EpiCypher®
Bringing Epigenetics to Life

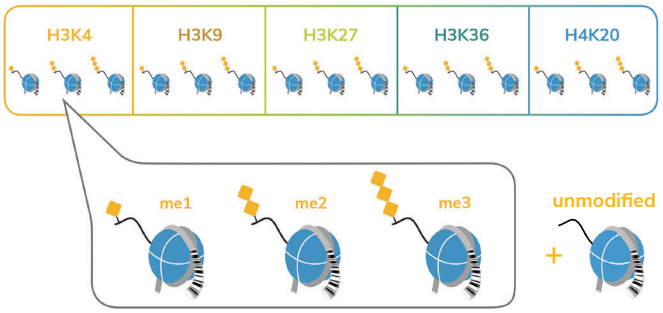
SNAP-ChIP®
Spike-in controls for ChIP

SNAP ChIP® spike-in panels

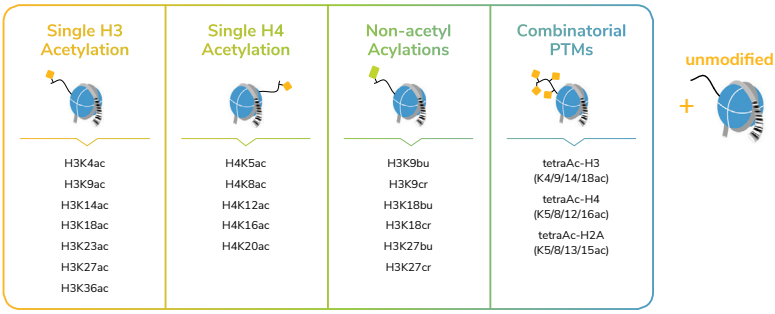
SNAP-ChIP® spike-in panels are composed of a single pool of uniquely modified DNA-barcoded dNucs carrying disease-relevant modifications

Pick your favorite panel

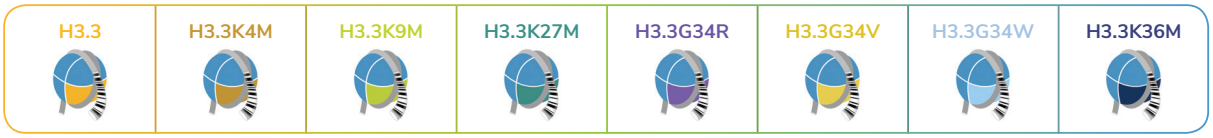
K-MetStat Panel *(Cat. No. 19-1001)*



K-AcylStat Panel *(Cat. No. 19-3001)*



OncoStat Panel *(Cat. No. 19-2001)*

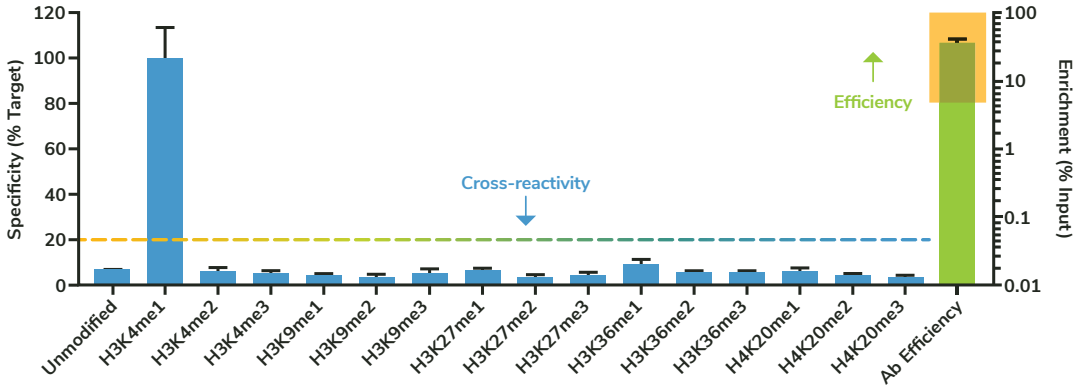


SNAP-ChIP® certified antibodies

EpiCypher has embarked on a massive effort to identify the highest quality ChIP-certified antibodies using our proprietary SNAP-ChIP® technology.

SNAP-ChIP® certified antibodies set a new higher standard for antibody performance.

SNAP-ChIP certified antibodies exhibit less than 20% cross-reactivity to related PTMs and more than 5% efficiency of target PTM recovered after immunoprecipitation.



