

New PExA 2.0

# PEXA

## PExA – Particles in Exhaled Air – a unique sampling technique to collect different biomarkers from the peripheral airways.

Lung diseases often begin with pathological changes in the small airways. Today there is no non-invasive, easy to use technique to measure the status in these peripheral parts of the lung. The PExA method opens up that possibility. It gives researchers a tool to measure a whole range of different biomarkers, each one a possible disease marker or drug target. Since the technique is non-invasive the same patient can be tested repeatedly and fluctuation over time studied. In addition to clinical research the method can also be used on animals and on manually ventilated patients.

- PexA is a non-invasive method to sample particles from the peripheral airways<sup>1,2</sup>
- The composition of the sampled exhaled particles reflects the Respiratory Tract Lining Fluid (RTLFL) in peripheral airways<sup>3</sup>
- The concentration of surfactant protein A, the most abundant lung-specific protein, can be accurately measured with high repeatability in the PExA sample with ELISA<sup>4</sup>
- The protein content of PExA samples has been established in healthy<sup>3,4</sup>
- The number of PEx reflects airway closure and re-opening and is a biomarker per se<sup>1,2</sup>
- Many different potential biomarkers, in the form of phospholipids and surfactant proteins, have already been investigated using the PExA method<sup>1-7</sup>
- The method can also be applied in mechanically ventilated patients or animals.



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## Sampling procedure

1. Patient tidally breath particle free air for 2 minutes
2. Patient empty lungs and hold breath for a couple of seconds
3. Patient inhale forcefully to total lung capacity
4. Patient then exhale slowly until empty lungs during sampling collection
5. Repeat maneuver 10-20 times



## PEXA 2.0 Instrument!

PEXA 2.0 is designed for easy and non-invasive collection of particles in the human breath. Particles are quantified by size. Key components include impactor particle counter (measuring particle size), flow meters, pumps as well as soft- and hardware. The user-friendly software outlines how to calibrate, assemble and prepare for new patient. It guide through the collection procedure and how to store patient data. Flow and particle curves are visualized in real time as well as total particle count and total exhaled volume.

## Biomarker analysis

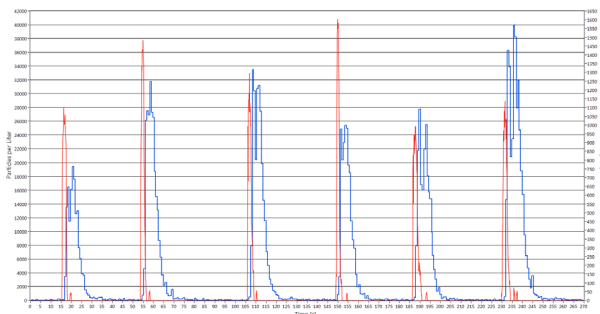
Identification of particle content can be done using different techniques such as ELISA, MS, LC & HPLC. The samples can be analyzed at your own lab using standard techniques, or sent to a qualified PEXA lab. The Department of Occupational and Environmental Medicine at Sahlgrenska University Hospital, Sweden has many years' experience in analysing PEX samples and can offer analysis of albumin and surfactant protein A. Other types of analytical methods may also be available, for more information contact PEXA AB.

### Specifications

Dimensions LxDxH:	50x50x55 cm
Weight:	Approx. 25 kg
Power Supply:	110/230 VAC

## References

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4. Bredberg A, Gobom J, Almstrand AC, Larsson P, Blennow K, Olin AC, and Mirgorodskaya E. Exhaled endogenous particles contain lung proteins. *Clin Chem* 2012; 58: 431-40.
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6. Almstrand AC, Josefson M, Bredberg A, Lausmaa J, Sjövall P, Larsson P, and Olin AC. TOF-SIMS analysis of exhaled particles from patients with asthma and healthy controls. *Eur Respir J* 2012; 39: 59-66.
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Recorded rawdata. Blue line; total number of particles.  
Red line; airflow from breath

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