Ignite better insights

RNA & DNA Sequencing Solutions

sparQ NGS Product Guide

For Illumina® Sequencers

- Streamlined workflows
- Higher yields
- Superior coverage
- Wide input range

Quantabio

sparQ RNA-Seq HMR Kit

Ultra *FAST* RNA library prep with integrated rRNA & globin depletion

FEATURES & BENEFITS:

- High quality directional RNA library prep in 5 hours
- Simple workflow with 3 reaction tubes, 9 steps and 9 components
- Efficient and integrated removal of rRNA and globin mRNA from human/mouse/rat (HMR) samples
- Improved results for samples with limited quantity and/or poor quality RNA

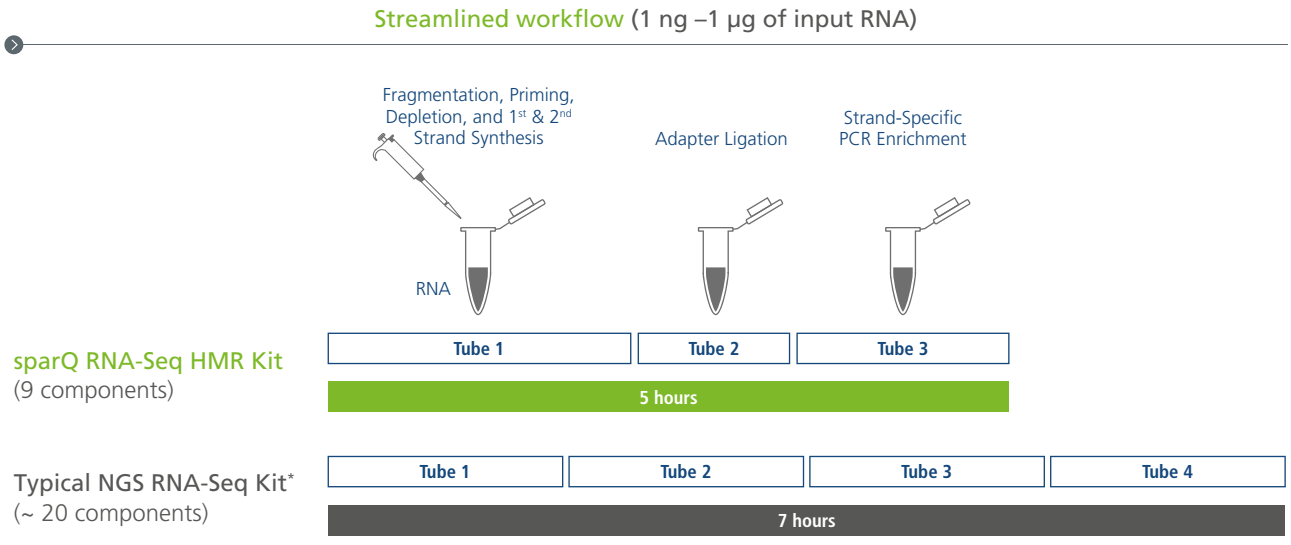


Figure 1 **sparQ RNA-Seq HMR Kit workflow is simplified to 3 reaction tubes, 9 steps and 9 components.** rRNA and globin mRNA removal is integrated with the RNA fragmentation and priming step, enabling faster time to result, less hands-on time and fewer pipetting steps.

Better Overall Coverage Uniformity

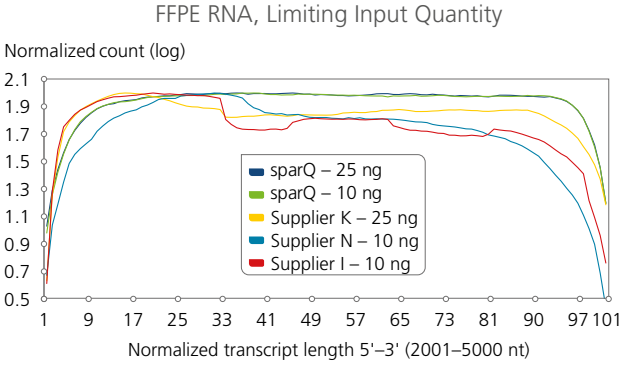


Figure 2 **Uniform 3' transcript coverage.** sparQ RNA-Seq HMR Kit was uniquely able to retain uniform 3' coverage for FFPE RNA, a feature that will help correctly identify full-length genes in low quality samples. For UHR RNA, all RNA-seq kits showed comparable uniformity.