For more information, visit www.epicypher.com/snap-chip-certified-antibodies/

@epicypher

Sample **N**ormalization & **A**ntibody **P**rofiling for **ChIP**

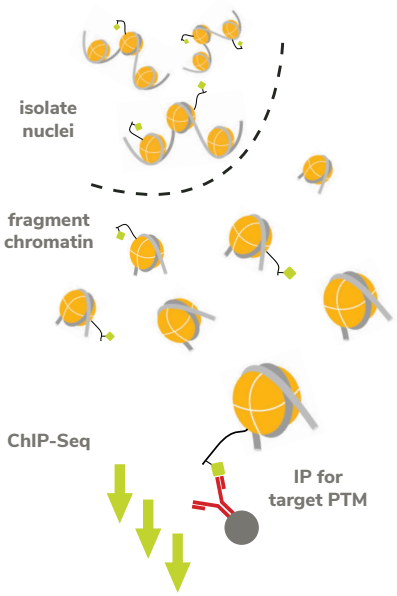
SNAP-ChIP® is a next-generation spike-in control for chromatin immunoprecipitation (ChIP) comprised of DNA-barcoded recombinant designer nucleosomes (dNucs)

SNAP-ChIP can easily be added to any ChIP workflow to standardize and normalize samples (across experiments) and rigorously validate antibody specificity. For the first time, users can monitor antibody specificity and evaluate experimental variability within a ChIP experiment, setting SNAP-ChIP apart from other spike-in controls currently available on the market.

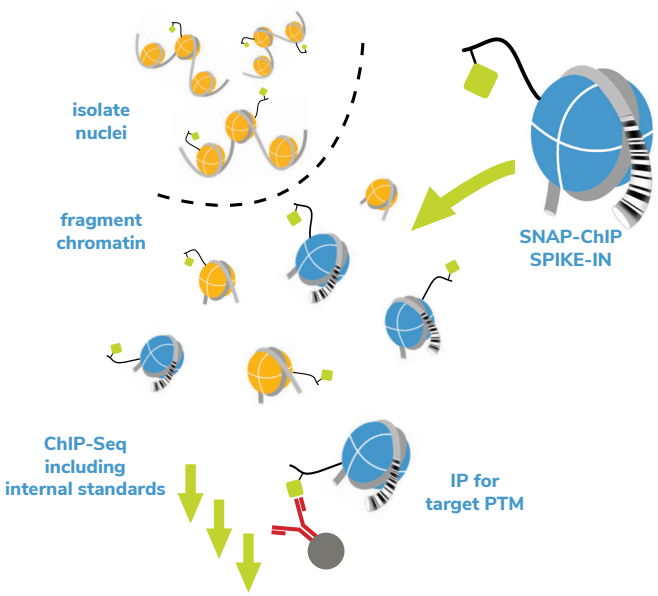
FIGURE 1

Overview of the SNAP-ChIP® approach: A pool of recombinant dNucs with defined post-translational modifications (PTMs) identified by unique DNA barcodes is added to sample chromatin prior to immunoprecipitation (IP). Capture of the barcoded nucleosomes (on / off target) allows the user to assess antibody specificity, monitor experimental variability, and normalize experiments. Quantitative recovery of barcoded dNucs (via qPCR) provides a useful STOP / GO capability prior to advancing to next-generation sequencing.

Standard ChIP Protocol



SNAP-ChIP®



Limitations

- No way to assess antibody specificity or efficiency
- Minimally reproducible
- Current methods to normalize experiments (e.g. exogenous chromatin spike-ins) are heterogeneous, poorly defined, and subject to lot-to-lot variability

SNAP-ChIP® Advantages

- Determine antibody specificity and target pulldown efficiency
- Monitor experimental variability within experiments
- Quantitative recovery of DNA barcodes (via qPCR) provides useful **STOP / GO** capability before advancing to **NGS**
- Homogenous, fully defined dNucs are subjected to rigorous quality control for lot-to-lot consistency

SNAP-ChIP spike-ins are adapted from ICeChIP technology (Shah et al. Mol Cell, Vol. 72, Issue 1, 162-177, 2018 and Grzybowski et al. Mol Cell, Vol.58 , Issue 5 , 886 - 899, 2015)

Sample Normalization & Antibody Profiling for **ChIP**

Why should I worry about antibody specificity?

