# AFA™ Focused-ultrasonicators

AFA™ Focused-ultrasonicators deliver ultrasonic acoustic energy in a highly tunable manner, enabling programmable control of peak incident power, duration, and duty factor of the acoustic bursts delivered to a sample; tuning these acoustic characteristics controls chromatin shearing. The Covaris AFA Focused-ultrasonicators are extremely robust platforms providing reproducible chromatin shearing results with every sample. Shearing performance is guaranteed and verifiable with the DNA Shearing Verification Kit

## S220™

- Highly versatile system for a variety of sample prep applications
- High Cell, Low Cell and Tissue truChIP with the same instrument

## M220™

New Benchtop System

- Ideal for Low Cell truChIP applications
- Compact design with integrated Peltier chiller fits on any lab bench
- Fast start-up and easy to use

## E220™ & LE220™

- Ideal for high throughput truChIP applications
- Easily integrates with automated liquid handling platforms
- Reproducible chromatin shearing across entire 96 well format



# truChIP™ Chromatin Shearing Kits

- Improve the sensitivity of your current ChIP protocol
- Experience unprecedented reproducibility
- Compatible with most homebrew and commercial ChIP protocols

The kits are optimized for chromatin shearing with AFA Focused-ultrasonicators to deliver sensitive and reproducible ChIP results. With AFA, efficient chromatin shearing in low SDS (0.1%) and non-ionic buffers is achieved. The isothermal AFA process preserves protein epitopes and protein-DNA complexes, resulting in more chromatin available for immunoprecipitation, which leads to improved sensitivity for your ChIP experiments. Chromatin fragmented with truChIP is easily compatible with any commercial or home-brew ChIP protocols.

| Part # | Product Name | Description |
|---|---|---|
| 520085 | truChIP Chromatin Shearing Kit Low Cell SDS | Process < 3 Million Cells |
| 520084 | truChIP Chromatin Shearing Kit Low Cell Non-ionic | Process < 3 Million Cells |
| 520076 | truChIP Chromatin Shearing Kit High Cell SDS | Process < 30 Million Cells |
| 520075 | truChIP Chromatin Shearing Kit Low Cell Non-ionic | Process < 30 Million Cells |
| 520083 | truChIP Chromatin Shearing Kit Tissue SDS | Process 20 mg to 120 mg of tissue |

## Let's Talk

The truChIP Chromatin Shearing Kits from Covaris give users of AFA Focused-ultrasonicators improved sensitivity, unprecedented reproducibility and compatibility with every ChIP protocol. For more information, please contact us at **chip@covarisinc.com** or visit **www.covarisinc.com/products/truchip.**

Covaris®
the pre-analytical advantage

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truChIP

SENSITIVE · REPRODUCIBLE · UNBIASED

# truChIP™ Chromatin Shearing

***with AFA™ Focused-ultrasonicators***

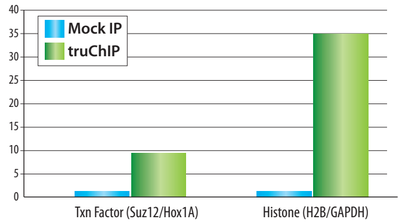
Covaris®
the pre-analytical advantage

# truChIP™ Applications

## High Cell & Low Cell truChIP

- Shear **up to 30 million cells** with High Cell truChIP Kit and investigate up to 60 targets with the same sample.
- Shear **less than 3 million** with the Low Cell truChIP Kit
- Use **less than 500,000** cells in standard ChIP assays with transcription factors and histones.
- Shearing with only **1/10th as much SDS**, sheared chromatin can be used directly in IP without dilution.
- Your choice of **SDS or Non-ionic Shearing Buffers**.

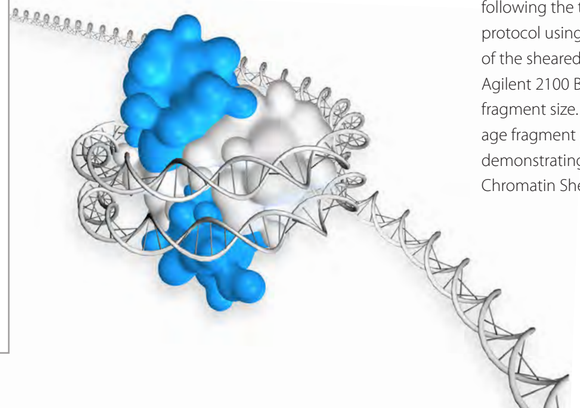
**Sensitive transcription factors and histone modification ChIP results with only 500,000 lymphoblast cells**




ChIP results obtained from 500,000 MS4221 lymphoblast cells using a S220 and the truChIP SDS Low Cell Chromatin Shearing Kit. ChIP analysis was conducted with ubiquityl-H2B and Suz12 antibodies. 5 ng of DNA from each IP was used for qPCR analysis of the GAPDH and Hox1A promoters respectively. The fold enrichment over input DNA demonstrates significant enrichment of both the common histone and rare Suz12 transcription factor with the same protocol.

