Element Biosciences

Product Sheet

Cloudbreak™ Sequencing Kits

Advancing ABC technology with efficiency and compatibility

Highlights

- Highest accuracy specification at low cost
- Flexible range of output and read lengths
- Simplified workflows eliminate library conversion

Introduction

Cloudbreak sequencing kits provide the reagents and flow cells for sequencing on the Element AVITI™ System. Multiple read lengths and output options scale with experiments to suit any application. Leveraging avidite base chemistry (ABC), Cloudbreak kits deliver high-quality data with low costs and rapid turnaround times.[1-3]

Cloudbreak Freestyle™ sequencing kits make operating the AVITI System even easier. Directly compatible with most linear third-party libraries, Cloudbreak Freestyle kits eliminate the library conversion step and save valuable preparation time.

Cloudbreak UltraQ™ sequencing kits set a new standard with the highest sequencing accuracy specification on the market today, delivering >70% reads at Q50.

Ultimate efficiency and accuracy

Using Cloudbreak and Cloudbreak Freestyle sequencing kits with individual addressable lanes enables separate sequencing of two different library pools per flow cell. Hardware and software upgrades on the AVITI24 deliver up to 50% higher sequencing output when compared to the AVITI with no change to the sequencing kit cost, maximizing potential sequencing output during a regular workday.

Cloudbreak Freestyle kits fully integrate on-board circularization into runs for either Elevate™ or third-party linear libraries. This innovation eliminates library conversion steps on the bench, saving time and minimizing touchpoints that can introduce errors. Additionally, the Cloudbreak Freestyle sequencing cartridge uses universal sequencing primers, eliminating the need to swap primers before thawing reagents.

Cloudbreak and Cloudbreak Freestyle sequencing kits offer exceptional flexibility with read lengths spanning from 2 x 75 to 2 x 300 bases, delivering outputs from 15 Gb to 300 Gb across high-, medium-, and low-output options. Combined, the sequencing kit include eight distinct configurations with run times ranging from 17 to 60 hours with each flow cell offering individually addressable lanes (Table 1).

Kit Configuration	Read Length	Output (Gb) (AVITI | AVITI24)	Read Count[a] (AVITI | AVITI24)	Run Time (hours)[b]	Q30
High output	2 x 300	180	300 million	60	> 85%
	2 x 150	300 | 450	1 billion | 1.5 billion	38	> 90%
	2 x 75	150 | 225	1 billion | 1.5 billion	24	> 90%
Medium output	2 x 300	60	100 million	51	> 85%
	2 x 150	150 | 225	500 million | 750 million	31	> 90%
	2 x 75	75 | 112.5	500 million | 750 million	20	> 90%
Low output	2 x 150	75 | 112.5	250 million | 375 million	27	> 90%
	2 x 75[c]	15 | 22.5	100 million | 150 million	17	> 90%

[a] Performance metrics, including read counts, are based on sequencing Element libraries. Actual results might differ based on factors, such as library type and preparation.

[b] Individually addressable lanes and other custom recipes can extend run times. Run times may increase by up to 5% on AVITI24.

[c] 2 x 75 low output kits are only available in the Cloudbreak Freestyle kit configuration.

Table 1. AVITI performance metrics for Cloudbreak and Cloudbreak Freestyle kit configurations

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Kit Configuration	Read Length	Output (Gb)	Read Count[a]	Run Time (hours)	Q50
Cloudbreak UltraQ	2 x 150	240	800 million	44	> 70 %

[a] Performance metrics, including read counts, are based on sequencing Elevate libraries. Actual results might differ based on factors, such as reference quality, sample type, library type, and preparation details.

Table 2. AVITI performance metrics for Cloudbreak UltraQ kit configuration

Both Cloudbreak and Cloudbreak Freestyle kits are designed for minimal waste and easy disposal. Reagent overage supports the extra cycles that index sequences and unique molecular identifiers (UMIs) need to identify samples with high confidence.

Cloudbreak UltraQ kits deliver >70 % of reads at or above Q50 and >90 % of reads at or above Q40 (Table 2). It uses multiple strategies to reduce the most common error types arising from both library prep and sequencing for the development of highly sensitive assays.

Summary

The AVITI System with Cloudbreak sequencing provides flexibility in configuring an end-to-end NGS workflow, integrating library prep, sequencing, and analysis for the application of your choice. Combining an open ecosystem of library prep and analysis options, AVITI sequencing provides the flexibility to meet the needs of any lab.

Ordering information

Cloudbreak	Catalog #
AVITI 2x75 Sequencing Kit Cloudbreak Medium	860-00007
AVITI 2x75 Sequencing Kit Cloudbreak High	860-00004
AVITI 2x150 Sequencing Kit Cloudbreak Low	860-00005
AVITI 2x150 Sequencing Kit Cloudbreak Medium	860-00006
AVITI 2x150 Sequencing Kit Cloudbreak High	860-00003
AVITI 2x300 Sequencing Kit Cloudbreak Medium	860-00009
AVITI 2x300 Sequencing Kit Cloudbreak High	860-00008

Cloudbreak Freestyle	Catalog #
AVITI 2x75 Sequencing Kit Cloudbreak FS Low	860-00034
AVITI 2x75 Sequencing Kit Cloudbreak FS Medium	860-00014
AVITI 2x75 Sequencing Kit Cloudbreak FS High	860-00015
AVITI 2x150 Sequencing Kit Cloudbreak FS Low	860-00011
AVITI 2x150 Sequencing Kit Cloudbreak FS Medium	860-00012
AVITI 2x150 Sequencing Kit Cloudbreak FS High	860-00013
AVITI 2x300 Sequencing Kit Cloudbreak FS Medium	860-00016
AVITI 2x300 Sequencing Kit Cloudbreak FS High	860-00017
Custom Primer Set Cloudbreak Freestyle	820-00025

Cloudbreak UltraQ	Catalog #
AVITI 2x150 Sequencing Kit Cloudbreak UltraQ	860-00018

Accessory Kits	Catalog #
PhiX Control Library, Adept	830-00004
Cloudbreak PhiX Control, Elevate	830-00017
Cloudbreak FS PhiX Control, 3rd Party	830-00023

To learn more, visit:
elementbiosciences.com/products/cloudbreak

References

1. Semyon Kruglyak, "Measuring the Accuracy of Element AVITI Sequencing Data," Element Biosciences (blog), July 13, 2022, https://www.elementbiosciences.com/blog/measuring-accuracy-element-aviti-sequencing-data.
2. Carroll, Andrew, Alexy Kolesnikov, Daniel E. Cook, et al., "Accurate human genome analysis with Element Avidity sequencing," *bioRxiv* (August 2023): https://doi.org/10.1101/2023.08.11.553043.
3. Arslan, Sinan, Francisco J. Garcia, Minghao Guo, et al., "Sequencing by avidity enables high accuracy with low reagent consumption," *Nature Biotechnology* (May 2023): https://doi.org/10.1038/s41587-023-01750-7.

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