Element Biosciences

AVITI24™ with Teton™ CytoProfiling

The next generation of single cell biology—one integrated platform for sequencing and multiomic analysis

 | LT-00046 Rev. A | November 2024

Next generation sequencing meets single cell multiomics

The Element AVITI24 system is the first benchtop platform enabling high-quality, low-cost sequencing and single cell multiomics in one powerful system.

Cloudbreak Sequencing

Q50
>70% reads (UltraQ™ 2x150)

2+ B
reads/dual-sided run

$1
per M reads at 2x75

Teton CytoProfiling

Multiomics
RNA, protein, cell paint

24h
total workflow time

2M cells
with 20cm² imageable area/run

Flexibility

- Dual NGS and multiomic capabilities
- Dual flow cells
- Onboard target capture

Quality and Reliability

- >70% reads Q50 (using UltraQ)
- Global service and support team
- >160 days mean time between failure

Affordability

- Industry-leading price/Gb on a benchtop platform
- Guaranteed reagent pricing

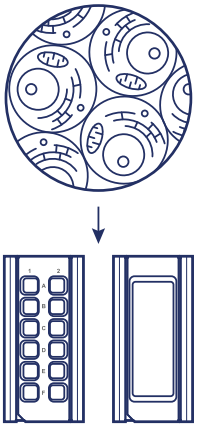
 | LT-00046 Rev. A | November 2024

Understand the complex biology of a single cell with Teton CytoProfiling

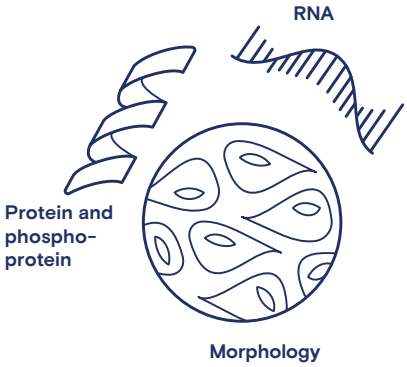
AVITI24 transcends traditional next generation sequencing methods by enabling comprehensive multiomic analysis with Teton CytoProfiling in biological samples. In a single 24-hour run, localize the expression of RNA, proteins, phospho-proteins, and cell morphology in up to 2 million cells at subcellular resolution. Teton CytoProfiling allows you to tackle complex biological questions with a fully integrated view of cell biology.

With a single 24 hour AVITI24 Teton run

Profile up to 2M cells



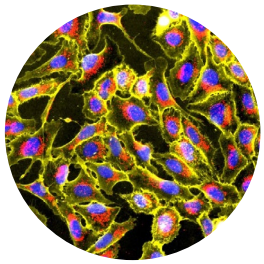
Detect RNA, protein, and morphology in every cell



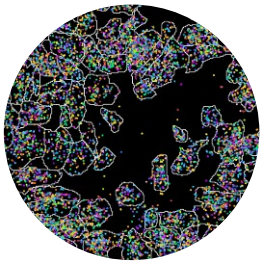
Accelerate discoveries across diverse applications

- Time course studies
- Drug titrations
- Combinatorial drug screens
- Cell synchronization
- Cell phenotyping
- Cellular lineage tracking

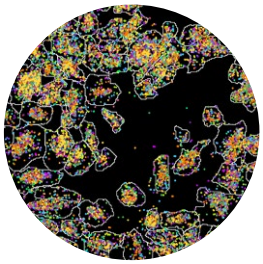
Cell paint



RNA



Protein



True multiomic readouts

Reduce cost, time, and workflow complexity by simultaneously detecting RNA, protein, and cell paint from the same sample at single cell resolution.

