EPICYPHER™

Pioneering the Science of Epigenetics™

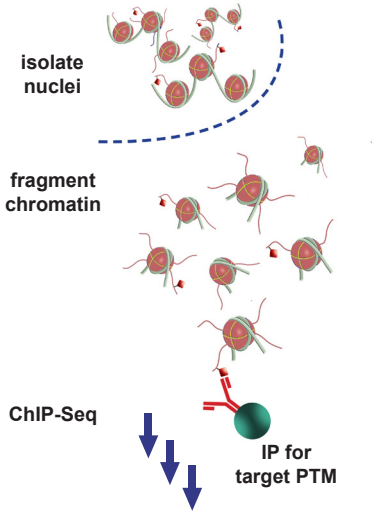
# SNAP-ChIP™ for histone lysine methylation

**S**ample **N**ormalization & **A**ntibody **P**rofiling for **ChIP** using EpiCypher's **K-MetStat™ panel**

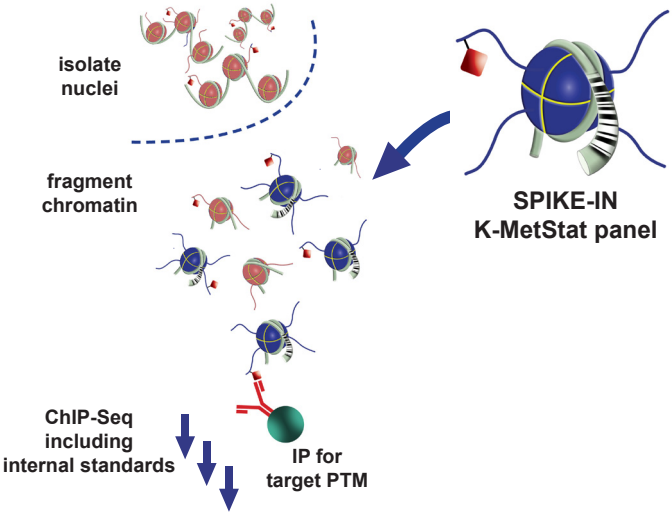
**SNAP-ChIP** uses DNA barcoded recombinant designer nucleosomes (dNucs) as next-generation spike-ins for chromatin immunoprecipitation (ChIP). The first product in this family consists of a panel of dNucs carrying well-studied histone lysine methyl marks (**K-MetStat panel**). EpiCypher's K-MetStat panel 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 technical variability within a ChIP experiment, setting SNAP-ChIP apart from any other spike-in controls currently available on the market.

**K-MetStat panel** (**lysine-methylation status panel**) is comprised of 16 uniquely modified dNucs carrying disease-relevant lysine methylation modifications on histones H3 and H4. Each modification site in the panel (H3K4, H3K9, H3K27, H3K36, H4K20) is represented by all lysine methylation states (*i.e.* me0, me1, me2, and me3). This allows for maximum user flexibility and provides the ability to gather detailed antibody cross-reactivity data. Additional modification-specific dNuc panels are currently in development (*e.g.* arginine methylation, lysine acetylation, etc.) and slated for release in 2018.

## Standard ChIP Protocol




## SNAP-ChIP™




### CURRENT 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 pull-down efficiency
- Monitor technical variability within experiments
- Quantitative recovery of DNA barcodes (via qPCR) provides useful STOP / GO capability before advancing to NGS
- Homogenous, defined dNucs are subjected to rigorous quality control for lot-to-lot consistency

**Figure 1:** Overview of the SNAP-ChIP approach (adapted from ICe-ChIP technology: Grzybowski *et al. Mol Cell*, *Vol. 58 , Issue 5 , 886 - 899, 2015*). 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 technical variability, and normalize experiments. Quantitative recovery of barcoded dNucs (via qPCR) provides a useful STOP / GO capability prior to advancing to next-generation sequencing.

*K-MetStat Panel details* ►

## K-MetStat panel:

*16 uniquely modified designer nucleosomes*

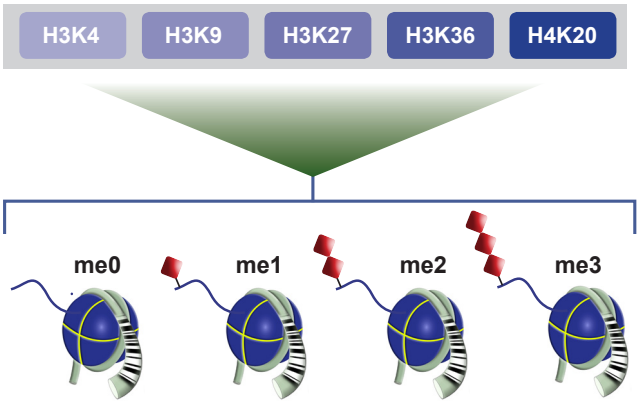



**Figure 2:** Schematic depicting the 16 dNucs included in the K-MetStat Panel, each uniquely DNA barcoded.

## Why do I need to assess antibody specificity in ChIP?

- Antibody cross-reactivity can lead to gross misinterpretation of biological findings
- Methylation states (me0/1/2/3) are challenging targets for antibodies due to high degree of structural similarities
- SNAP-ChIP addresses these limitations by enabling quantification of antibody specificity within every ChIP experiment:

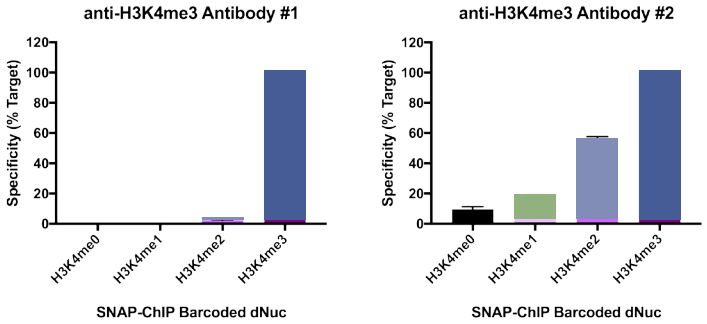
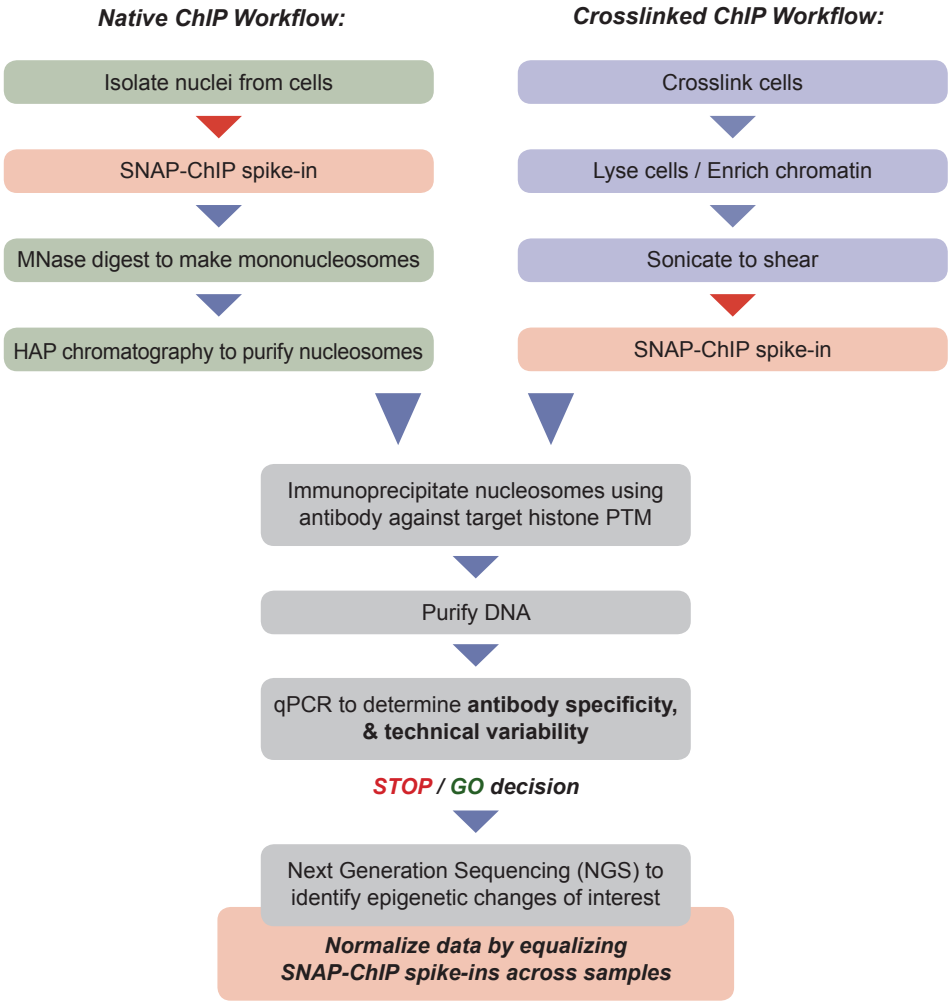



**Figure 3:** A SNAP-ChIP experiment (n = 3) using two H3K4me3 antibodies shows that Antibody #1 exhibits <3% cross-reactivity with alternate H3K4 methyl states; Antibody #2 shows ~60% cross-reactivity with H3K4me2, substantially compromising ChIP-studies.

## SNAP-ChIP seamlessy integrates into existing ChIP workflows




## ORDERING INFO:

### SNAP-ChIP K-MetStat

Catalog No. 19-1001
Price: $249 / 10 ChIP equivalents
Website: EpiCypher.com/SNAP-ChIP

### Related Products *(Coming Soon)*:

Lysine acetylation status panel (K-AcStat)
Aginine methylation status panel (R-MetStat)

### Related Nucleosome products:

EpiDyne™ Nucleosome Remodeling Substrates
Recombinant Nucleosomes (rNucs)
Designer Nucleosomes (dNucs)
Variant Nucleosomes (vNucs)
Oncogenic Nucleosomes (OncoNucs)
Purified Nucleosomes (HeLa, Chicken)

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