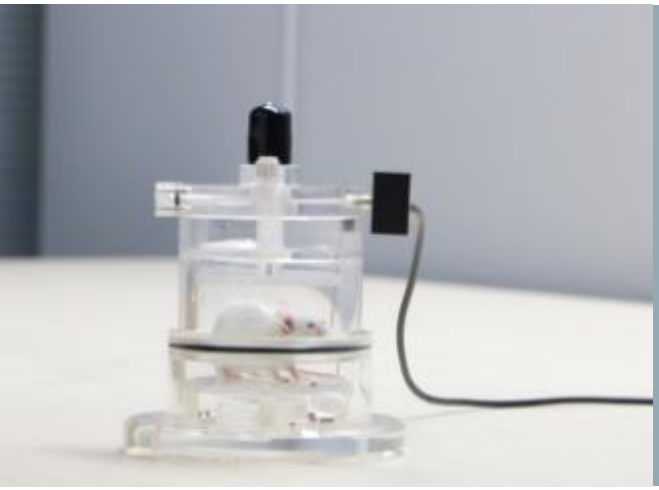
PRODUCT CATALOG

Animal System

Animal
Whole-body plethysmography
System

The whole-body plethysmography (WBP) system allows for the measurement of lung function and airway response in awake, freely moving animals. It avoids the effects of invasive tracheotomy and anesthesia, making the procedure easy and fast, and is suitable for long-term follow-up studies.



The animal is placed in whole-body plethysmograph, which is connected to a highly sensitive sensor. When the animal breathes, its thorax undulates and changes the volume of the body tracing chamber. The volume change is converted into electrical signal by pressure transducer and amplifier, and the respiratory curve is displayed on the computer screen after processing. Some respiratory parameters can be calculated, such as the tidal volume (TV), peak expiratory flow rate (PEF), respiratory rate,etc.

ADVANTAGES

Simple to operate

- No anesthesia, No surgery, Free moving.
- Anesthesia and surgery can affect the animal's spontaneous breathing.

Long-term tracking study

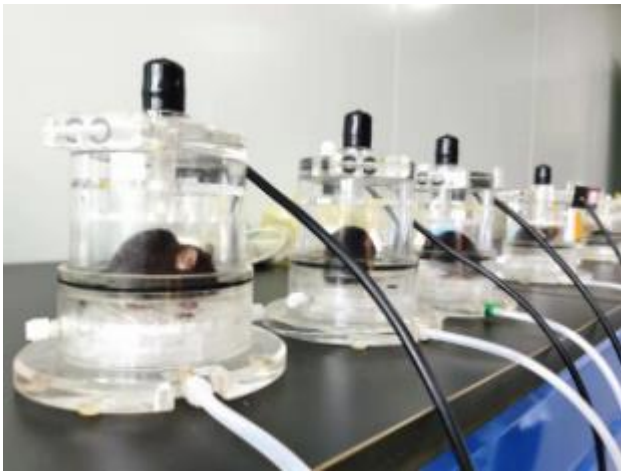
- Animals are in awake and free-moving state during measurement, this allows for long-term follow-up studies, suitable for initial drug screening

Acquire the real data

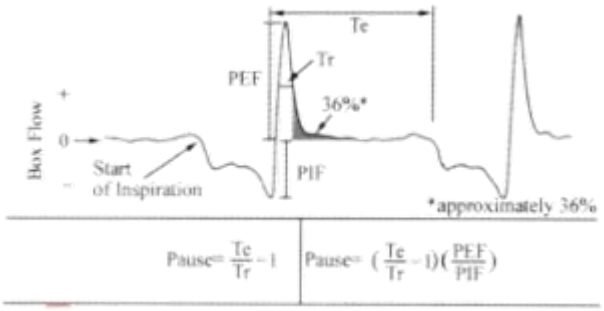
- Non-invasive method can obtain the respiratory rate, tidal volume and minute ventilation under the real spontaneous breathing. The invasive mode is the animals applied by mechanical ventilation after anesthesia surgery, so the above parameters cannot be obtained accurately.

High throughput

- A maximum of 64 animals can be monitored simultaneously.