Increased Unique Transcript Identification

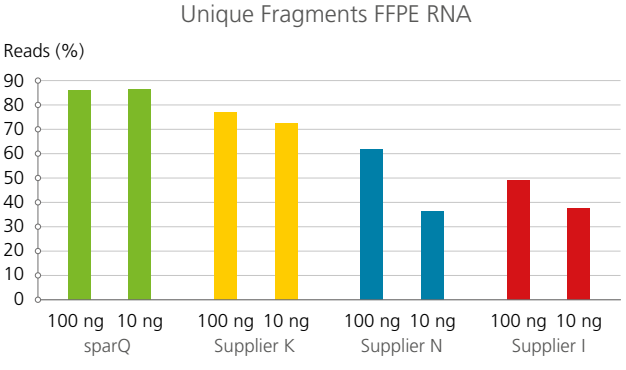


Figure 3 **Comparison of Unique Fragments.** The sparQ RNA-Seq HMR Kit consistently demonstrated higher rates of unique fragments indicating the highest library diversity regardless of RNA input quantity and sample type, which will enable more accurate quantification of low-level or rare transcripts and better transcript quantification.

sparQ DNA Frag & Library Prep Kit

Rapid DNA library prep with integrated enzymatic fragmentation

1 DNA Frag and Polishing

- One-step, tunable fragmentation size ranges for varying inputs
- Minimal fragmentation bias (comparable to mechanical shearing)

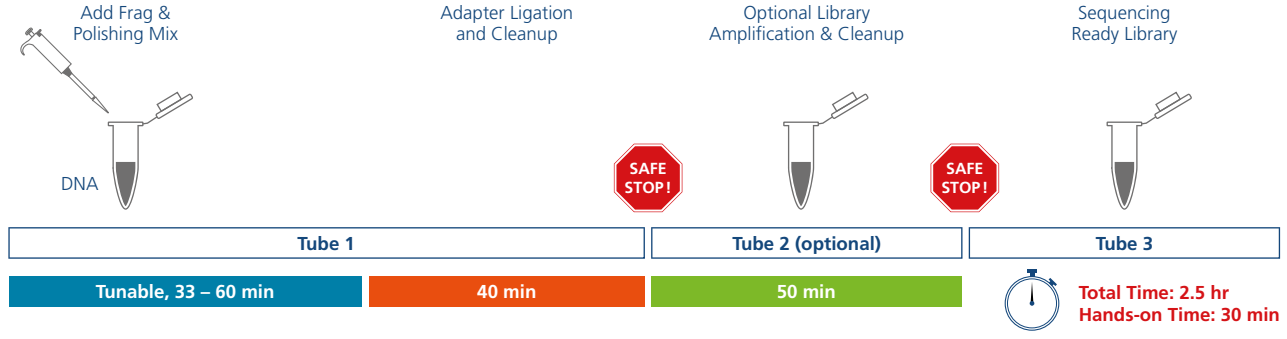
2 Adapter Ligation

- Streamlined workflow-proceed in same tube
- High efficiency ligation validated with various adapter types

3 PCR Amplification (optional)

- Superior HiFi amplification efficiency and uniform coverage
- Simple PCR master mix format

Streamlined Workflow (1 ng – 1 µg input DNA)



Tunable & reproducible fragmentation

Fragmentation Time Course

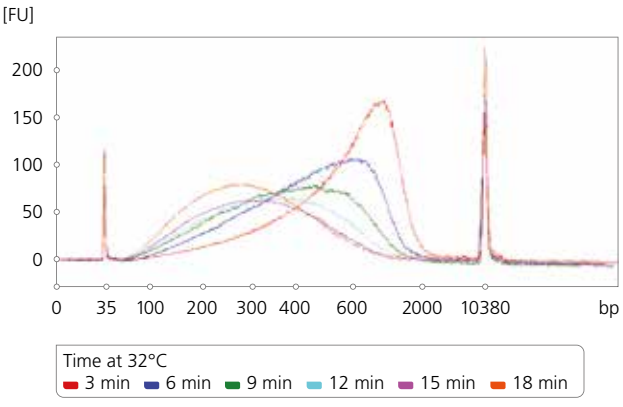


Figure 4 **sparQ DNA Frag & Library Prep Kit is tunable to the desired fragment size.** 100 ng human gDNA was subjected to fragmentation with a series of incubation time points (3 – 18 min). After fragmentation, DNA samples were purified and then visualized using an Agilent High Sensitivity DNA Kit.

