TWIST FOR ELEMENT

Twist Exome Workflow Solutions for Element Biosciences' AVITI™ Platform featuring Exome 2.0 Plus Comprehensive Exome Spike-in

KEY BENEFITS

- Utilize Twist library preparation to generate high-quality libraries compatible with the AVITI sequencing system without the need for library conversion
- All-in-one, simplified workflow including fragmentation, library preparation, indexing, and target enrichment
- Includes our most popular Exome 2.0 + Comprehensive Spike-in panel which provides coverage of relevant genes found in major clinical databases
- Convenient workflows that are compatible with Element Trinity Workflows and reduce hybridization time to just one hour

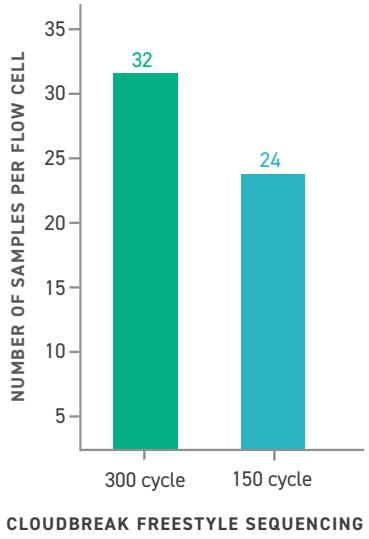
User-friendly solution to human exome sequencing for generation and enrichment of NGS libraries compatible with the AVITI platform. Element Bioscience's AVITI platform offers high-quality sequencing with the advantages of a flexible platform routinely achieving >90% of reads scoring >Q30[1,2]. The AVITI platform offers dual independent flow cells for flexibility in run configuration and throughput to suit the particular needs of a laboratory. This allows laboratories to avoid batching samples, which reduces costs. Additionally, with the use of Element's Cloudbreak™ or Cloudbreak Freestyle chemistry, users can save time by eliminating the need to convert linear libraries to circularized libraries.

Twist Bioscience now offers a complete native exome enrichment workflow which includes our most complete and inclusive exome panel paired with our high-performing library preparation and enrichment reagents for a complete solution to go from sample to sequencing on the AVITI platform. Twist Bioscience also offers support for Element Trinity workflows with Twist Standard Hybridization and Fast Hybridization buffer systems that reduce hands-on time. These workflows also incorporate adapters designed to be coupled with Element's Cloudbreak Freestyle sequencing chemistry. They also enable users to customize content by spiking their own content to the exome panel or customizing enrichment with entirely custom panels. Twist Bioscience's workflow solutions for exome sequencing are all-in-one solutions with ensured compatibility of reagents for AVITI sequencing.

Efficient use of AVITI's flow cell capacity for Twist Exome 2.0 plus Comprehensive Spike-in panel

Exome sequencing on the AVITI platform's dual independent flow cells offers flexibility in platform output to suit a range of sample throughput needs. Twist Bioscience's expert exome design strategy leverages efficient probe placement against target regions for a high on-target rate without wasting a substantial amount of reads. Twist Bioscience's double-stranded probes, which capture both the sense and antisense strands, offer excellent uniformity in target coverage. The pairing of efficient exome capture with the AVITI platform's flexible output allows for the processing of up to 64 exomes per run when utilizing both Cloudbreak Freestyle flow cells on the instrument.

For Research Use Only. Not for use in diagnostic procedures



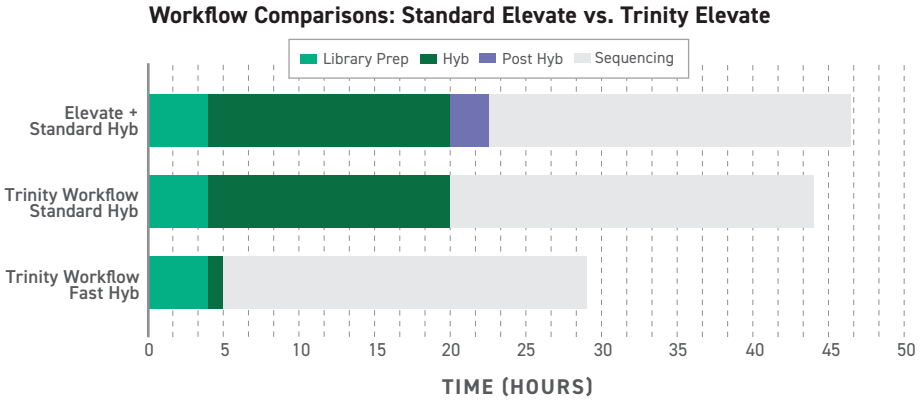
(ABOVE)
Figure 1. Sample Throughput Per Flow Cell. Twist Bioscience's efficient exome design offers coverage of relevant regions with 37.64 Mb of target region allowing between 24 and 32 exomes sequenced per flow cell. This output can be doubled if both flow cells are used during an AVITI sequencing run.