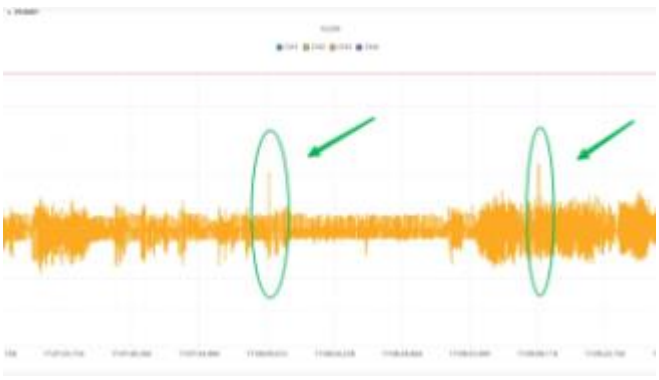


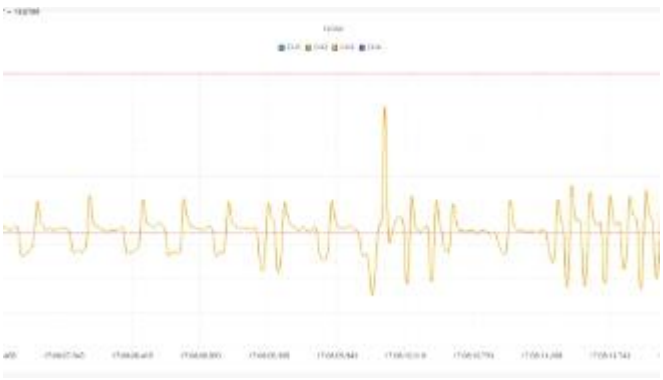
Measuring parameters



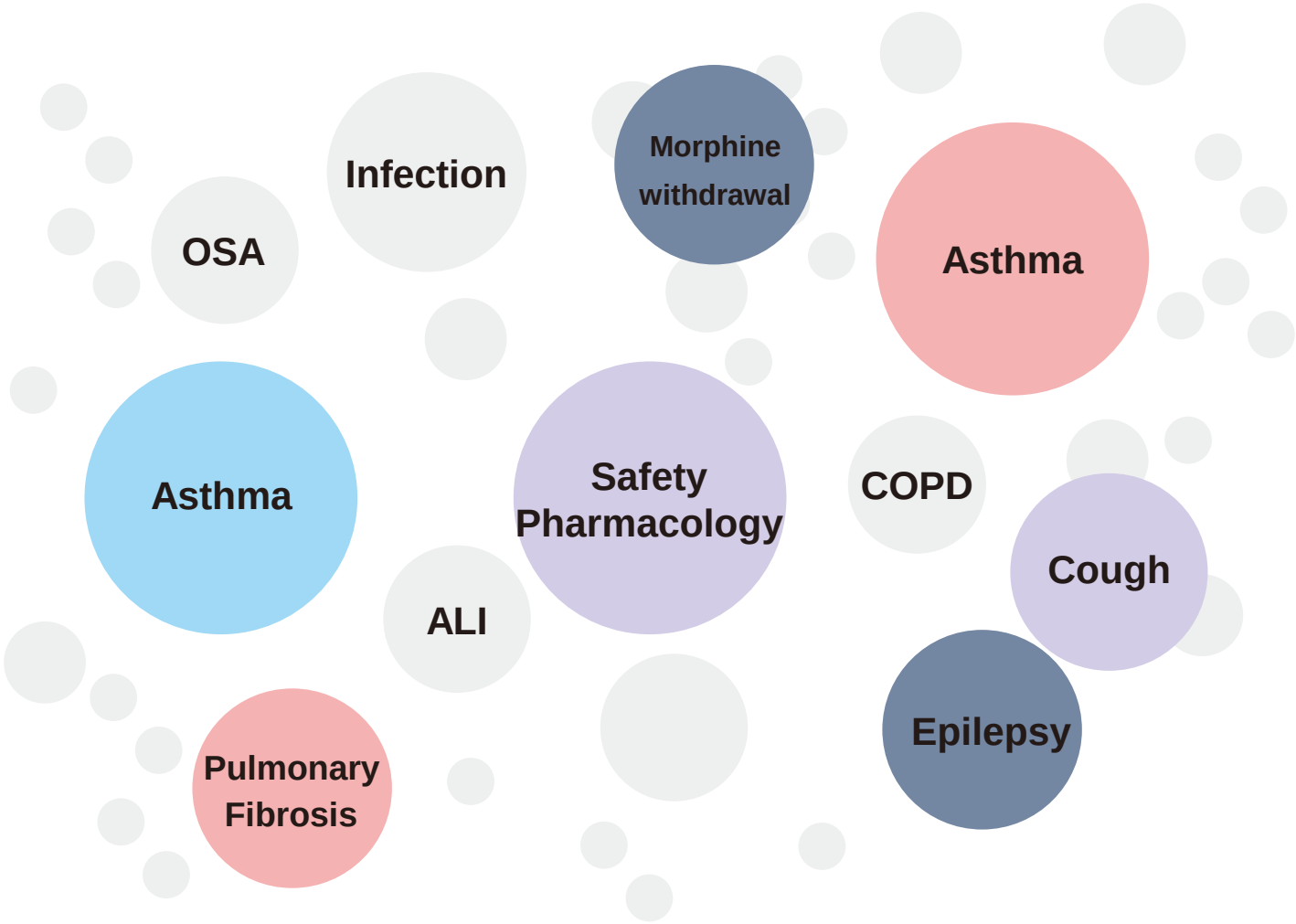
- Breath Frequency
- Tidal Volume
- Respiratory Flow
- Minute Ventilation
- Inspiratory Time
- Expiratory Time
- Peak Inspiratory Flow Rate
- Peak Expiratory Flow Rate
- End Inspiratory Pause
- End Expiratory Pause
- Relaxation Time
- Penh
- Accumulated Volume
- VO2 (optional)
- VCO2(optional)
- RER(optional)
- EE(optional)
- Other Parameters

