

KAPA EvoPrep Kit

Simplify high-performance library prep from mechanically fragmented DNA & cfDNA



Achieve high-performing NGS library preparation from mechanically fragmented DNA or cell-free DNA (cfDNA) in a streamlined, automation-friendly workflow with **KAPA EvoPrep Kit**. The KAPA EvoPrep workflow reduces pipetting and reagent preparation steps, and is validated with challenging sample inputs such as cfDNA & FFPET DNA.

KAPA EvoPrep Kit is the next evolution of Roche DNA Library Preparation portfolio, delivering unparalleled convenience for whole-genome sequencing (WGS), whole-exome sequencing (WES) & targeted sequencing applications-including cfDNA applications.

- Increase efficiency & convenience with automation-friendly ReadyMix reagents & new KAPA EvoT4 ligase, in plated format or in tubes
- Achieve higher yields & greater library conversion efficiency across a range of sample types and DNA inputs as low as 100 pg
- Reduce sequencing artifacts & coverage bias
- Improve performance with challenging sample types such as cfDNA
- Cover regions of interest with depth & accuracy in target enrichment workflows



Increase efficiency & convenience

- Analyze a greater variety of samples with a wide range of DNA inputs (0.1 ng-500 ng)
- Reduce hands-on-time & the number of reagent tubes with ReadyMix formulations, available in tubes or automation-friendly plates
- Shorten workflow time without compromising results with a 5-minute ligation time





Figure 1: KAPA EvoPrep ReadyMix reagents are ready-to-use; no master mix preparation is required. NOTES: KAPA full-length UDI adapters are only available in 96-well plates. KAPA Universal Adapters, which are used in combination with KAPA UDI Primer Mixes and require amplification, are available in plates or tubes. KAPA HyperPure Beads, UDI Adapter Kits & KAPA Library Amplification Primer Mix (10X) are sold separately.

Achieve higher yields & greater library conversion efficiency

- Reduce duplication rates while increasing sequencing coverage, with fewer amplification cycles needed for downstream processing
- Achieve successful library construction with clinically relevant samples & PCR-free workflows from as little as 50 ng



Figure 2: KAPA EvoPrep chemistry enables high library conversion across a range of input DNA. 0.1 ng - 500 ng of Covaris-sheared human genomic DNA was used to prepare libraries with KAPA Universal Adapters (with KAPA UDI Primer Mixes) at the recommended adapter: insert molar ratio following the KAPA EvoPrep and KAPA HyperPrep Kit Instructions for Use. Data bars represent the mean, and error bars represent standard deviation (n=4).⁺ Non-validated input (outside of the input range) for KAPA HyperPrep Kit optimized cycle number for KAPA EvoPrep Kit inputs used.

Reduce sequencing artifacts & coverage bias

- Improve your sequencing metrics with reduced artifacts, allowing higher confidence in your data
- Minimize coverage bias, increasing uniformity of coverage & potentially decreasing sequencing costs



Figure 3: KAPA EvoPrep Kit yields uniform coverage with reduction in sequencing artifacts. PCR-free whole genome libraries were prepared using 100 ng of Covarissheared human genomic DNA (NA12878) with the KAPA EvoPrep Kit, Supplier Q & Supplier W, following each supplier's instructions for use. (A) The KAPA EvoPrep Kit had the lowest percentage of Chimeras present. (B) The percentage of SSARs present in data generated with the KAPA EvoPrep Kit was equivalent to Supplier Q, with Supplier W having the highest percentage of SSARs present. SSARs represent chimeric reads that appear to be derived from non-contiguous portions of the genome.³ (C) The KAPA EvoPrep Kit had uniform coverage and low AT- or GC-bias while Supplier Q had lumpy coverage and coverage hotspots i.e., over-representation of AT- rich region. This could require more sequencing to be performed to achieve the requisite coverage for these regions, which increases cost and turnaround times. (D) KAPA EvoPrep Kit had very low duplication count compared to Supplier Q & Supplier W, thereby having more unique library molecules present.¹ All libraries were sequenced on an Illumina NovaSeq 6000 (2x150bp) & subsampled to 150 M reads.