Maximize coverage uniformity

Genome Coverage Analysis (1 ng input DNA)

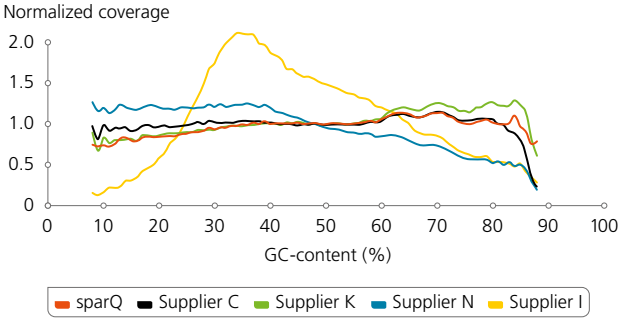


Figure 5 **Library prepared using sparQ DNA Frag & Library Prep Kit resulted in uniform coverage across a wide range of GC-content.** Libraries were prepared using different DNA fragmentation and library preparation kits with 1 ng of microbial genomic DNA followed by sequencing on Illumina MiSeq.

sparQ DNA Library Prep Kit

Streamlined, versatile single-tube solution for high quality library prep

1 DNA Polishing

- Combined DNA end-repair and dA-tailing
- Wide DNA input range
- Input sheared DNA, FFPE DNA, cfDNA or amplicons

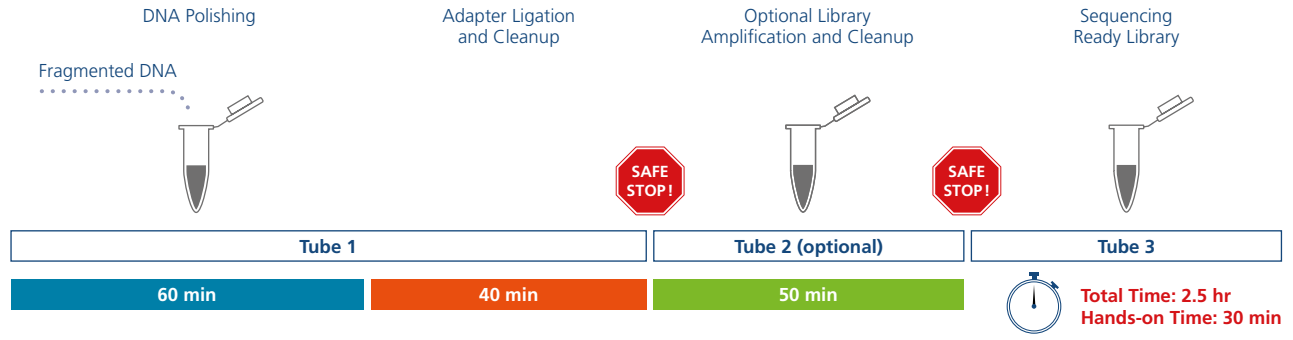
2 Adapter Ligation

- Streamlined workflow-proceed in same tube
- High efficiency ligation validated with various adapter types

3 PCR Amplification (optional)

- Superior HiFi amplification efficiency and uniform coverage
- Simple PCR master mix format

Streamlined Workflow (250 pg – 1 µg input DNA)