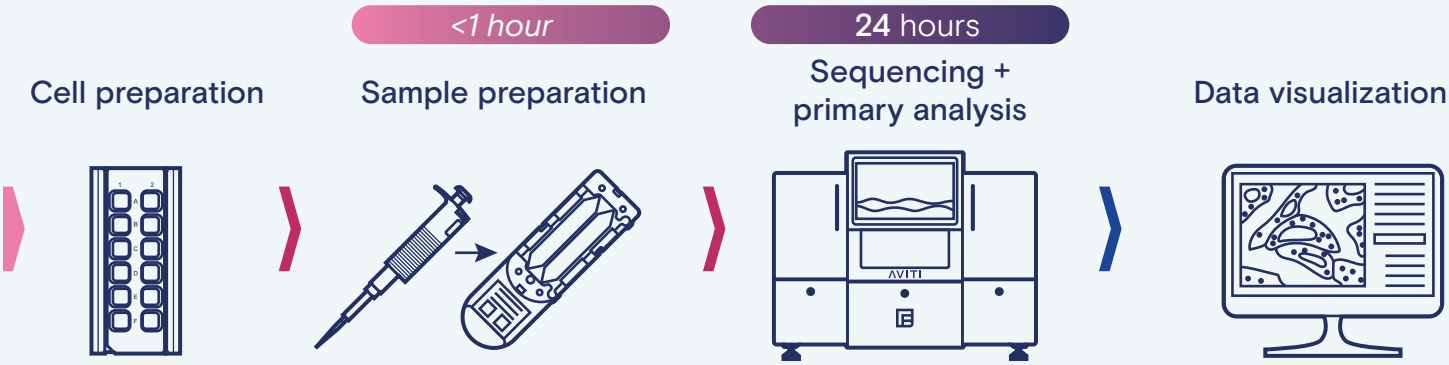
Sensitive and specific

Detect thousands of transcript and protein counts per cell for sensitive detection of low and high-expression genes. Confidently assign target to cells with multi-feature cell segmentation.

Simplified workflow

Profile up to 2 million cells with 20cm^2 of imageable area per dual-sided run. Accelerate discoveries with <1 h of off-instrument prep time, 24 h instrument run time, and onboard primary analysis.

Simultaneous multiomics with minimal hands-on time and ultra-fast run times



Comprehensive insights into critical biological pathways

Teton CytoProfiling launches with comprehensive panels to understand MAPK cell cycle and apoptosis pathways. Additional immuno-oncology, neuroscience, and customized panels are coming soon in early 2025.

Deep cell morphology profiling

6-plex cell paint

Cell membrane
Actin
Endoplasmic reticulum
Nucleus
Mitochondia
Golgi apparatus

Comprehensive MAPK pathway coverage

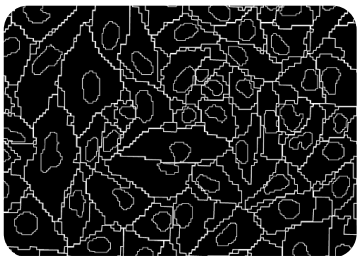
350-plex RNA
50-plex protein / phospho-protein

MAPKKK, MAPKK, MAPK
Cell cycle regulators
Transcription factors
DNA replication
ERK, JNK, p38 cascades
Pre-apoptotic factors
Anti-apoptotic factors
Stress response

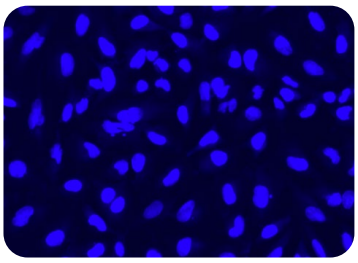
Transforming data to biological insights

Onboard primary analysis

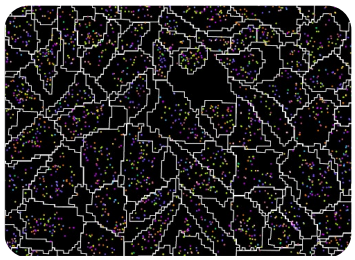
Real-time processing for ready-to-analyze data.