Cough detection



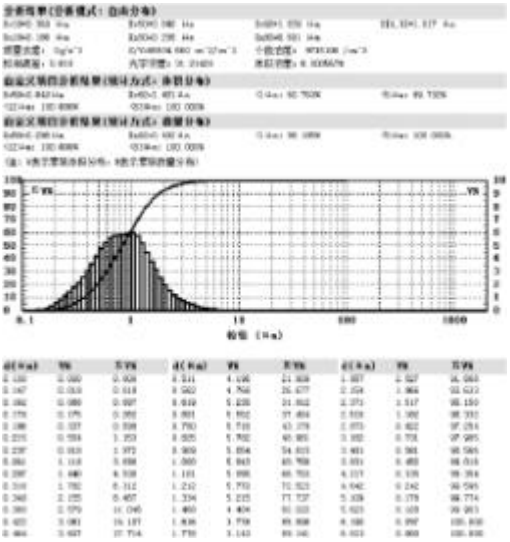


Application



Drug aerosol administration

The system can be extended to connect with a nebulizer to administer drug to the animals, this is generally used in cough and asthma studies. WBP system can detect and record the respiratory parameters and airway hyperresponsiveness during excitation. The WBP system can detect and record the changes of respiratory indexes and airway hyper-responsiveness during the excitation process, which can be used to evaluate the broncho-constriction, etc.



Software

Easy Setup

Automatic calibration
Complete calibration operations in 1 minute.

Data&Report

Each waveform data and analyzed data can be stored and exported in the format of txt, csv, pdf, jpg

Powerful

Powerful analytical capabilities, the software can perform both single-wave analysis and trend analysis, it greatly facilitates data processing

GLP Features

Control over User Permissions
Audit Trails
Electronic Signatures
Data Integrity
Electronic Signatures

Optional Plethysmographs

With water bottles and food trough, available for long-term continuous monitoring

Electrophysiology plethysmograph, for combined with optogenetic technology, EEG, EMG,etc.