Improve performance with challenging sample types such as cfDNA

- Generate more diverse libraries from challenging sample types such as cfDNA
- Increase confidence in data due to reduction in sequencing artifacts





Figure 4: KAPA EvoPrep Kit yields a high number of unique library molecules, with fewer chimeric reads. Whole genome sequencing libraries were prepared using 10 ng of cfDNA with the KAPA EvoPrep Kit, Supplier N, Supplier Q, Supplier T & Supplier W, following each supplier's instructions for use. KAPA EvoPrep Kit generated a higher number of unique library molecules compared to Supplier N, Supplier Q, Supplier T & Supplier W, resulting in higher library diversity & data confidence.¹ The KAPA EvoPrep Kit generated a low percentage of Chimeras present, resulting in higher data confidence.² with Supplier N, Supplier Q & Supplier W generating a higher percentage of Chimeras present. All libraries were sequenced on an Illumina NovaSeq 6000 (2x150bp) & subsampled to 150 M reads.

Cover regions of interest with depth & accuracy in target enrichment workflows

- Achieve high specificity with the highest percent of target coverage at ≥1000x
- Combine high uniformity & high recovery of unique molecules





Figure 5: KAPA EvoPrep Kits yield improved sequencing performance in target capture workflows utilizing cfDNA. 10 ng of cfDNA was used to prepare triplicate libraries with the KAPA EvoPrep Kit, Supplier N, Supplier Q, Supplier T & Supplier W, following each supplier's instructions for use. Libraries were enriched with the KAPA HyperCap Oncology Panel (214 Kb), following the KAPA HyperCap cfDNA Evolved workflow instructions. The KAPA EvoPrep Kit had the highest percentage of target coverage at ≥1000X compared to other suppliers; the highest percentage of coverage uniformity compared to other suppliers, thereby showcasing the optimal utilization of sequencing throughput by higher uniformity; as well as higher unique molecule recovery compared to Supplier N, Supplier Q, Supplier T & Supplier W, resulting in higher data confidence.¹ All libraries were sequenced on an Illumina NovaSeq 6000 (2x150bp) and subsampled to 150 M reads.

KAPA EvoPrep Kits

Roche Cat. No.	Description
10154039001	KAPA EvoPrep Kit (24rxn)
10096039001	KAPA EvoPrep Kit (96rxn)
10153849001	KAPA EvoPrep Kit (384rxn)
10153865001	KAPA EvoPrep Kit, plated format (96rxn)
10153806001*	KAPA EvoPrep Kit, PCR-free (24rxn)
10153814001*	KAPA EvoPrep Kit, PCR-free (96rxn)
10153857001*	KAPA EvoPrep Kit, PCR-free (384rxn)
10154284001*	KAPA EvoPrep Kit, PCR-free, plated format (96rxn)

*KAPA Library Amplification Primer Mix (10X) not included.

KAPA HiFi Hot Start Ready Mixes

Roche Cat. No.	Description
09420398001	KAPA HiFi HS RM (9.6ml)
09420444001	KAPA HiFi HS RM 96 well plate (96rxn)

KAPA EvoPrep V2 Kits + KAPA Library Amplification Mix

Roche Cat. No.	Description
10212233702**	KAPA EvoPrep Kit + Lib Amp Primers (24rxn)
10212250702**	KAPA EvoPrep Kit + Lib Amp Primers (96rxn)
10212268702**	KAPA EvoPrep Kit + Lib Amp Primers (384rxn)
10212276702**	KAPA EvoPrep Kit+Lib Amp Primers 96plate
**Combined Virtual kits. Or	der one catalog number & receive both items

KAPA Library Amplification Mixes		
Roche Cat. No.	Description	
09420410001	KAPA Library Amp Primer Mix (384 rxn)	
09420479001	KAPA Library Amp Primer Mix 96-well plate (96rxn)	

1. McNulty et al. Impact of reducing DNA input on next-generation sequencing library complexity and variant detection. The journal of Molecular Diagnostics, Volume 22, Issue 5, May 2020, Pages 720-727.

2. Chen et al. Characterization and mitigation of artifacts derived from NGS library preparation due to structure-specific sequences in the human genome. BMC Genomics (2024) 25:227.

3. Haile, et al. (2019). Sources of erroneous sequences and artifact chimeric reads in next generation sequencing of genomic DNA from formalin-fixed paraffin-embedded samples. Nucleic Acids Research, 2019, 7,2. doi: 10.1093/nar/gky1142.

Walk through your library prep goals with an expert today, & learn more at **go.roche.com/EvoPrepKits**

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