Rapid Exome Sequencing Using Twist Workflow Kits Designed for Trinity Flow Cells

The Twist for Element Trinity sequencing workflow dramatically simplifies target capture. This novel targeted sequencing workflow can be adapted to any scale. It saves the user up to 5 hours of hands-on time by eliminating steps and automating others.

Hybridize your DNA library with Twist panel probes overnight with Twist Standard Hyb, or for just one hour with Twist Fast Hyb, then load it directly onto your AVITI sequencer. This drastically reduces manual steps (**Figure 2**) and the removal of additional amplification results in higher library complexity and lower duplication rates.

Trinity radically changes the targeted sequencing workflow—but it doesn't compromise data quality. See below for sequencing metrics of Trinity Exome sequencing compared to traditional target enrichment.



(RIGHT)
Figure 2. Comparison of estimated workflow time for Element AVITI Elevate, Trinity Standard Hyb, and Trinity Fast Hyb workflows for library preparation and target enrichment. Each workflow produces exome-enriched libraries compatible with AVITI sequencing. The option for Trinity workflows reduces hands-on time to as little as one hour of hybridization for the Trinity Fast Hyb workflow option.

Exome Sequencing Performance With Element's AVITI Sequencing

Twist Library Preparation and Target Enrichment Kits include fragmentation, library amplification, and all the requisite enrichment reagents to capture an exome. The reagent workflow has been optimized to offer excellent uniformity of coverage. As a measure of exome sequencing performance on the AVITI platform, the relevant Picard metrics[3] are shown below demonstrating high on-target rate, library diversity, and coverage across both high and low %GC content.

The addition of Trinity Standard Hyb and Trinity Fast Hyb provides additional options for reduced hands-on time and manipulation of samples, allowing library preparation and target enrichment to be completed in a single day.

KIT	% ON TARGET	ESTIMATED LIBRARY SIZE	MEAN TARGET COVERAGE	% ZERO COVERAGE	% DUPLICATES	FOLD-80 BASE PENALTY	% 30X COVERAGE	AT DROPOUT	GC DROPOUT
Twist for Element Exome Kit	.882 ± .004	588M ± 52M	40.862 ± 1.105	.012 ± .000	.014 ± .001	1.475 ± .038	.760 ± .028	.078 ± .001	7.879 ± .838
Twist for Element Trinity Standard Hyb Kit	.869 ± .007	1055M ± 97M	42.635 ± .635	.012 ± .000	.008 ± .001	1.395 ± .028	.822 ± .015	.105 ± .031	5.229 ± 1.128
Twist for Element Trinity Fast Hyb Kit	.873 ± .010	737M± 83M	43.960 ± .996	.013 ± .000	.011 ± .001	1.342 ± .048	.862 ± .030	.852 ± .836	1.226 ± .773

Table 1. Exome Sequencing metrics. Values shown are averages ± standard deviation.

REFERENCES

1. Ashby, M. Whole Exome Sequencing 101: Cost-effective DNA sequencing to understand genetic disease. Element Biosciences https://www.elementbiosciences.com/blog/whole-exome-sequencing-101-cost-effective-dna-sequencing-to-understand-genetic-disease (2022).
2. Arslan, S., Garcia, F.J., Guo, M. et al. Sequencing by avidity enables high accuracy with low reagent consumption. Nat Biotechnol 42, 132–138 https://doi.org/10.1038/s41587-023-01750-7 (2024).
3. Picard Toolkit. Broad Institute https://broadinstitute.github.io/picard/ (2023).

PRODUCT SKU LIST

Element Compatible Workflow Kits

107686: Twist for Element, Exome 2.0 + Comp Spike workflow, including Enzymatic Fragmentation 1.0 + Standard Hyb + Twist Universal Adapter System, 16 Samples – Element Compatible, 12 reactions

109326*: 96 rxn Twist for Element Trinity, Exome 2.0 + Comp Spike, Standard Hyb Workflow Reagents for constructing libraries and performing standard hybridization. The resulting enriched libraries are compatible with Element Trinity workflows.

109328*: 96 rxn Twist for Element Trinity, Exome 2.0 + Comp Spike, Fast Hyb Workflow Reagents for constructing libraries and performing fast hybridization. The resulting enriched libraries are compatible with Element Trinity workflows.

Twist Universal Adapter System - Element Compatible Kits

107682: Twist Universal Adapter System, 96 Samples – Element Compatible • Twist Universal Adapters - Element Compatible • Twist UDI Primers - Element Compatible–20°C

*All AVITI Compatible reagents available for individual purchase.

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Quality and scale come without compromise when you partner with Twist Bioscience.

We work in the service of customers who are changing the world for the better. In fields such as medicine, agriculture, industrial chemicals, and data storage, by using our synthetic DNA tools, our customers are developing ways to better lives and improve the sustainability of the planet.

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