

Twist FlexPrep™ UHT Pure Ag DNA LP Kit

Streamlined DNA purification and library preparation optimized for agrigenomic workflows

Accurate NGS data begins with efficient and reproducible DNA purification and library preparation. For agricultural genomics, where sample input quality and composition can vary significantly, a validated extraction and library preparation method is critical to maintain data integrity and downstream performance. The Twist FlexPrep UHT Pure Ag DNA LP Kit offers a complete NGS alternative to array-based technologies for agrigenomics and other ultra-high throughput applications. It consists of DNA purification and library preparation modules, with options available for additional target enrichment (**Figure 1**).

The Twist DNA Purification Kit module is a simple, easy-to-use kit that consistently extracts the maximum amount of high-quality DNA from a variety of materials, including plant and animal tissue samples. It is compatible with a variety of source qualities and types, including fresh, frozen, dried, or otherwise stabilized. DNA extraction with this module only requires a single purification step, minimizing the number of centrifugation and wash steps required, thereby reducing processing time compared with other DNA extraction methods on the market. Also, with only one purification step, fewer materials are used and plastic waste is minimized. In addition to high efficiency and yield, the kit ensures that the extracted DNA will be of high purity and quality.

The Twist FlexPrep UHT Library Preparation Module is an innovative kit that removes typical throughput challenges facing NGS workflows. By combining Twist's Normalization by Ligation™ (NBL) technology with gold-standard enzymatic fragmentation methods, this kit offers built-in sample normalization across a wide range of DNA inputs, reducing both cost and complexity of typical sample processing steps prior to library preparation. Early sample barcoding with up to 12 inline barcodes included on the FlexPrep normalization adapters enables downstream pooling of 12 separate samples into one reaction for a more efficient and high-throughput workflow. With this library preparation module, sequencing throughput can be maximized by running up to 1,152 samples in a single sequencing run from one kit. This increased efficiency can translate to cost and consumables savings. For additional details on this library preparation module, please refer to the [Twist FlexPrep UHT Library Preparation Kit product sheet](#).

KEY BENEFITS

DNA purification involves an innovative single-step extraction method

- Streamlined extraction workflow minimizes steps and reduces the risk of error
- Reduces the amount of plastic waste compared to bind-wash-elute methods
- Consistently extracts large yields of high-quality and high-purity gDNA
- Compatible with 96-well plates for high-throughput processing
- Suitable for fresh, frozen, stabilized, and other challenging sample types from plant and animal tissues

Efficient and high-throughput library preparation with Normalization by Ligation (NBL) technology and inline barcodes

- Eliminate upfront normalization
- No need for intermediate quantitation
- Pool 96 samples into eight tubes after the ligation reaction
- Uniquely index up to 1,152 samples from a single kit



Figure 1. Twist FlexPrep UHT Pure Ag DNA LP Kit enables sample preparation and library preparation, with options for target enrichment.

Streamlined workflow for DNA extraction from challenging samples

The Twist DNA Purification Kit workflow is highly streamlined and is characterized by a single-step purification technology that minimizes extraction time while maintaining consistent and high-quality results. After lysis, the lysate is transferred through a matrix that binds only to unwanted components and allows nucleic acids to pass through freely (Figure 2). This purification process is a quick and easy-to-handle single step that requires no additional washes.