We recently tested the performance of 54 “ChIP-grade” commercial antibodies to H3K4 methyl states using both peptide array and SNAP-ChIP® (*Shah et al., 2018 Mol Cell;72:162-177*). This study establishes SNAP-ChIP as the new gold standard for ChIP antibody validation.

Here is what we found...

- **Peptide arrays fail to predict antibody specificity in ChIP**
- **Most commonly used H3K4me3 antibodies (including ENCODE recommended antibodies) are highly cross-reactive to H3K4me2 in SNAP-ChIP** (see heatmap)
- **Don’t let faulty antibodies compromise your research!** Use SNAP-ChIP to validate antibody specificity and monitor antibody performance when it matters → IN YOUR EXPERIMENT

DO YOU REALLY KNOW WHAT YOU ARE PULLING DOWN IN YOUR CHIP?

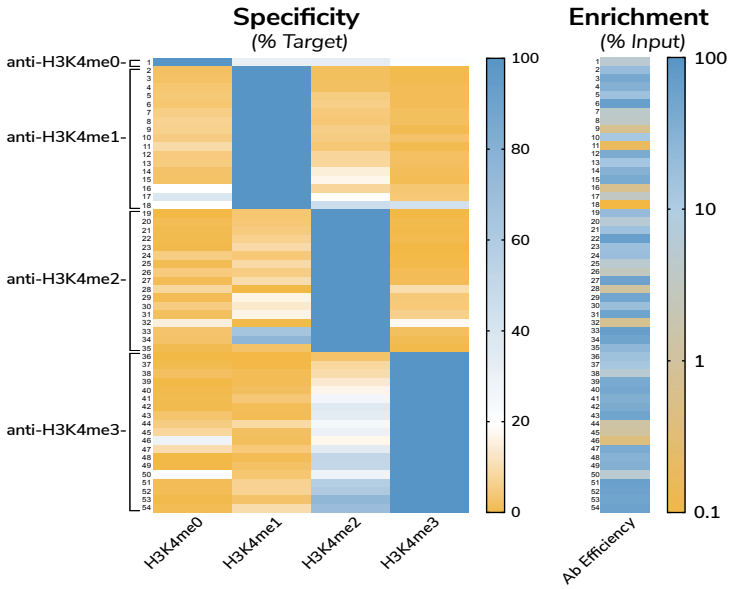
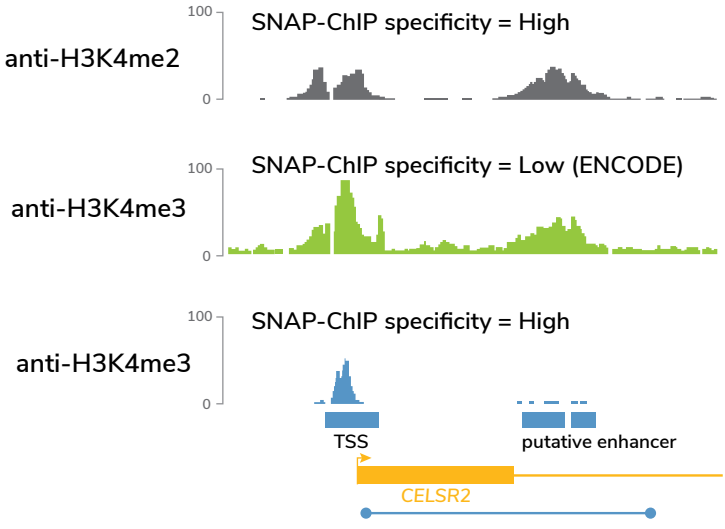


FIGURE 2

Summary of Shah et al. study, published in Mol Cell, 2018.

With SNAP-ChIP® spike-in controls, ChIP is no longer a black box



- **Antibody specificity matters.** Figure compares ChIP tracks using H3K4me3 antibodies with low or high specificity. A highly specific H3K4me2 antibody is shown for reference.
- **When using a low specificity antibody,** genomic areas reported as containing H3K4me3 are actually a result of a contaminating H3K4me2 signal.
- **Use SNAP-ChIP to control your ChIP experiments**

