

AAAAAAGGGGGG

Ignite better insights

RNA & DNA  
Sequencing  
Solutions

# sparQ NGS Product Guide

For Illumina® Sequencers

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

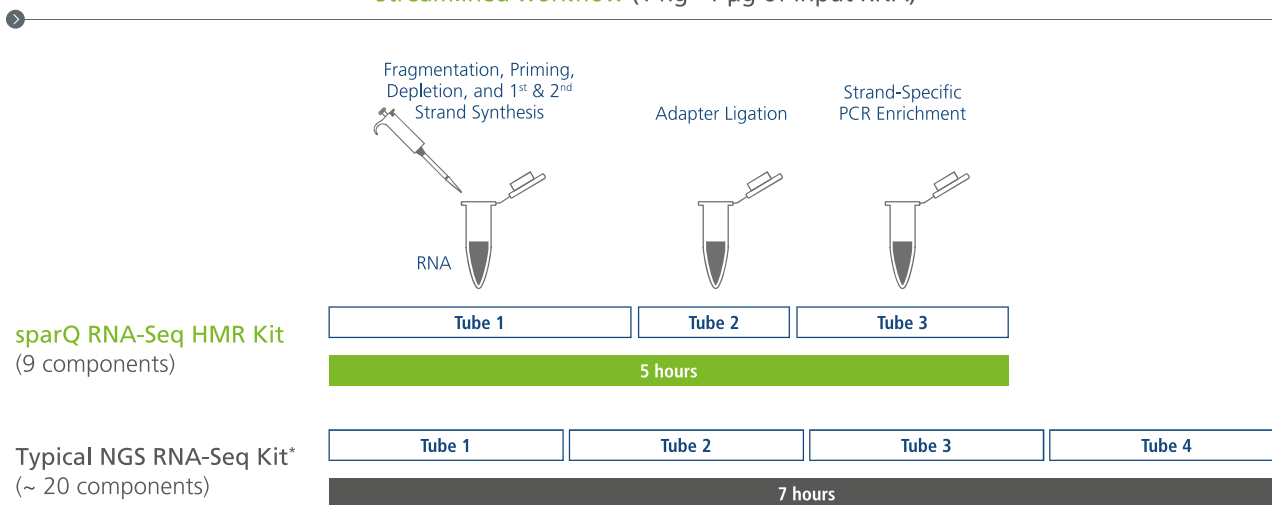
## sparQ RNA-Seq HMR Kit

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

#### FEATURES & BENEFITS:

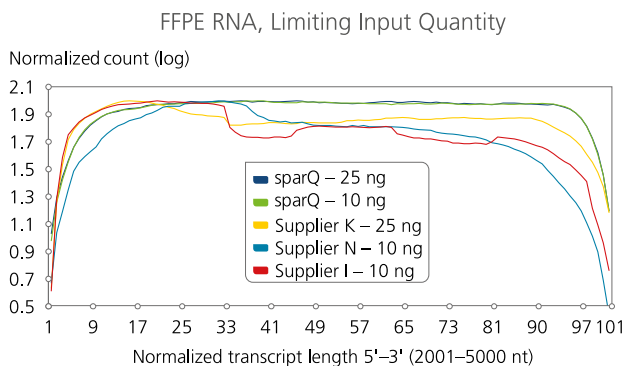
- High quality directional RNA library prep in 5 hours
- Simple workflow with 3 reaction tubes, 9 steps and 9 components
- Efficient and integrated removal of rRNA and globin mRNA from human/mouse/rat (HMR) samples
- Improved results for samples with limited quantity and/or poor quality RNA

