Not enough time or sample for Chromatin IP?
Try CUT&RUN!

What is CUT&RUN?

CUT&RUN stands for **Cleavage Under Targets & Release Using Nuclease.**
It is an *in vivo* method that uses a target-specific primary antibody and a Protein A-Protein G-Micrococcal Nuclease (pAG-MNase) to isolate specific protein-DNA complexes[1,2,3].

REFERENCES
1. Skene P.J., et al. (2018) Nat. Protac. 13(5), 1006-1019.
2. Meers M.P., et al. (2019) BioRxiv 1, 569129.
3. Skene P.J., Henikoff S. (2017) Elife 6, e21865.

CUT&RUN Products

Cell Signaling Technology offers two flexible solutions. Try our new kit with your favorite target antibody. The kit contains the pAG-MNase, all the necessary buffers and reagents, and a detailed protocol. Or just order the pAG-MNase and Spike-In DNA if you prefer.

#86652 CUT&RUN Assay Kit

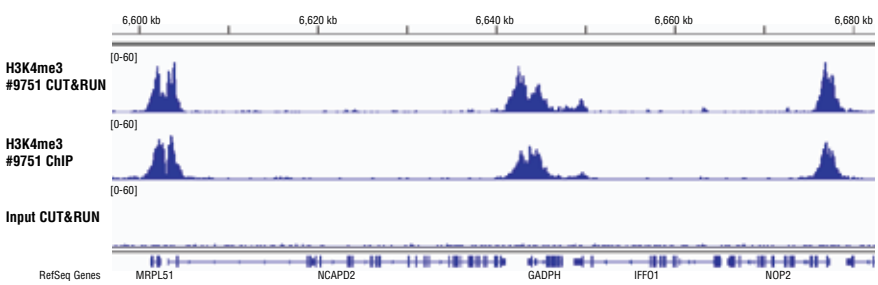
#40366 CUT&RUN pAG-MNase and Spike-In DNA

#14209 DNA Purification Buffers and Spin Columns (ChIP, CUT&RUN)

The Benefits of CUT&RUN

Low sample requirement	100K cells recommended
Fast time to results	1-2 days from cell to DNA
Sequencing cost savings	Only 3-5 million high-quality reads required
Target versatility	Generate sequencing and/or qPCR data for histones, histone modifications, transcription factors, and cofactors
Antibody versatility	Compatible with rabbit and mouse antibodies
Reproducible results	Spike-In control DNA to normalize signal between samples
Avoid "cross linking" artifacts	An *in vivo* method performed using native chromatin

The CUT&RUN Assay Kit from CST is ideally recommended for use with 100,000 cells and works as well as ChIP-seq



CUT&RUN and ChIP assays were performed with HCT 116 cells ($1x10^5$ for CUT&RUN, $4x10^6$ cells for ChIP) and Tri-Methyl-Histone H3 (Lys4) (C42D8) Rabbit mAb #9751, using the CUT&RUN Assay Kit #86652 or the SimpleChIP® Plus Enzymatic Chromatin IP Kit (Magnetic Beads) #9005. DNA Libraries were prepared using DNA Library Prep Kit for Illumina (ChIP-seq, CUT&RUN) #56795. Comparison of enrichment at the GAPDH gene, a known target of H3K4me3. The input track is from the CUT&RUN input sample.

For additional information, please visit:
www.cst-science.com/CUT-RUN

Cell Signaling TECHNOLOGY®

How CUT&RUN Works

Method Overview

Ab & pAG-MNase binding:

1. Cells are immobilized on Concanavalin A Magnetic Beads to allow for subsequent buffer and reagent exchanges.

2. Cell membranes are then permeabilized with digitonin to facilitate the entry of primary antibody and pAG-MNase fusion enzyme into the cell nuclei.

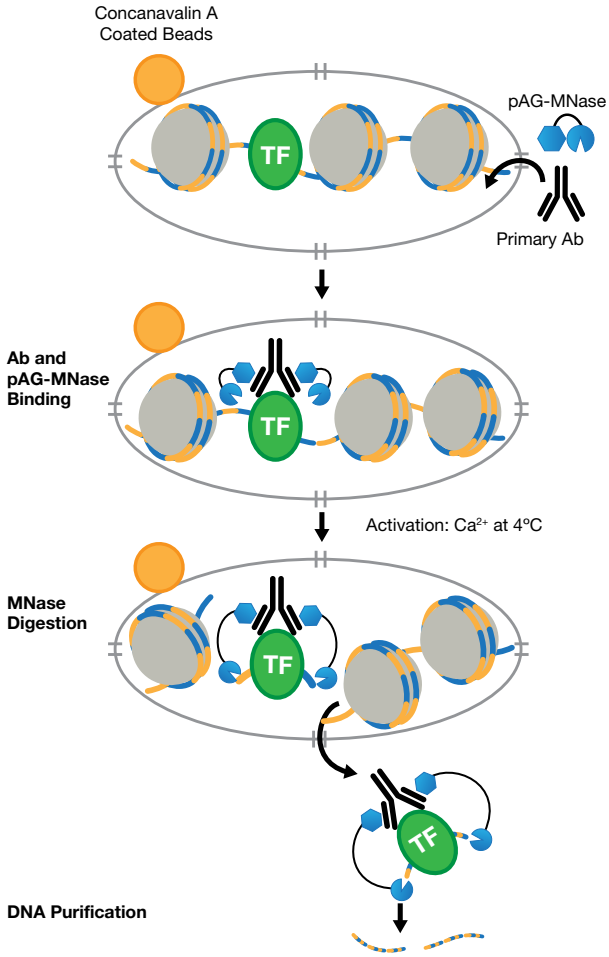
3. The target-specific primary antibody recruits the pAG-MNase to the chromatin through protein-protein interactions between the antibody and the pAG domain of the fusion enzyme.

MNase Digestion:

4. The addition of Ca^{2+} activates the pAG-MNase, which gently cleaves and liberates the desired chromatin fragments, allowing them to diffuse away from the genomic chromatin, out of the cell, and into the supernatant.

DNA Purification:

5. DNA is purified using DNA purification spin columns or phenol/chloroform extraction followed by ethanol precipitation. The purified, enriched DNA is then identified and quantified using qPCR or NG-seq.



Contact Information

Technical Support: **www.cellsignal.com/support**

Ordering Information: **www.cellsignal.com/orderinfo**

For a complete list of CST offices and distributors, please visit: **www.cellsignal.com/contactus**

For additional information, please visit:
www.cst-science.com/CUT-RUN

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