Spike-in control to track ChIP experimental variability

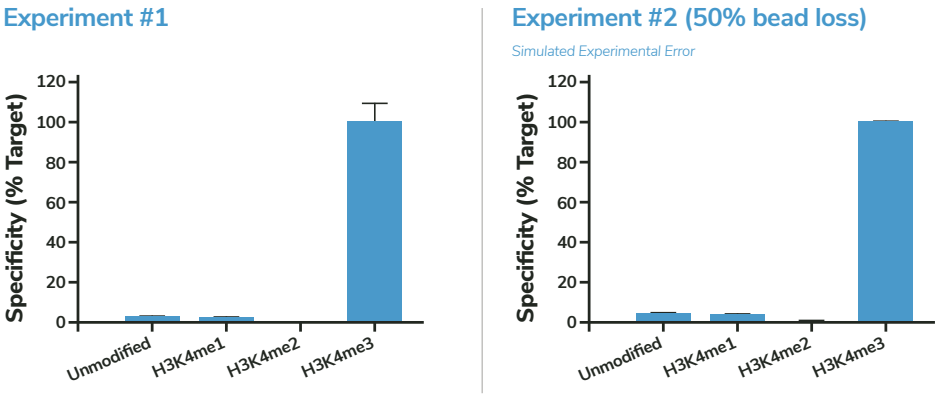
SNAP-ChIP® spike-in controls for reliable sample normalization

The use of exogenous chromatin (*e.g. Drosophila*) as spike-in controls has been adopted for ChIP sample normalization. However, these reagents are poorly defined (*i.e.* contain unknown PTM levels) and highly variable from batch-to-batch, limiting their use for consistent sample normalization.

SNAP-ChIP® spike-ins are fully defined, making them the ideal tool for generating reliable ChIP data. By including in your ChIP experiments, SNAP-ChIP can be used to monitor experimental variation and normalize samples for reliable cross-sample comparisons. **Get results you can trust with SNAP-ChIP.**

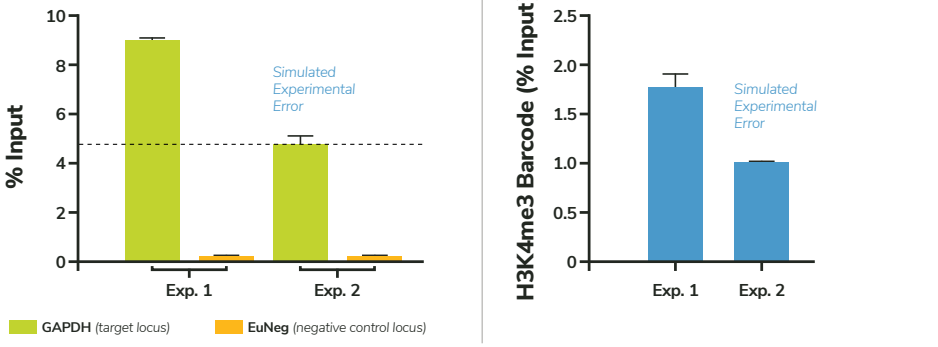
1

Check antibody specificity using SNAP-ChIP® Spike-ins:



2

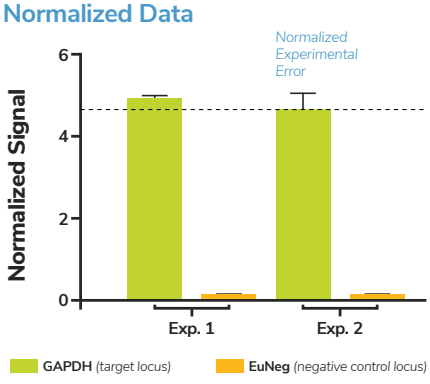
Calculate % input of gene loci and SNAP-ChIP® Spike-ins:



3

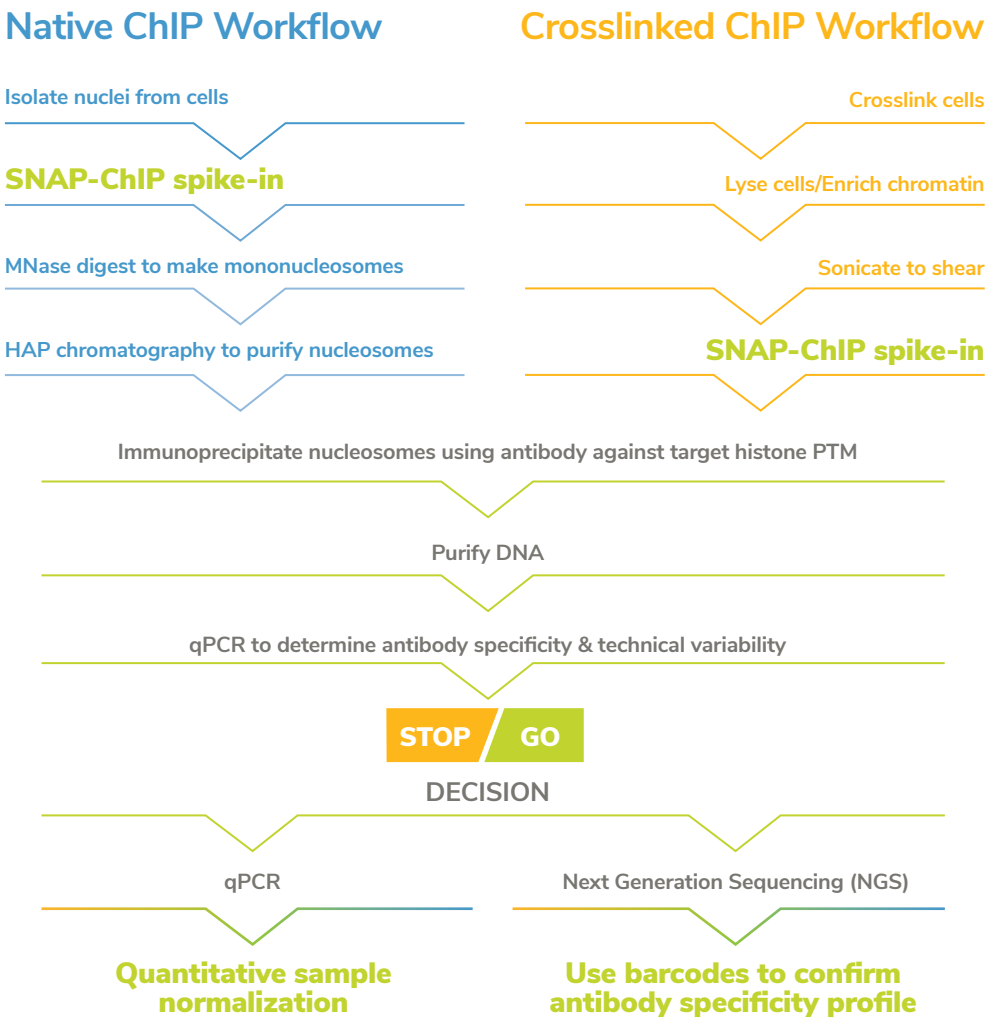
Normalize gene loci using a simple equation:

$$\text{NORMALIZED SIGNAL} = \frac{\text{\% Input of Gene Locus}}{\text{\% Input of SNAP-ChIP®}}$$



Sample **N**ormalization & **A**ntibody **P**rofiling for **ChIP**

SNAP-ChIP® seamlessly integrates into existing ChIP workflows. Just add SNAP-ChIP® to your protocol and use it. It's that simple!



ORDERING INFO

SNAP-ChIP K-MetStat
Catalog No. 19-1001
Price: $349 / *10 ChIP equivalents*

SNAP-ChIP OncoStat
Catalog No. 19-2001
Price: $349 / *10 ChIP equivalents*

SNAP-ChIP K-AcylStat
Catalog No. 19-3001
Price: $349 / *10 ChIP equivalents*

Website: EpiCypher.com/SNAP-ChIP

EpiCypher®
Bringing Epigenetics to Life

Related Products

SNAP-ChIP certified Antibodies:

H3K4me2 (*polyclonal*)	13-0013	100 µg	$399.00
H3K4me2 (*monoclonal*)	13-0027	100 µg	$399.00
H3K4me3 (*monoclonal*)	13-0028	100 µg	$399.00
H3K9me1 (*monoclonal*)	13-0029 (Coming Soon)	100 µg	$399.00
H3K27me1 (*monoclonal*)	13-0015	100 µg	$399.00
H3K27me3 (*monoclonal*)	13-0030 (Coming Soon)	100 µg	$399.00
H3K36me3 (*monoclonal*)	13-0031 (Coming Soon)	100 µg	$399.00

Website:
EpiCypher.com/snap-chip-certified-antibodies/

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Recombinant Nucleosomes (rNucs)
Designer Nucleosomes (dNucs)
Variant Nucleosomes (vNucs)
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Purified Nucleosomes (HeLa, Chicken)

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