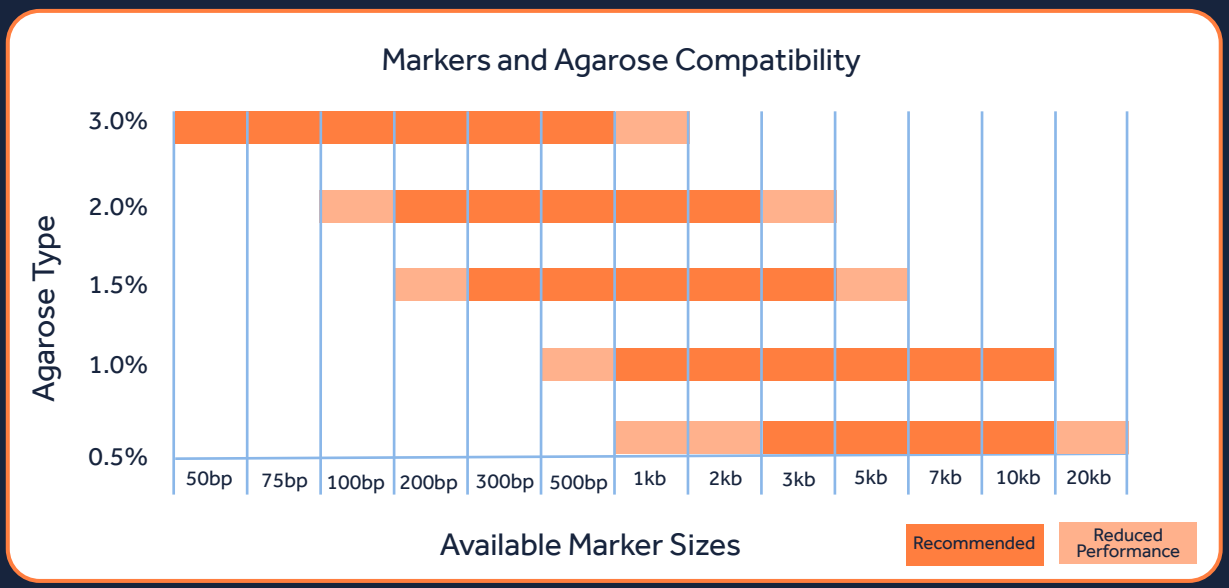

Figure 5: Markers and Agarose Compatibility

Size Selection Performance Specifications

Specification	Typical Value	Notes
Allowable Size Range	0-20 kbp+	Different gel percentages allow size selection targets across regions of this total range
Loading Capacity (Maximum loaded mass per construct)	≤1 kb: 500 ng - 2 µg 2 - 5 kb: 250 ng - 1.5 µg 10 kb: 500 ng - 1 µg 20 kb+ : 250 - 500 ng	Exact loading capacity depends on the size range of interest and the gel percentage chosen
Resolution	10 - 20 % *	Depends on the reagent kit and the run conditions. Resolution is here defined as the minimum difference in fragment length between the start or end of a size selection window and the peak of the closest off-target enrichment that ensures at least 90% rejection of said off-target fragment
No of Samples per Run	12 (CGI-Format) 8 (SBS-Format)	Depends on reagent kit selection
Run Time	1 - 4 hours	Depends on optimization of reagent kit selection, needed resolution
Intrinsic Recovery Efficiency	70 - 80 %	Dependent on run conditions, particularly the relationship betweent the target range and the extraction volume

What happens during Size Selection?

Below shows a single lane in one of our gel cassettes as time elapses during a size selection run. Once the DNA is loaded (along with reference markers either side of the sample of interest):

- User selects range of desired DNA lengths from approx 25bp – 35,000bp
- Larger fragments are removed first
- Dynamic voltage adjustment is then applied across all channels

This results in synchronised arrival of desired fragment sizes at extraction wells:

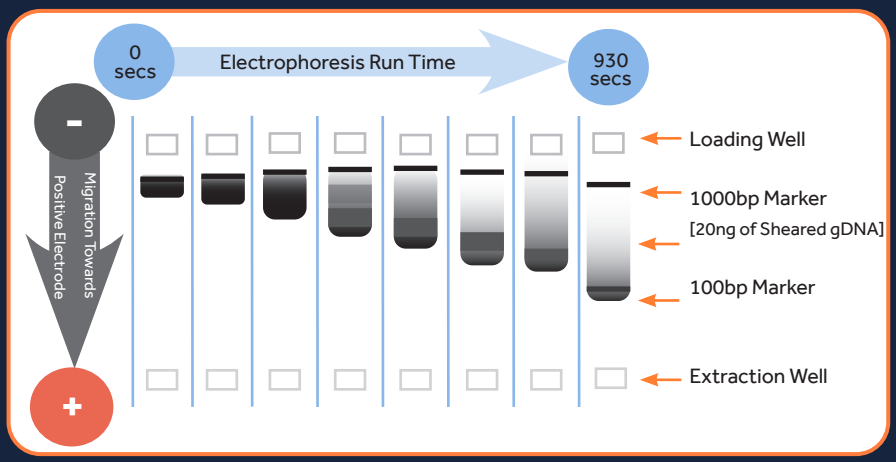

Figure 6: Size Selection Run showing fragment sizes in extraction well from 0 - 930 seconds.