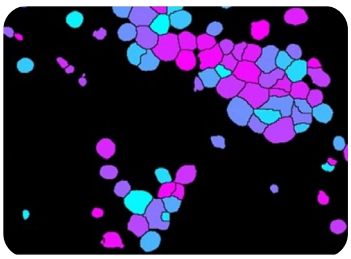
Cell segmentation



Intensity quantification (cell paint)



Cell assignment (transcripts/proteins)

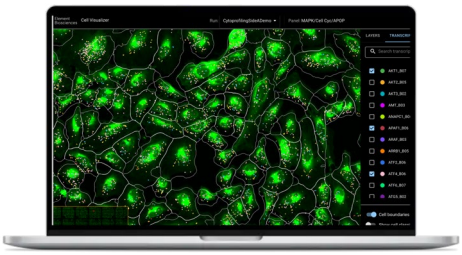


Morphology feature extraction

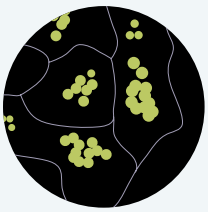
Offboard primary analysis

Interactive data visualization and analysis

Element CytoCanvas™: explore your data with easy-to-use, free visualization software

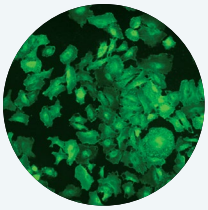


Open data format for easy integration into community tools and downstream analysis



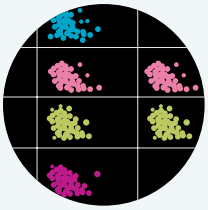
Cell segmentation

Identify single cells using multiple features.



Cell morphology

Visualize size, shape, & texture of cells.

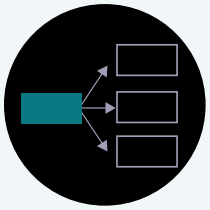


Clustering

Identify cell types & states with morphology or molecular markers.

Differential expression

Perform cell-type-specific gene and protein expression analysis.



Pathway analysis

Resolve regulatory pathways within cell subsets.

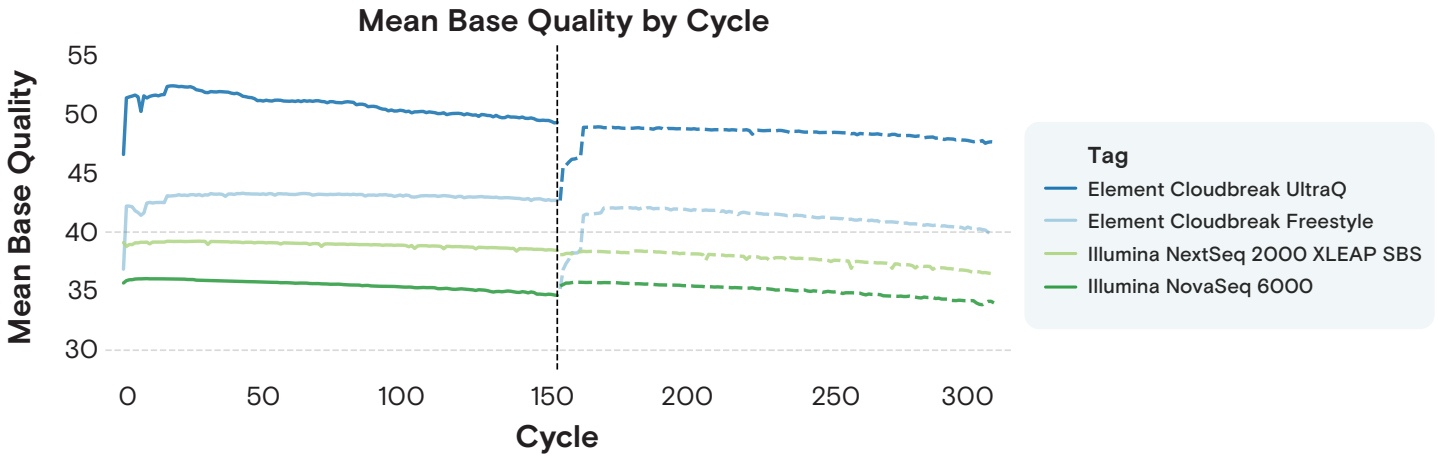
Network analysis

Resolve cell-cell signaling in adherent cells.