Maximize library yields

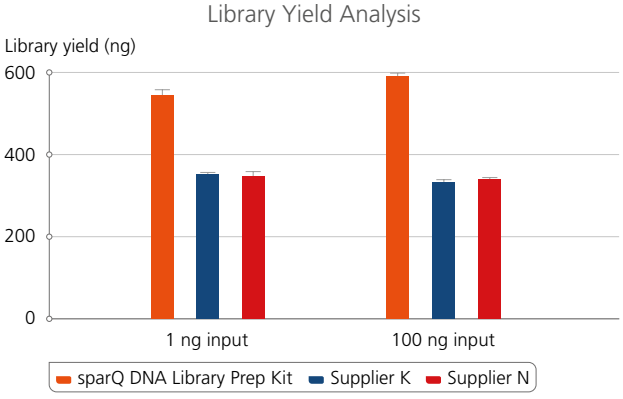


Figure 6 **sparQ DNA Library Prep Kit produces high quality libraries from a broad range of DNA inputs with significantly higher yields.** Libraries were prepared with Covaris-sheared human genomic DNA (250 bp average size) using kit manufacturers' instructions. Amplified libraries (6 PCR cycles for 100 ng input DNA and 13 PCR cycles for 1 ng input DNA) were quantified with Qubit® fluorometric method.

Consistent library prep efficiency

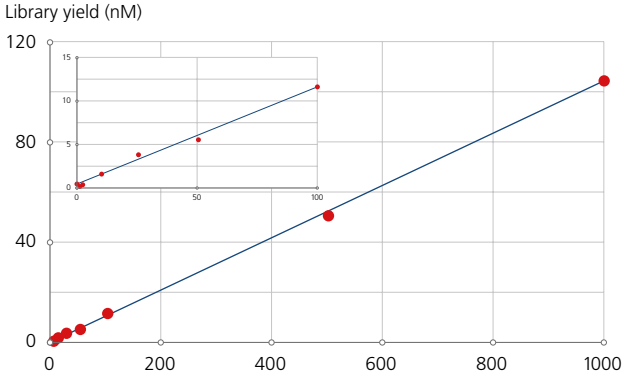


Figure 7 **sparQ DNA Library Prep Kit resulted in consistent library prep efficiency across a broad range of sample inputs.** Libraries were prepared from Covaris-sheared human genomic DNA with sparQ DNA Library Prep Kit without library amplification. Preamplified libraries were quantified with qPCR-based method.

sparQ HiFi PCR Master Mix

High-fidelity, high-efficiency library amplification

FEATURES AND BENEFITS:

- HiFi DNA polymerase engineered to minimize amplification bias
- Increased amplification efficiency resulting in higher yields
- Uniform coverage across challenging AT- and GC-rich regions
- Robust amplification from input DNA as low as 250 pg
- Cost-effective alternative to KAPA HiFi with improved performance

Superior amplification efficiency

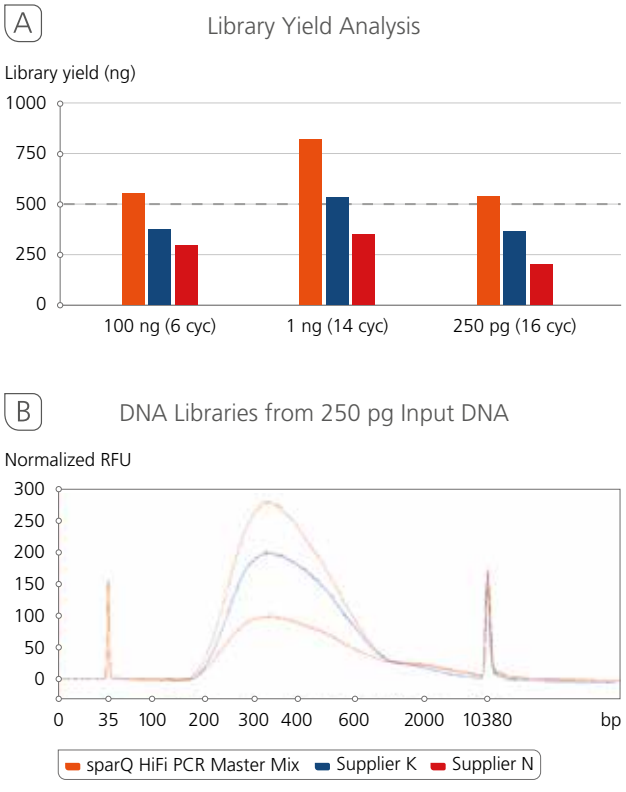


Figure 8 **Library amplification with sparQ HiFi PCR Master Mix resulted in higher yields.** Libraries were prepared from Covaris-sheared human genomic DNA with sparQ DNA Library Prep Kit prior to library amplification.
A Pre-amplified libraries were then amplified using sparQ HiFi PCR Master Mix (orange) or equivalent kit from Supplier K (blue) and Supplier N (red) with identical PCR cycle numbers. Amplified libraries were quantified with Qubit fluorometric method and qPCR-based quantification method (data not shown).
B The fragment size distribution and the quality of the amplified DNA libraries from 250 pg input DNA were analyzed using the Agilent BioAnalyzer.