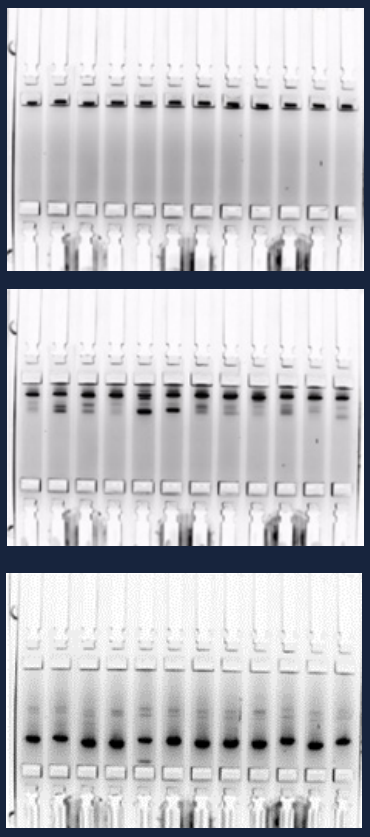

Figure 7: Top to bottom images showing Time Point 1 (0 Minutes), Time Point 2 (5 Minutes) and Time Point 3 (15 Minutes).

Join the Ranger® Revolution

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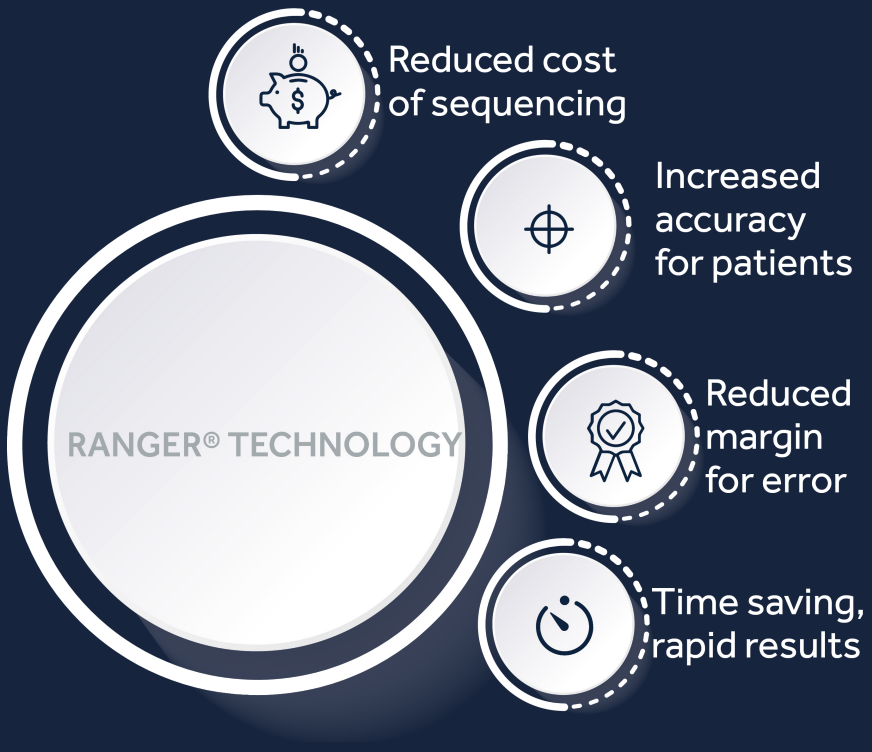


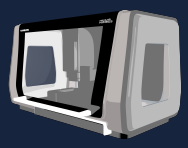
Providing a revolutionary automated high throughput gel electrophoresis platform for DNA Size Selection.

At Yourgene, we are focused on ***enabling scientific advances to positively impact human health,*** a mission which Ranger® Technology helps to deliver.

Interested in Ranger®?
Email: **info@yourgenehealth.com**

Ranger® Reference Guide





		LightBench®	LightBench® Detect	NIMBUS Select
Disease Area or Assay Development	NIPT	-	✓	✓
	Oncology	✓	-	✓
	Gene Synthesis	✓	-	✓
Function	Size Selection	✓	✓	✓
	Fragment Length Analysis	✓	✓	✓
	Fluorometric Assay	✓	✓	✓
Throughput	No. of Samples per run	12 Samples	12 Samples	96 Samples

Yourgene Health

Enabling Scientific Advances *to* Positively Impact Human Health

Yourgene Health

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Learn more about Ranger® Technology:

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