#### Streamlined workflow (1 ng – 1 µg of input RNA)



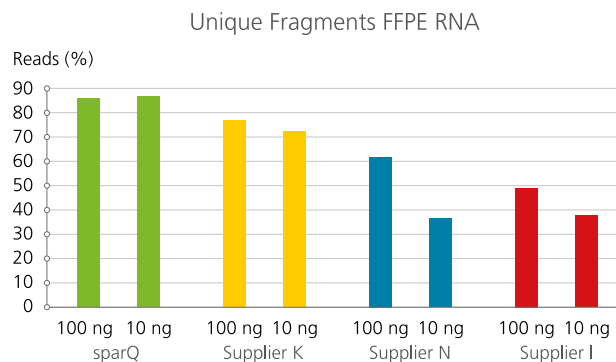
**Figure 1** sparQ RNA-Seq HMR Kit workflow is simplified to 3 reaction tubes, 9 steps and 9 components. rRNA and globin mRNA removal is integrated with the RNA fragmentation and priming step, enabling faster time to result, less hands-on time and fewer pipetting steps.

#### 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)

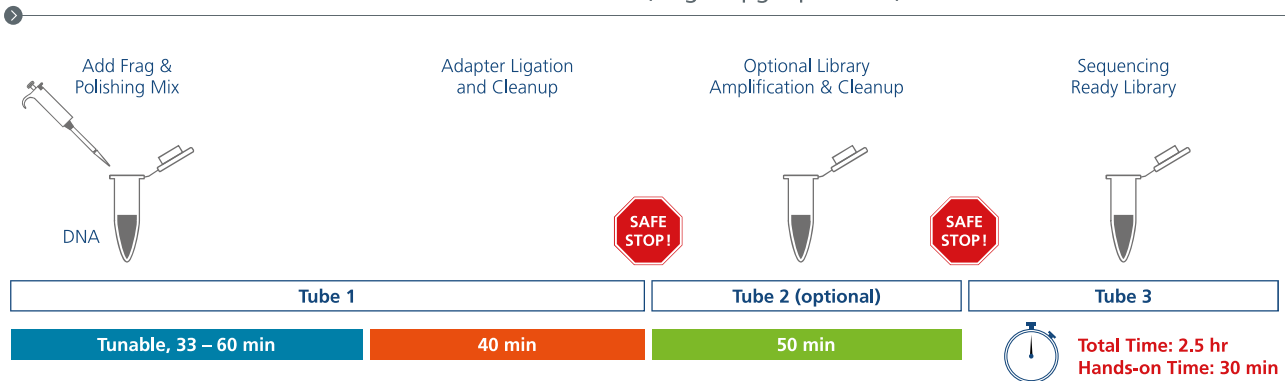
### 2 Adapter Ligation

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

### 3 PCR Amplification (optional)

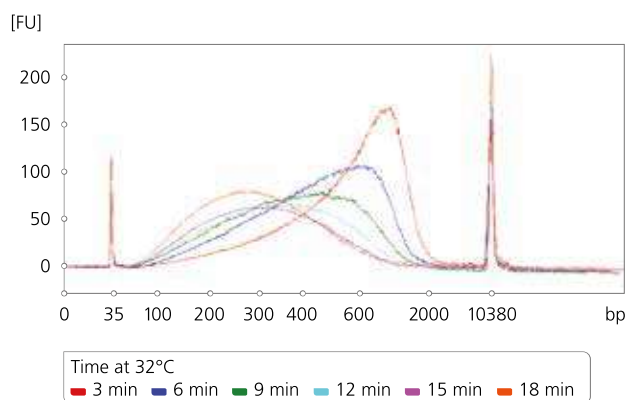
- Superior HiFi amplification efficiency and uniform coverage
- Simple PCR master mix format