Superior coverage uniformity

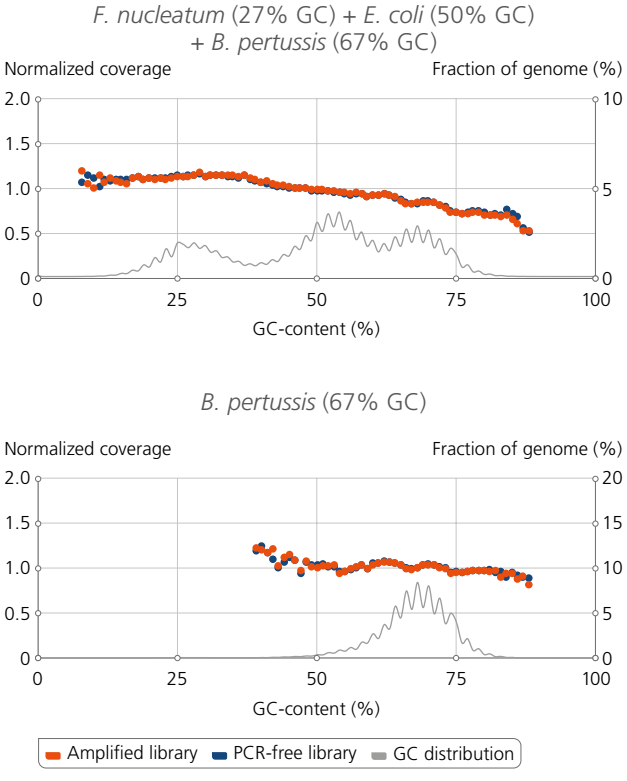


Figure 9 **Consistent coverage over a broad range of GC-content with sparQ HiFi PCR Master Mix.** Libraries amplified by sparQ HiFi PCR Master Mix (red) provide uniform GC coverage, similar to corresponding libraries without PCR (blue).

sparQ PureMag Beads

Fast, reliable nucleic acid purification & size selection for NGS workflows

FEATURES AND BENEFITS:

- High recovery of DNA and RNA fragments greater than 100 bp
- Efficient removal of unwanted reaction byproducts
- Consistent single or double-sided size selection
- Seamless integration into existing NGS workflows and automation friendly

Efficient recovery of DNA

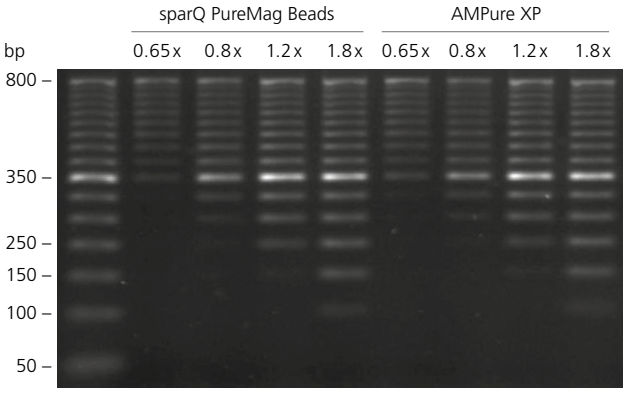


Figure 10 **sparQ PureMag Beads show equivalent performance to AMPure XP for DNA purification.** 50 bp DNA ladder was purified with sparQ PureMag Beads and AMPure XP at different beads to DNA ratios and analyzed on 2% agarose gel.