## High Throughput truChIP

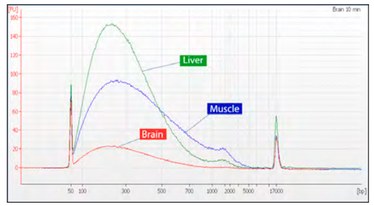
- Unique E- and LE-series systems deliver reproducible shearing in a 96 well or 8 tube strip format.
- Available integration with automated liquid handling platforms for maximum throughput.



## Tissue truChIP

- Optimized protocol for AFA utilizing 0.25% SDS shearing buffer.
- Requires as little as 20 mg or accommodates up to 120 mg of tissue.
- Reproducible shearing and ChIP results from any tissue.

**Matched shearing results from three different tissues with the same shearing protocol**




Chromatin from mouse liver, brain, and muscle tissues were fixed, prepared, and sheared in an S220 following the truChIP Tissue Chromatin Shearing Kit protocol using the same settings. The fragment size of the sheared chromatin was determined with an Agilent 2100 Bioanalyzer™ to determine the average fragment size. The traces demonstrate similar average fragment size of ~250 bp for all three tissue types, demonstrating the universality of the truChIP Tissue Chromatin Shearing Kit.

# truChIP™ Benefits

**truChIP Chromatin Shearing brings the same benefits to your ChIP assays that established Covaris as the standard for DNA shearing in Next-Gen Sequencing.**

- **Reproducible**
  Market leading AFA technology is unsurpassed in delivering reproducibly sheared chromatin.
- **Sensitive**
  Thermal control during processing preserves protein epitopes and DNA integrity, improving immunoprecipitation and DNA recoveries.
- **Unbiased**
  Mechanical shearing with AFA delivers chromatin unbiased by heat or enzymatic preference.
- **Efficient**
  Shearing provides the fragments precisely suited for your application.
- **Versatile**
  The truChIP protocols work with all mammalian cell and tissue types delivering sheared chromatin compatible with most standard downstream kits, protocols, and analytical techniques.
- **Verified**
  AFA is calibrated to NIST standards; the reproducible shearing is verifiable with the new Shearing Verification Kit.

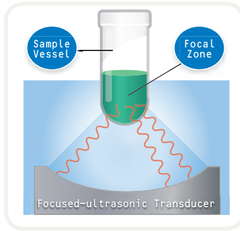
## Better ChIP Results with Covaris

***...the scientist standard***



## AFA™ Technology

Adaptive Focused Acoustics™ (AFA) is Covaris' patented acoustic technology empowering Focused-ultrasonicators to mechanically process samples. AFA employs highly controlled bursts of focused high-frequency acoustic energy to efficiently and reproducibly process samples in a temperature controlled, non-contact, and closed environment. The very high frequency ultrasound utilized in AFA results in a wavelength of only a few millimeters, enabling the acoustic energy to be focused into a discrete zone within a sample vessel. This focused and efficient delivery method requires a minimal amount of energy avoiding the adverse effects of excess energy such as damaging heat, experimental variability, and sample over-processing typical of ordinary sonicators.




Sample processing with AFA ultrasonic energy is accomplished by controlling the creation and collapse of millions of cavitation bubbles within the closed sample vessel. Acoustic energy passing through an aqueous medium causes localized pressure fluctuations which forms small cavities (or bubbles) in the regions of relative low pressure. The cavitation bubbles oscillate or grow to a critical size and then collapse. The oscillation and collapse of the cavitation bubbles generates acoustic microstreaming, which creates hydrodynamic shear stress in the sample. AFA™ Focused-ultrasonicators provide exquisite control of the acoustic bursts delivered to a sample. The tuning of peak incident power, duration, and duty factor, controls the microstreaming, and in turn the generation of shearing forces.

AFA can be precisely tuned to process samples in a variety of applications, from low-power gentle mixing of solutions and protein extraction, to higher-power applications such as DNA fragmentation, liposome formation, and the creation of nanosuspensions.