Rabbit, dog, ferret plethysmograph

NHP(non-human primate) plethysmograph

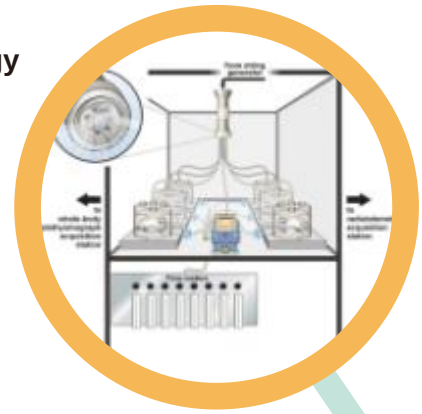
Model Selection

WBP-4/8/16-MR

- 4/8/16: Number of channels, 4/8/16 etc.
- MR: Mouse/Rat

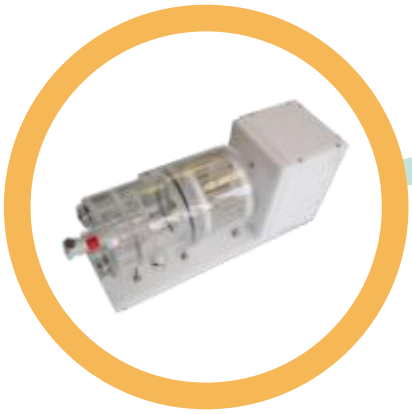
Animal
Whole-body plethysmography
System

Inhalation toxicology studies

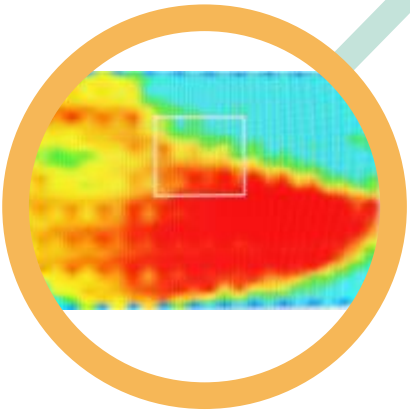


Combined with optogenetic technology, EEG, EMG,etc.

Comprehensive

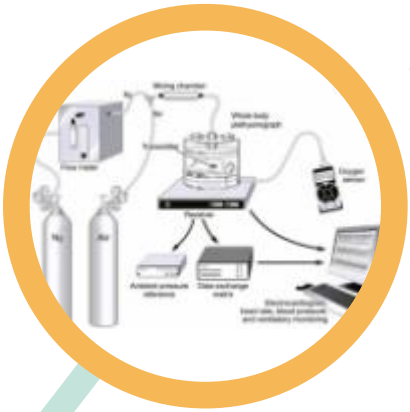


Simultaneous monitoring of animal activity and respiratory



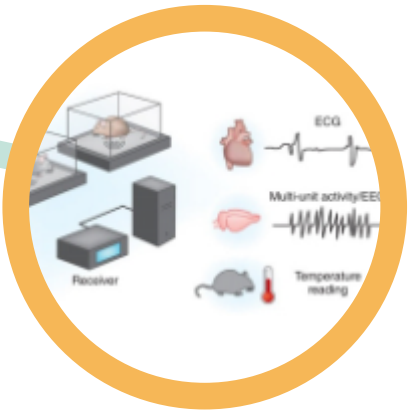
Infrared thermal imaging for shell temperature

Solutions



Hypoxic/CO_2
Ventilatory Response

Synchronized video recording



Telemetry system:
Core temperature, ECG, EEG, etc.

Continuous drug administration,
blood collection and microdialysis

*Customization is accepted according to customer experiment requirements

Publications

- Sun Lingna, Fan Mingrui, Huang Dong, Li Bingqin, Xu Ruoting, Gao Feng, Chen Yanzuo. "Clodronate-loaded liposomal and fibroblast-derived exosomal hybrid system for enhanced drug delivery to pulmonary fibrosis" [J]. Biomaterials, 2021
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- Zhang Y, Jiang M, Xiong Y, et al. Integrated analysis of ATAC-seq and RNA-seq unveils the role of ferroptosis in PM2. 5-induced asthma exacerbation[J]. International Immunopharmacology, 2023, 125: 111209.
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- Zhang X, Hu T, Yu X, et al. Human umbilical cord mesenchymal stem cells improve lung function in chronic obstructive pulmonary disease rat model through regulating lung microbiota[J]. Stem Cells, 2024: sxae007.
- Wang W, Mu M, Zou Y, Li B, Cao H, Hu D, Tao X. "Inflammation and fibrosis in the coal dust-exposed lung described by confocal Raman spectroscopy" [J].PeerJ 10:e13632
- Dongyi Zhu, Qian Zhang, Qinchuan Li, Guangxue Wang, Zhongliang Guo. "Inhibition of AHNAK nucleoprotein 2 alleviates pulmonary fibrosis by downregulating the TGF-β1/Smad3 signaling pathway" [J].The Journal of Gene Medicine, Volume24/Issue9/September 2022/e3442

*Contact us for more information.