Equivalent Size Selection to SPRIselect

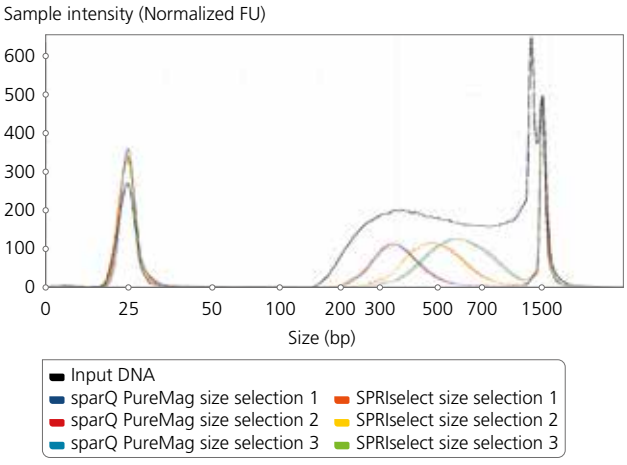


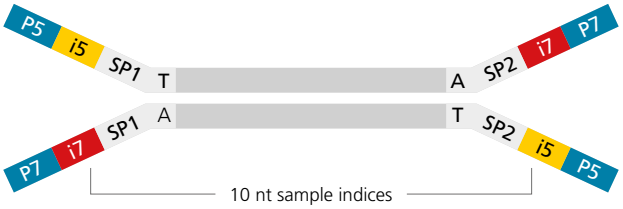
Figure 11 **sparQ PureMag Beads show equivalent performance to SPRIselect for size selection.** Fragmented DNA was size selected using different beads-to-sample ratios to select for fragment ranges: (1) 250-500 bp, (2) 450-600 bp or (3) 500-800 bp, using either sparQ PureMag Beads or SPRIselect. Peaks at 25 and 1500 bp represent low and high MW markers.

sparQ UDI Adapters

FEATURES AND BENEFITS:

- Flexible pooling: multiplex up to 96 samples per sequencing run
- Improved performance prevents index hopping and enhances demultiplexing accuracy
- Multiple applications including whole genome sequencing (with amplification or PCR-free), target enrichment, whole transcriptome sequencing and many more

Dual-indexed barcoded adapters for multiplexing up to 96 samples on Illumina instruments

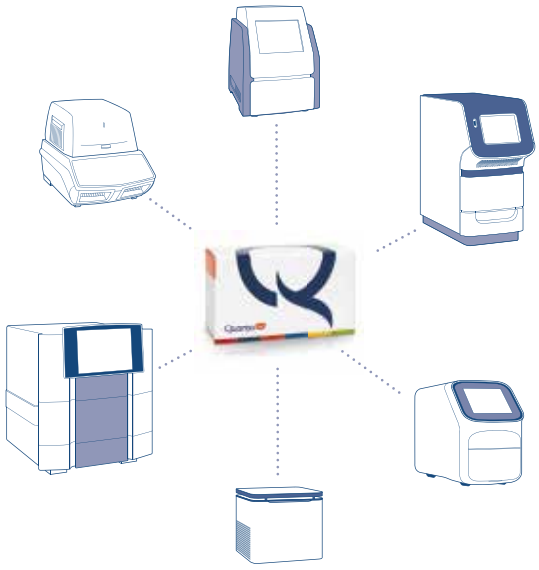


sparQ Universal Library Quant Kit

Fastest qPCR-based library quantification in 40 minutes

FEATURES & BENEFITS:

- 50% shorter run time than typical cycling protocols
- Accurate and reliable quantification of Illumina NGS libraries
- Exceptional quantitative sensitivity and reproducibility
- Stabilized, ready-to-use DNA standards for convenient use



Accurate library quantification in 40 minutes

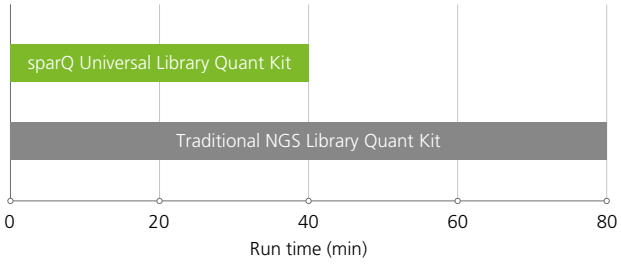


Figure 12 **Comparison of average qPCR run time for library quantification.** sparQ Universal Library Quant Kit uses a fast cycling protocol, allowing results to be achieved in 40 minutes versus 80 minutes with traditional NGS Library Quant Kit.

