



# NanoMILE Scientific Protocol

## Characterisation of NMs by means of TEM

Written by:

Sophie M Briffa, Iseult Lynch and Eugenia Valsami-Jones<sup>1</sup>

<sup>1</sup> University of Birmingham

Edited by:

Iseult Lynch and Eugenia Valsami-Jones



## **Contents**

<b>1: Name(s) of scientific protocol.....</b>	<b>3</b>
<b>2: Scope and Domain.....</b>	<b>3</b>
<b>3: Principle of the scientific protocol.....</b>	<b>3</b>
<b>4: Description of the scientific protocol.....</b>	<b>3</b>
<b>5: Environment.....</b>	<b>3</b>
<b>6: Biological and/or environmental models used.....</b>	<b>3</b>
<b>7: Chemicals and reagents used.....</b>	<b>3</b>
<b>8: Nanoparticles used.....</b>	<b>3</b>
<b>9: Apparatus and equipment used.....</b>	<b>3</b>
<b>10: Health and Safety Precautions.....</b>	<b>4</b>
<b>11: Data Analysis and Reporting the data .....</b>	<b>4</b>
<b>12: Abbreviations.....</b>	<b>4</b>
<b>13: Limitations of the protocol .....</b>	<b>4</b>
<b>14: Publications.....</b>	<b>4</b>
<b>15: References.....</b>	<b>5</b>

**1. Name(s) of scientific protocol:**

Characterisation of NMs by means of TEM.

**2. Scope and Domain:**

Size and morphology characterisation of project NMs by means of TEM.

**3. Principle of the scientific protocol:**

To determine the size and morphology of NMs by means of TEM.

**4. Description of scientific protocol:**

Samples were prepared on copper grids coated with a thin film of holey carbon (Carbon film on 300 mesh Copper grids 3.05 mm) using the drop method. This involves placing a drop of sample on the surface of the grid which was held stationary and suspended by means of TEM tweezers. The drop was allowed to stand on the grid for a period of half an hour to an hour to allow the nanomaterials to adhere to the surface of the grid. Following this the grids were gently dipped repeatedly in ultrapure water to remove any loose material and excess salts from the grid. The grids were allowed to air-dry and kept covered to prevent any contamination from taking place. Imaging was carried out by means of a JEOL 1200EX TEM (accelerating voltage 80 kV). Image J was used to analyse the data. In order to obtain a size distribution plotted as a histogram, at least 100 particles of each sample had to be analysed using this software.

**5. Environment:**

Benchtop.

**6. Biological and/or environmental models used:**

N/A

**7. Chemicals and reagents used:**

N/A

**8. Nanoparticles used:**

All project NPs.

**9. Apparatus and equipment used:**

Carbon film on 300 mesh Copper grids 3.05 mm

JEOL 1200EX TEM

**10. Health and Safety Precautions:**

The protocol should follow Control Of Substances Hazardous to Health (COSHH) standards, and general health and safety precautions apply.

**11. Data analysis and Reporting the Data:**

Image J was used to analyse the data. In order to obtain a size distribution plotted as a histogram, at least 100 particles of each sample had to be analysed using this software.

**12. Abbreviations:**

Control Of Substance Hazardous to Health – COSHH

Transmission Electron Microscopy – TEM

**13. Limitations:**

N/A

**14. Publications:**

N/A

**15. References:**

N/A