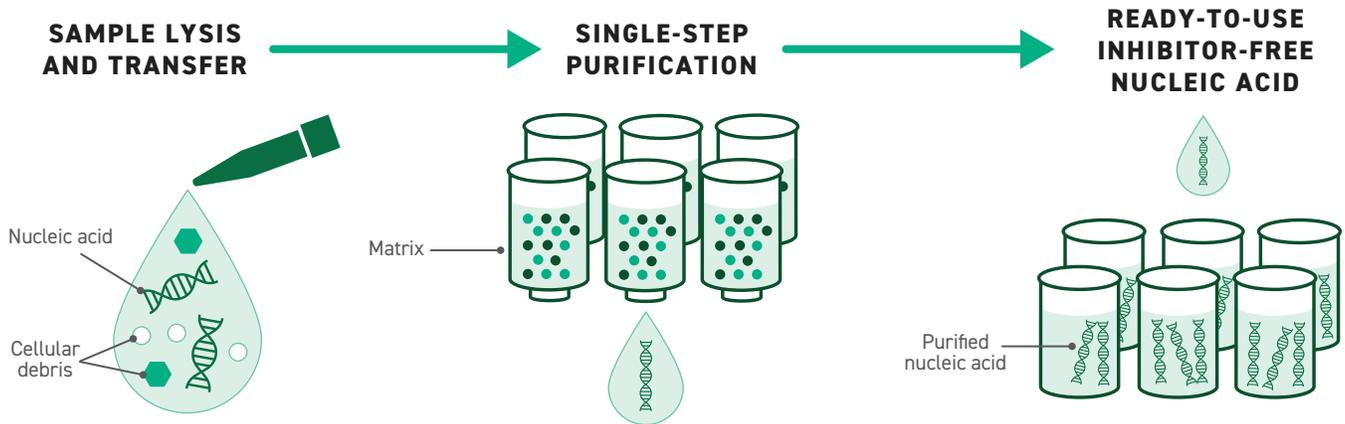


Figure 2. Schematic of Twist DNA Purification Kit workflow. DNA source material first undergoes lysis. The resulting lysate is then passed through a matrix that captures cell debris and contaminants. This one-step purification process requires no additional wash steps nor the use of ethanol. Finally, purified nucleic acid is collected in the flow-through and is ready for further downstream processing with the Twist FlexPrep UHT Library Preparation Module.

Robust DNA yield and quality from common agricultural samples

The Twist DNA Purification Kit enables the purification of high-quality gDNA that is of sufficient purity and concentration for library preparation. This kit yields high DNA concentration (~50 ng/μl) appropriate for the enzymatic fragmentation step used to prepare libraries with the Twist FlexPrep UHT Library Preparation Module (Figure 3A). No significant shearing of gDNA occurs during the purification step, as DNA size is 31,419 bp on average (Figure 3B). Importantly, the kit successfully removes contaminants, with both A260/A280 and A260/A230 ratios being >1.8. This ensures that the enzymatic steps involved in library preparation for NGS are not inhibited (Figures 3C and 3D).

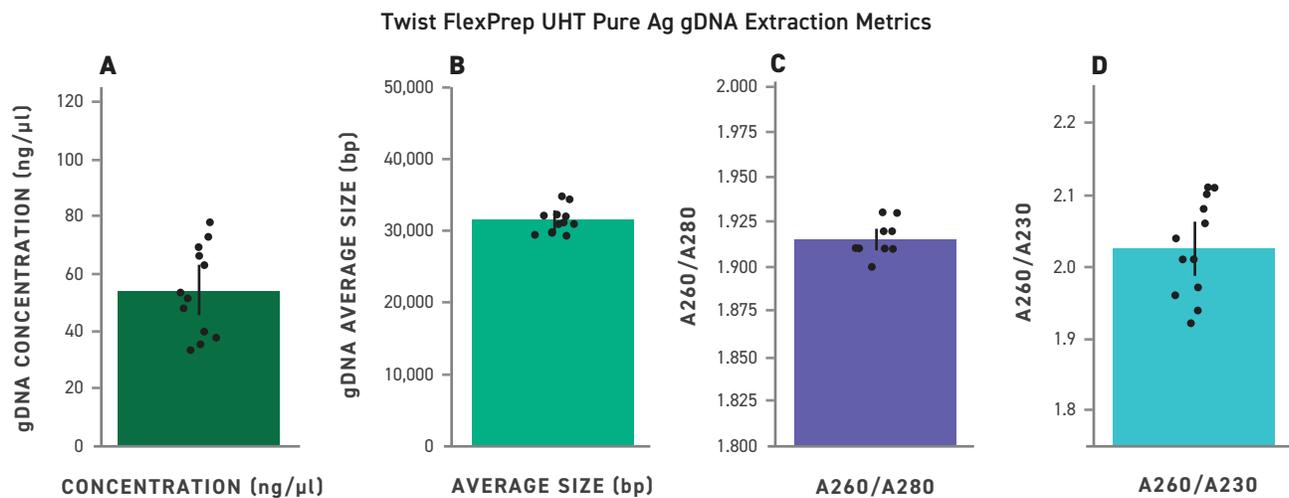


Figure 3. gDNA extraction metrics from 12 samples prepared using Twist DNA Purification Kit. Replicates are n = 12, with individual samples shown as overlain dots. Allflex Tissue Sampling Units (TSUs) were used to collect tissue samples from frozen bovine ears. Lysis was performed with bead beating for 2 hours at 60°C with shaking every 30 minutes (2000 rpm for 1 minute). (A) gDNA concentration as measured by Broad Range dsDNA Qubit Assay. (B) Average size as measured by Genomic DNA ScreenTape assay; average size of fragments was between 100 bp and 60,000 bp. NanoDrop absorbance ratios of (C) A260/A280 and (D) A260/A230 for extracted gDNA samples.

