Hemolysis assay to predict the inflammatory activity of inhaled particles

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SCOPE OF THE METHOD

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

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 phagocytozed (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