### Streamlined Workflow (1 ng – 1 µg input DNA)



### Tunable & reproducible fragmentation

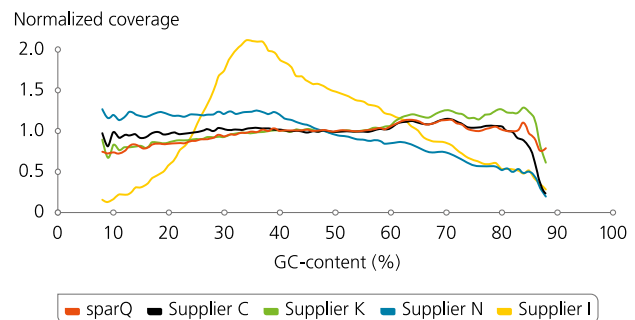
Fragmentation Time Course



**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

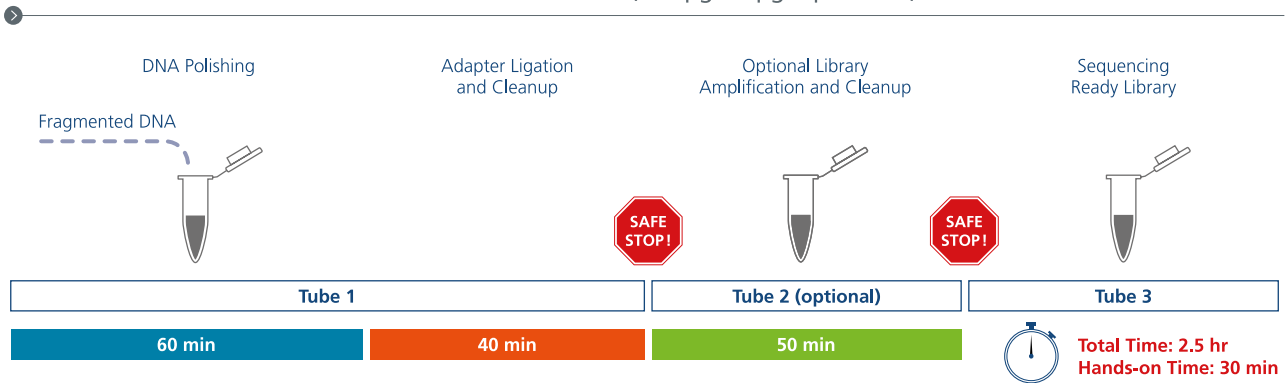
### 2 Adapter Ligation

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

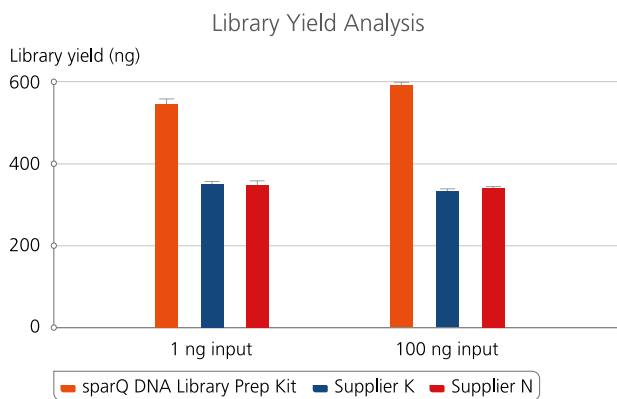
### 3 PCR Amplification (optional)