Unparalleled sequencing performance and flexibility

Industry leading quality

AVITI24 sequencing is powered by our avidite base chemistry, leveraging the highest quality data specifications on market today. With industry leading accuracy standards of >90% Q40 and >70% Q50 when using our Cloudbreak UltraQ sequencing kits, we provide the firmest possible foundation for the development of highly sensitive assays.



Simplified workflows

Leveraging our innovative ABC chemistry, our sequencing kits enable streamlined workflows, so you can spend less time setting up experiments and more time understanding biology.

- **Cloudbreak Freestyle™ kits** enable direct loading of linear libraries with no off-instrument conversion steps. Compatibilty with a diverse range of third-party library types allows you to maintain existing library prep workflows.
- **Trinity™ sequencing kits** revolutionize targeted sequencing workflows by eliminating or integrating time-consuming steps on-board the AVITI instrument—saving up to 5 hours of hands-on time.

Flexible throughput

Scale your run output to suit virtually any application, without waiting or paying more.

Dual flow cells with individually addressable lanes mean that you can fully saturate two high-output flow cells to maximize capacity or simply load one lane of a low-output flow cell. With flexible read lengths ranging from 2x75 to 2x300bp and a variety of output configurations, AVITI24 sequencing scales to your research needs at an affordable price.

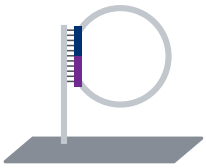
Library preparation

Avidite base chemistry (ABC) seamlessly integrates into your current workflow by supporting any library as a template for sequencing. Sequencing on the AVITI family is compatible with both native Elevate™ library solutions and third-party library prep methods by sequencing with Cloudbreak Freestyle, maximizing ease-of-use and compatibility.

Adapted Prep	Cloudbreak Freestyle	Prepare Third-Party Library	Sequence with ABC	Analyze Data	
	Adept Workflow	Prepare Third-Party Library	Adapt Library	Sequence with ABC	Analyze Data
Native Prep	Elevate Workflow	Prepare Elevate Library	Sequence with ABC	Analyze Data	

ABC sequencing

ABC sequencing leverages the power of avidites and PCR-free library amplification to define an entirely unique approach to sequencing.

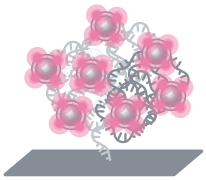


Circularization

A DNA library molecule attaches to low-binding surface chemistry coating the flow cell. A capture primer immobilized to the coating joins the library ends to circularize the DNA library molecule and prepare for PCR-free amplification. Rolling circle amplification can also amplify manually circularized libraries.

Amplification

Rolling circle amplification (RCA) copies the circularized DNA library molecule, creating a continuous strand bound into a polony. Only the circularlized DNA library molecule is copied, removing PCR artifacts propogated using other amplification methods.



Sequencing

Avidites bind to the polony at multiple sequencing sites, creating a stable complex for imaging. Ultratight binding ensures signal persistence for precision base calling with a 100-fold reduction in reagent concentration.

Software and analysis

Element software is simple, secure, and transparent. You can create your own end-to-end solution through an open ecosystem with flexibility.

ElemBio™ Cloud centralizes data management and can scale from plug-and-play simplicity to fully customized solutions.

Element Biosciences

Headquarters

10055 Barnes Canyon Road
Suite 100
San Diego, CA 92121
Telephone: 619.353.0300
Web: elementbiosciences.com
Email: info@elembio.com

Technical Support

Telephone: 866.353.6246
Email: support@elembio.com

We are global

Service providers
elementbiosciences.com/resources/service-providers

Channel partners and distributors
elementbiosciences.com/resources/distributors

Start your AVITI 24 journey today.

Quote
elementbiosciences.com/quote

Technology
elementbiosciences.com/technology/avidite-base-chemistry

Applications
elementbiosciences.com/applications

Publications and Documentation
elementbiosciences.com/resources

[1] Comparative data derived from analyses of HG001 benchmarks. Actual results might differ based on lab-specific factors.