High amplification efficiency

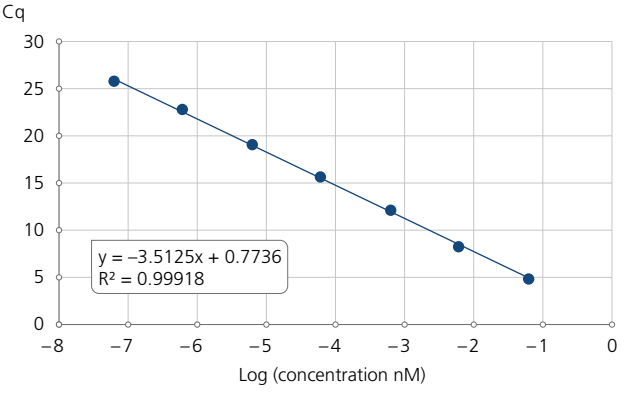


Figure 13 **sparQ Universal Library Quant Kit provides high amplification efficiency across a wide linear dynamic range.** A 10-fold dilution series was prepared and amplified under fast conditions on the Quantabio Q qPCR cycler using the sparQ Universal Fast Mastermix. The slopes of the Cq vs Log (concentration) plots indicated superb amplification efficiencies.

Equivalent performance to Kapa Library Quantification Kit

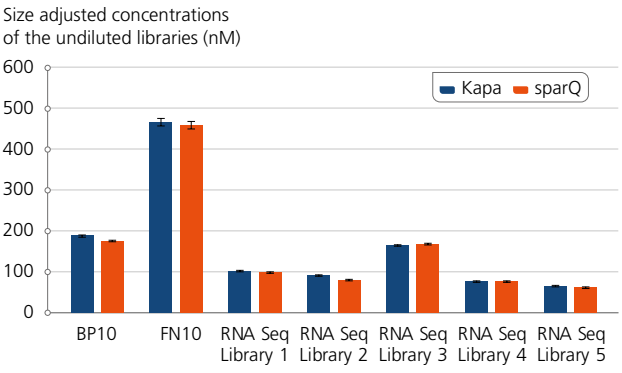


Figure 14 **Diverse libraries quantified using both sparQ Universal Library Quant Kit and Kapa™ Library Quantification Kit were highly comparable.** Seven libraries (2 DNA, 5 RNA) were prepared and each quantified according to each manufacturer's cycling protocol.

Ignite a sparQ in your NGS workflows

sparQ NGS Workflow Solutions

sparQ RNA-Seq HMR Kit
sparQ DNA Frag & Library Prep
sparQ DNA Library Prep
sparQ UDI Adapters

sparQ HiFi PCR Master Mix

sparQ PureMag Beads

sparQ Universal Library Quant Kit

Sample source	Sample type	Application
Human	gDNA/total RNA	Whole genome sequencing
Mouse	FFPE	Whole exome/targeted sequencing
Microbial	cfDNA	Transcriptome sequencing
Plant		Amplicon sequencing
		ChIP sequencing

ORDER INFO

Product Name	Quantabio Catalog Number	Size
sparQ RNA-Seq HMR Kit - 24 R	95216-024	24 rxns
sparQ RNA-Seq HMR Kit - 96 R	95216-096	96 rxns
sparQ DNA Frag & Library Prep Kit - 24	95194-024	24 rxns
sparQ DNA Frag & Library Prep Kit - 96	95194-096	96 rxns
sparQ DNA Library Prep Kit - 24	95191-024	24 rxns
sparQ DNA Library Prep Kit - 96	95191-096	96 rxns
sparQ HiFi PCR Master Mix	95192-050	50 rxns (1 x 1.25 ml)
sparQ HiFi PCR Master Mix	95192-250	250 rxns (5 x 1.25 ml)
sparQ PureMag Beads - 5 ml	95196-005	5 ml
sparQ PureMag Beads - 60 ml	95196-060	60 ml
sparQ PureMag Beads - 450 ml	95196-450	450 ml
sparQ Universal Library Quant Kit - 100 R	95210-100	100 rxns
sparQ Universal Library Quant Kit - 500 R	95210-500	500 rxns
sparQ UDI Adapters (1-96)	95211-096	1-96 UDI Adapters

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