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

### Streamlined Workflow (250 pg – 1 µg input DNA)

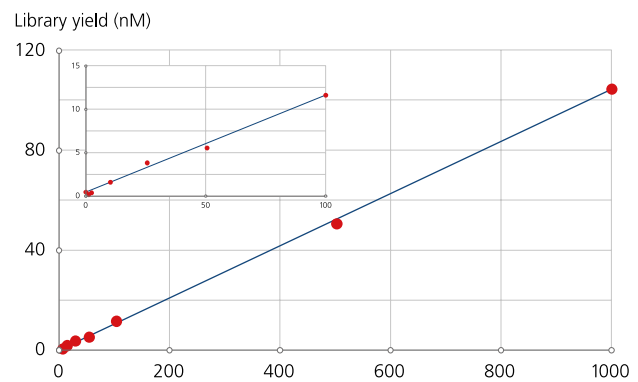


### Maximize library yields



**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. Pre-amplified libraries were quantified with qPCR-based method.

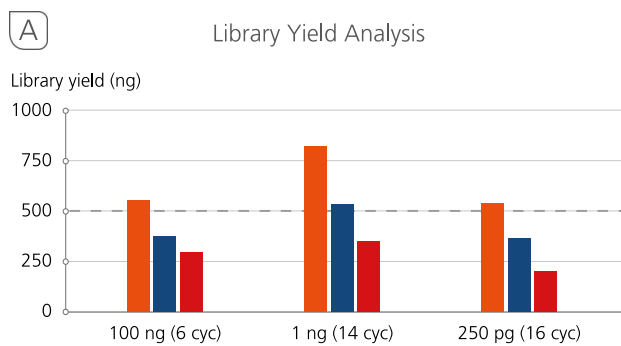
# sparQ HiFi PCR Master Mix

## High-fidelity, high-efficiency library amplification

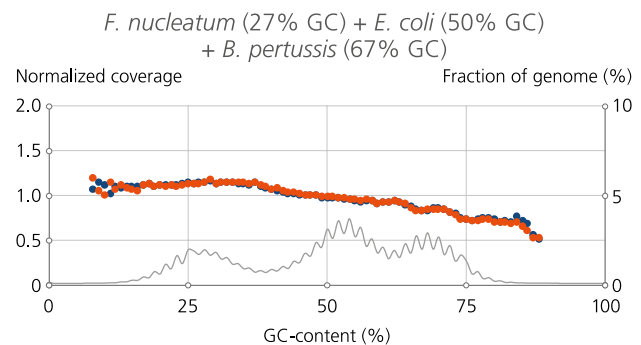
### FEATURES AND BENEFITS:

- 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

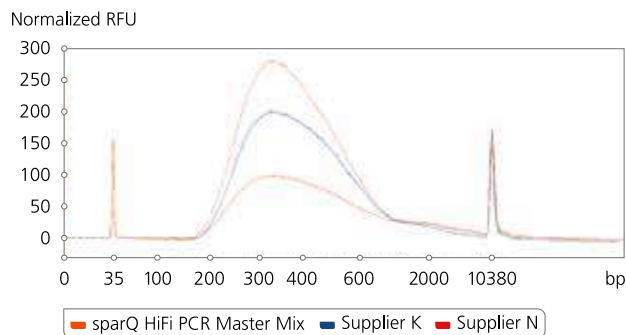
### Superior amplification efficiency



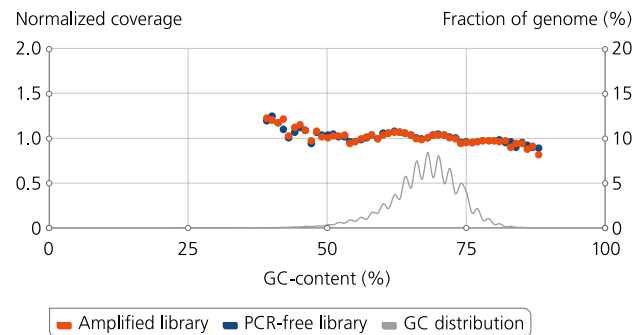
### Superior coverage uniformity



### **B** DNA Libraries from 250 pg Input DNA



### *B. pertussis* (67% GC)



**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.

**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).

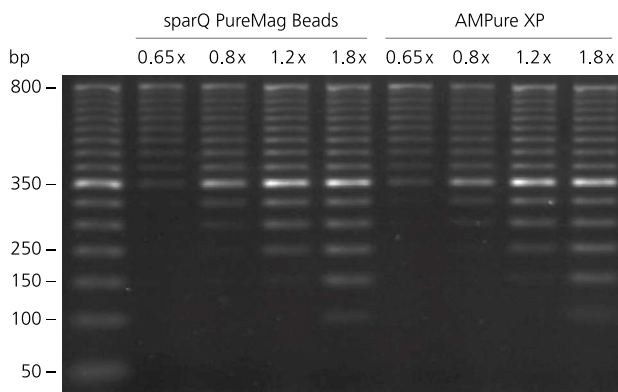
## sparQ PureMag Beads

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

### FEATURES AND BENEFITS:

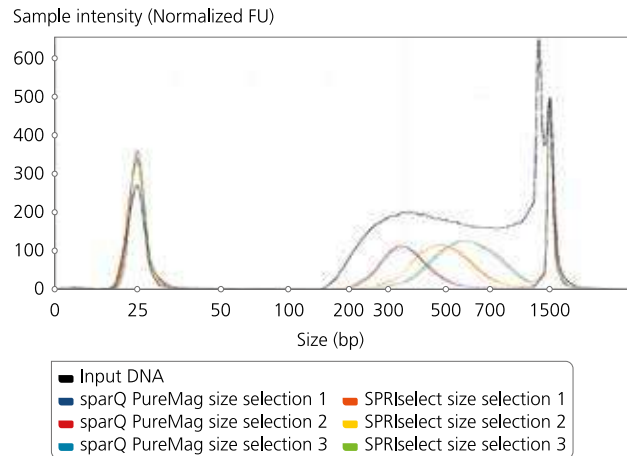
- High recovery of DNA and RNA fragments greater than 100 bp
- Efficient removal of unwanted reaction byproducts
- Consistent single or double-sided size selection
- Seamless integration into existing NGS workflows and automation friendly

#### 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



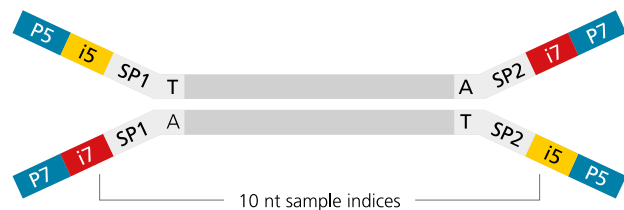
**Figure 11** sparQ PureMag Beads show equivalent performance to SPRIselect for size selection. Fragmented DNA was size selected using different beads-to-sample ratios to select for fragment ranges: (1) 250-500 bp, (2) 450-600 bp or (3) 500-800 bp, using either sparQ PureMag Beads or SPRIselect. Peaks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

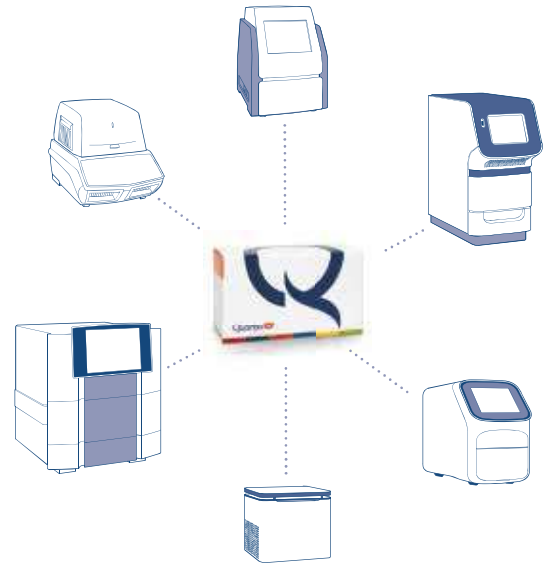


# sparQ Universal Library Quant Kit

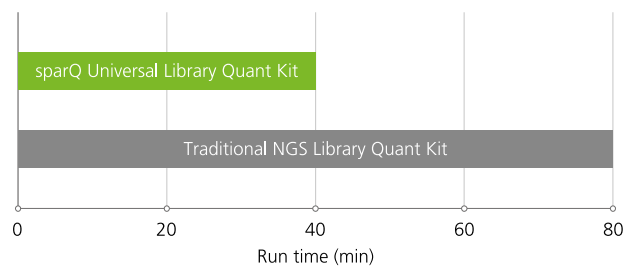
Fastest qPCR-based library quantification in 40 minutes

