

Hemolysis assay to predict the inflammatory activity of inhaled particles

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SCOPE OF THE METHOD

Alternative method relates to	Human health
Alternative method is situated in	Basic Research
Type of alternative method	In vitro - Ex vivo
This method makes use of	Human derived cells / tissues / organs
Specify the type of cells/tissues/organs	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](#)

PARTNERS AND COLLABORATIONS

Organisation

Name of the organisation UCLouvain

Department Louvain centre for Toxicology and Applied Pharmacology

Country Belgium

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