BeatBox: Tissue homogenization simplified

The PreOmics BeatBox is an evolution in high-throughput tissue homogenization. The BeatBox gives users the flexibility to process up to 96 samples in as little as 10 minutes without sample cross-contamination and minimal heat induction. The space-efficient BeatBox goes calmly and effortlessly about it's work in comparison to traditional tissue processing machines. With the BeatBox, tissue homogenization becomes seamlessly integrated into the PreOmics iST sample preparation workflow.

Technical details

Product Specifications	Description/Values
System	
Dimensions (H x W x D)	24 x 26 x 40 cm | 10 x 10 x 16 inches
Weight	5kg | 12lbs
Touchscreen	7”
Power	100 – 240 V AC, 50/60 Hz 90 VA
Operating temperature	18 – 28°C | 64.4 – 82.4° F
Operating relative humidity	15 – 75 % (non-condensing)
Method	
Homogenization intensity	Low, Standard, High (flux of homogenization)
Processing time per cycle	1 – 10 min adjustable in just two clicks
Kit	
96-well plate format with pre-installed Gyuto Beads	Up to 96 samples
Input	
Starting wet weight of the tissue	1 – 5 mg
Starting protein amount	100 – 500 µg
Volume of lysis buffer	50 – 100 µL (needs to cover tissue sample)

PREOMICS

Materials

Sample	C57BL/6 mousse tissues (1 – 2 mg) Type: Brain, Jaw, Liver, Quadricep muscle
iST LYSE 20 mL	PreOmics, P.O.00032
BCA assay	Micro BCA™ Protein Assay Kit (ThermoFisher Scientific)
Multimode microplate reader	Infinite® M plex (Tecan)

Methods

Brain, jaw muscle, liver, and quadricep muscle were harvested from mouse*, and a needle biopsy was performed to obtain 1-2 mg of tissue. Altogether, 48 specimens were collected, four biopsies per tissue type per different homogenization methodology. Each specimen was immediately suspended in 100 µL, 300 µL or 40 µL volumes of iST LYSE buffer for the BeatBox and supplier 1- and supplier 2-based homogenization methods, respectively.

Tissues were homogenized at standard setting in the BeatBox for 10 minutes. For supplier 1, ceramic beads were added to the tissues and samples were vortexed at high intensity for 10 minutes in a cold room. For supplier 2, each row (consisting of 8-wells) of the sample was sonicated for 5 minutes twice with total run time 40 min.

BCA assay was performed to measure the protein yields in every homogenate.

Results and Discussion

The BeatBox instrument will revolutionize the field of sample homogenization by its quiet performance and its ease of use. The BeatBox adds flexibility, not all wells need to be used simultaneously; 48 wells could be used on two or 24 wells on four occasions. To ensure each well is only used once, mark the plate and plate mat appropriately.

Figure 1 illustrates a comparison of protein yields obtained from mouse tissues using three different homogenization methodologies. The highest protein yields were achieved when using the Beatbox methodology. Furthermore, the reproducibility of the protein yields independent of tissue type was improved. This could be due to the fact that BeatBox homogenization does not significantly increase sample temperature and does not shake or manipulate the plate, which can lead to aerosol formation and cross-contamination.

The BeatBox achieved highly efficient soft and hard tissue homogenization by chaotic Gyuto Bead movement in the sample, as demonstrated by the protein recovery in the Figure 1.

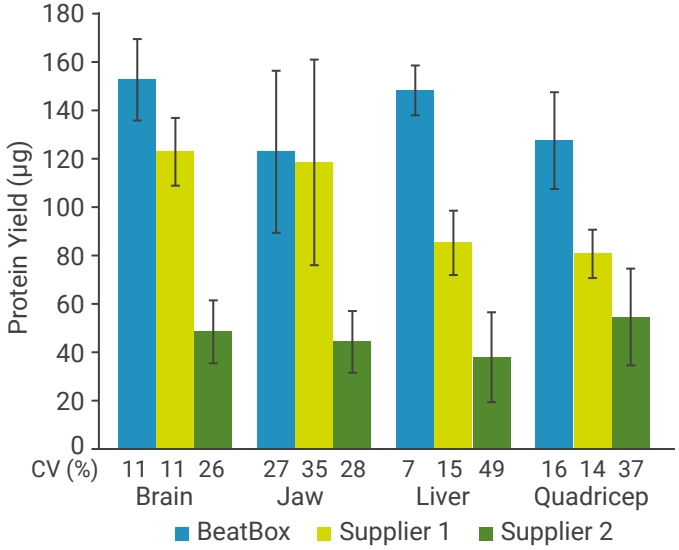

Figure 1 | **Comparison of protein yields in mousse tissues using three homogenization methodologies.** Four different mouse tissue types (n=4) were homogenized using the BeatBox and two other suppliers. The error bars represent the standard deviation.

Conclusion

The PreOmics BeatBox is reinventing the process of sample homogenization through its outstanding performance enabling the processing large sample cohorts efficiently. The unique BeatBox technology allows high-throughput sample homogenization with enhanced protein yields and improved reproducibility without sample to sample cross-contamination.

- Fast: 1-96 samples in less than 10 minutes
- Easy-to-use: Select your settings in just two clicks
- Flexible: Homogenize everything from cell pellets to tough muscle tissue
- Efficient: 96 well format and can be integrated with PreOmics iST workflows
- Revolutionary: Small footprint and very quiet
- Throughput: Compatible with available automation platforms

Products

Product	Manufacturer	Product Code
BeatBox Instrument	PreOmics GmbH	P.O.00103
BeatBox Tissue kit 96x	PreOmics GmbH	P.O.00121

*All animal experiments were performed according to the Bavarian State and Max Planck Institute's regulations for animal experimentation. C57BL/6 mouse was anesthetized and sacrificed.