Effective and efficient library preparation and sequencing

gDNA that has been isolated using the Twist DNA Purification Kit is suitable for direct use with the Twist FlexPrep UHT Library Preparation Module. The Twist FlexPrep UHT Library Preparation Module produces library yields sufficient for whole genome sequencing or target enrichment protocols (**Figure 4A**). After sequencing, libraries have the desired median insert size of 210 bp on average (**Figure 4B**) and normalization is maintained. The 12 libraries in a FlexPrep library pool had an average CV of 0.19 (**Figure 4C**) and an S-metric <1.6 (**Figure 4D**). Overall, the Twist FlexPrep UHT Pure Ag DNA LP Kit successfully isolates high-quality gDNA and generates DNA libraries suitable for further target enrichment or sequencing. Ultimately, this ensures that high-quality NGS data and genomic insights can be obtained.

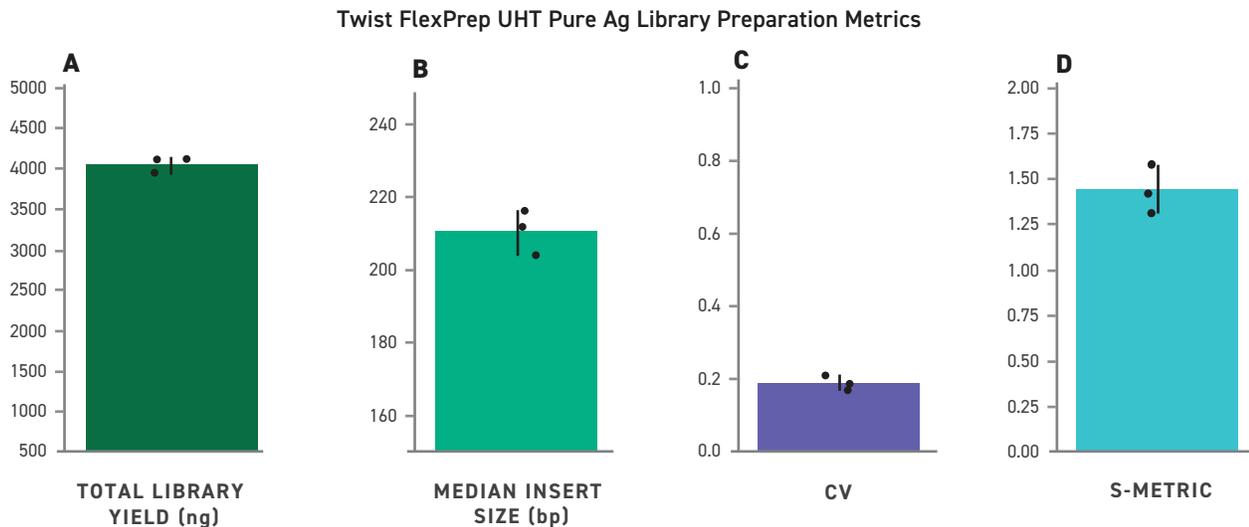


Figure 4. Library preparation and sequencing metrics from three pools of 12 samples prepared using the Twist FlexPrep UHT Pure Ag LP Kit. For each sample, 4 μ l of gDNA purified using Twist DNA Purification Kit was used as input into library preparation, skipping DNA normalization. Thirty-six total samples were processed for three total FlexPrep library pools. Library pools were then sequenced with an Illumina NextSeq 550. (A) Total library yield as measured by Broad Range dsDNA Qubit Assay. (B) Median insert size of the NGS library from sequencing. (C) CV of read counts from the 12 barcoded libraries in a FlexPrep library pool. (D) Normalization as measured by S-metric. S-metric is the mean of the read counts from each library in the pool of 12 divided by the minimum of the read counts from each library in the pool of 12; it measures how much relative sequencing is needed to catch up the least sequenced library with the mean sequencing depth of the pool. For additional details on the S-metric, please refer to the Twist FlexPrep UHT Library Preparation Kit product sheet.

LEARN MORE

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ORDERING INFORMATION

127857: Twist FlexPrep UHT Pure Ag DNA LP Kit, 192 Samples
127858: Twist FlexPrep UHT Pure Ag DNA LP and Hyb Kit, 192 Samples
127859: Twist FlexPrep UHT Pure Ag DNA LP Kit, 1152 Samples
127861: Twist FlexPrep UHT Pure Ag DNA LP and Hyb Kit, 1152 Samples