

# Hemolysis assay to predict the inflammatory activity of inhaled particles

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## Organisation

**Name of the organisation** Université Catholique de Louvain (UCL)

**Department** Louvain centre for Toxicology and Applied Pharmacology

**Country** Belgium

**Geographical Area** Brussels Region

## SCOPE OF THE METHOD

<b>The Method relates to</b>	Human health
<b>The Method is situated in</b>	Basic Research
<b>Type of method</b>	In vitro - Ex vivo
<b>Specify the type of cells/tissues/organs</b>	human red blood cells

## DESCRIPTION

### Method keywords

membranolysis

red blood cells

erythrocytes

absorbance

## **Scientific area keywords**

inflammation  
inhaled particles  
lung toxicity  
silica

## **Method description**

The hemolysis assay remarkably predicts the inflammatory potential of inhaled particles. The capacity of particles to damage cellular membranes is a key property to predict their inflammatory potential upon inhalation. In macrophages and epithelial cells exposed to particles, alteration of the phagolysosome membrane is a key event for the activation of the inflammasome and the release of interleukin-1beta. The membranolytic activity of particles can easily be assessed after incubation with red blood cells and measurement of the level of hemoglobin release. This assay can be performed with human red blood cells.

## **Lab equipment**

Spectrophotometer.

## **Method status**

History of use  
Internally validated  
Published in peer reviewed journal

## **PROS, CONS & FUTURE POTENTIAL**

### **Advantages**

Easy ;  
Cheap ;  
Great predictivity.

### **Challenges**

This assay is mainly applicable to particles that are phagocytosed (low solubility).

## Modifications

None.

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### References

<https://pubs.acs.org/doi/abs/10.1021/tx400105f>

<https://particleandfibretoxicology.biomedcentral.com/articles/10.1186/s12989-014-0076-y>

<https://ehp.niehs.nih.gov/doi/10.1289/ehp.11811>

### Associated documents

[PFT\\_2014.pdf](#)

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