



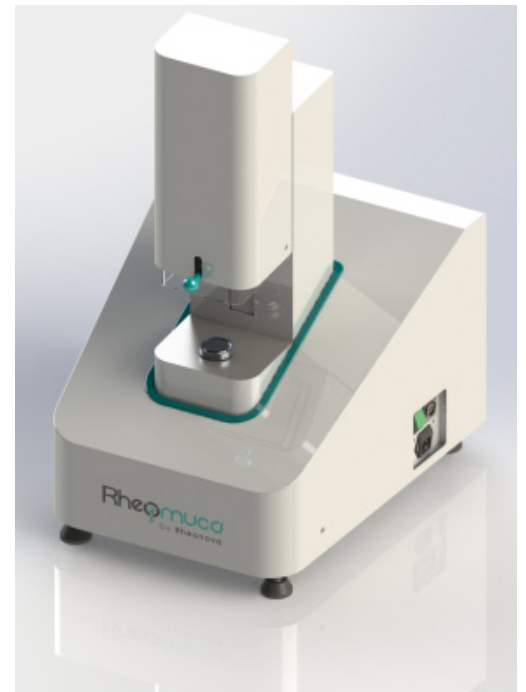
Rheomuco

## Switch to mucus analysis

COPD, cystic fibrosis, bronchiectasis and severe asthma are characterised by a modification of mucus composition and behaviour.

Rheomuco is a user-friendly device designed to perform biophysical analysis of mucus.

Our innovative equipment measures viscoelastic properties of mucus and produces in real time high-quality, easy-to-interpret data.



Rheomuco by Rheonova

### Biophysical markers for each research stage

#### Fundamental

- Physiopathology
- Drug delivery
- Pharmacodynamics

#### Translational

- *In Vitro* efficiency
- Drug benchmarking
- Medical devices benchmarking

#### Clinical trials

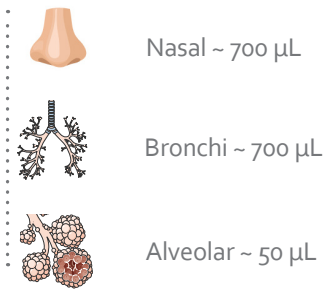
- *In Vivo* efficiency
- Dose range finding
- Secondary outcomes

Looking for new and easy way to analyse mucus?  
We are thrilled to present Rheomuco. Contact us to set-up a demo!

[contact@rheomuco.com](mailto:contact@rheomuco.com) // [www.rheomuco.com](http://www.rheomuco.com)

## Sources of mucus samples

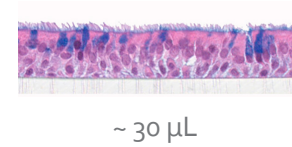
### Human



### Animal



### Epithelia cells



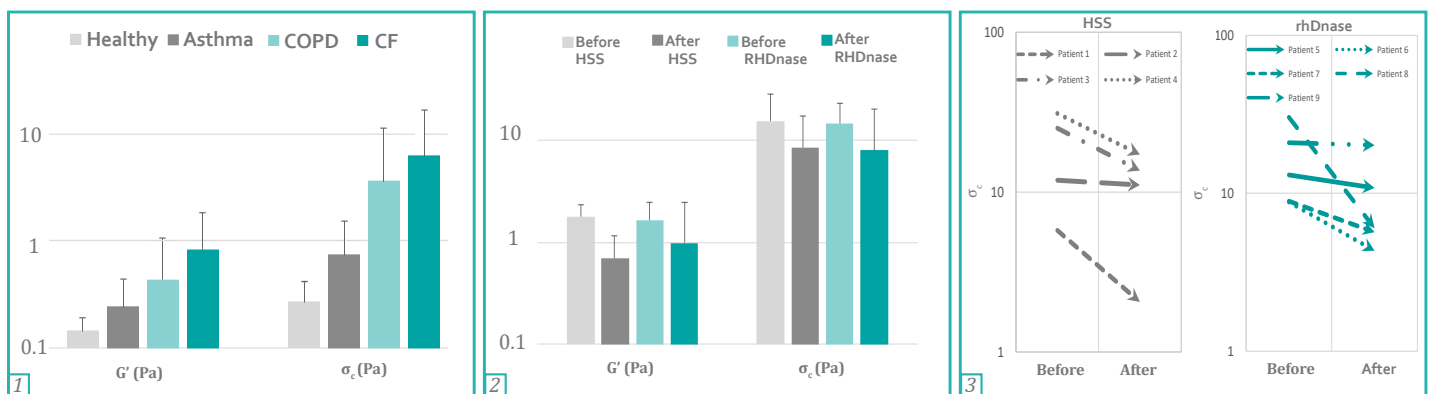
## Rheomuco: an easy-to-use device

	Rheomuco	Rheometer	Microrheology
Set-up	2-4 min		
Analysis	3 min		
Assay duration	7 min	1h	2h
Operators	Research assistant	Rheology specialist	Physics specialist
Analysis	Automatic	Manual	Computer assisted
Additional supply	No	Compressed air	Microscope

## Output Results

Viscoelastic modulus	$G^*$
• Elastic modulus	$G'$
• Viscous modulus	$G''$
Damping factor	$\tan(\delta)$
Critical strain	$\gamma_c$
Critical stress	$\sigma_c$
Elastic force (EF)	$G^* \cdot \sigma_c$

General consistency of the mucus at rest, molecular network strength  
Rigidity of the molecular structure under very low strain  
Loss of energy while the structure is moving under very low strain  
Change in the molecular configuration, independent from the density  
Springiness of the gel, the total deformation needed to start a flow  
Strength of the gel, the amount of force needed to start a flow  
Maximum storable elastic energy



Clinical trial results showed that viscoelastic properties are valuable to assess and monitor muco-obstructive lung diseases. (1) Elastic modulus  $G'$  and critical stress  $\sigma_c$  vary in sputum from healthy donors and patients with Asthma, COPD and CF. (2) Elastic modulus  $G'$  and critical stress  $\sigma_c$  allow an objective measure to assess treatment (Hypertonic Saline Solution or rhDnase) efficacy of CF patients. (3) Rheomuco is used as a diagnostic companion for individual assessment of the drug efficacy on a series of patients.

## Specifications

Type of bearings	-	Magnetic with permanent magnet
Displacement sensor	-	Optical coder
Minimum torque- Oscillation	nN.m	15
Minimum torque- Regular shear	nN.m	100
Maximum torque	mN.m	2.7
Résolution de couple	nN.m	10
Torque resolution	µHz	0.1
Maximum frequency	Hz	10
Minimum angular speed	µrad/s	1
Maximum angular speed	rad/s	720
Minimum displacement	µrad	10
Displacement resolution	µrad	6
Temperature	°C	RT to 44 (0 to 150 optional)
Dimensions (All in one)	cm	W: 41 / D: 46 / H: 57/68
Weight	kg	26

## References

- Patarin J. et al. 2020. Scientific Report
- Ma JT. et.al. 2018. Chest
- Tomaiuolo G. et al. 2014. PloS One
- Serisier D.J. et al. 2009. Respiratory Research
- Rubin BK et al. 2006. Chest
- Visit our documentation center on [www.rheomuco.com](http://www.rheomuco.com)

## An innovation signed Rheonova

Rheonova is expert in rheology of fluids for the industrial and healthcare sectors: food, materials, chemistry, pharmacy and cosmetics. Since 2010, Rheonova has been serving its customers by helping them understand the rheological properties of their products to improve formulations and claims.