## 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

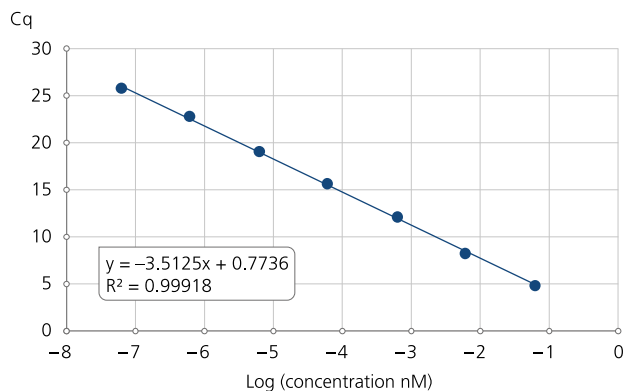


Accurate library quantification in 40 minutes



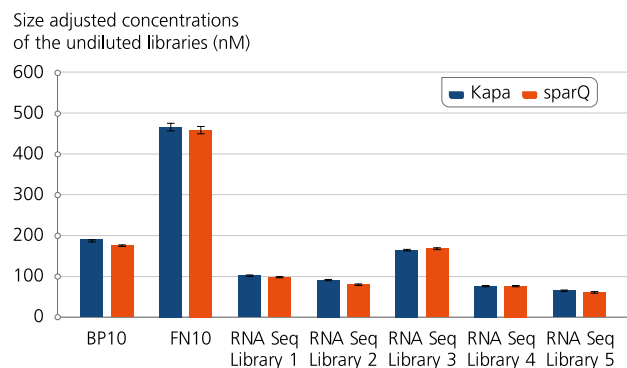
**Figure 12** Comparison of average qPCR run time for library quantification. sparQ Universal Library Quant Kit uses a fast cycling protocol, allowing results to be achieved in 40 minutes versus 80 minutes with traditional NGS Library Quant Kit.

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 cyclers 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

#### Library Preparation



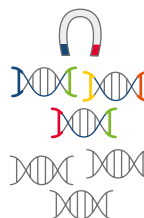
sparQ RNA-Seq HMR Kit  
sparQ DNA Frag & Library Prep  
sparQ DNA Library Prep  
sparQ UDI Adapters

#### HiFi Amplification



sparQ HiFi PCR Master Mix

#### CleanUp & Size Selection



sparQ PureMag Beads

#### Library Quantification



sparQ Universal Library Quant Kit

| Sample source  | Sample type   | Application  |
|--|---|--|
| <ul style="list-style-type: none"> <li>Human</li> <li>Mouse</li> <li>Microbial</li> <li>Plant</li> </ul> | <ul style="list-style-type: none"> <li>gDNA/total RNA</li> <li>FFPE</li> <li>cfDNA</li> </ul> | <ul style="list-style-type: none"> <li>Whole genome sequencing</li> <li>Whole exome/targeted sequencing</li> <li>Transcriptome sequencing</li> <li>Amplicon sequencing</li> <li>ChIP sequencing</li> </ul> |

### 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      |

Trademarks: Illumina® is a registered trademark of Illumina, Inc. Qubit® is a registered trademark of Thermo Fisher Scientific and its subsidiaries. Quantabio products are intended for molecular biology applications. The products are not intended for the diagnosis, prevention or treatment of a disease. MK-SF-0043 REV 01 sparQ NGS Product Guide 0322



**Avantor Performance Materials India Private Ltd.**  
19<sup>th</sup> Floor, Building No. 5 - Tower C  
DLF Cyber City, Phase - III, Gurgaon - 122002 Haryana  
t +91 124 4656700  
product.info@avantorsciences.com

**Avantor Performance Materials India Private Ltd.**  
5th Floor, Tiffany building, Hiranandani Business Park  
Thane (W), Mumbai - 400607  
t +91-22-41288100  
product.info@avantorsciences.com

Scan and Explore



in.vwr.com