

Project 4

Size and size distribution number of synthetic virus-like particles

Objectives

The aim of this work is to provide a comparability dataset for a size distribution number of virus like particles (VLPs), and support the characterisation of VLPs as reference materials. The study will use de novo synthetic VLPs with proven ability to traverse human cells. The target measurands for the study are:

N - number of VLPs per μm^2

D - Feret's diameter

R - roundness

Measurements are performed using high resolution microscopy.

Background

The development and commercialisation of advanced medicinal products requires suitable reference standards and materials to benchmark the performance of innovative products (2007/1394/EC).

Bio-functional particles with reproducible physicochemical profiles and proven ability to transfect live cells are attractive candidates in this regard.

A correlative relationship between their size number, transfection efficacy, genetic response and cell viability are envisaged to underpin a quantitative measure of macromolecular and gene transfer into live cell.

However, both such a measure and associated reference materials are lacking.

Standardization needs

The pre-standardisation needs focus on:

- protocols for the preparation of virus-like materials
- assigned values consistent between laboratories and using different techniques (e.g. TEM, AFM, DLS)
- procedures for quantitative analysis of the values by reproducible measurements of the highest metrological order
- performance validation of reference materials in biologically native and near-native environments.

Relevant guidelines and standards

CHMP/GTWP/671639/2008

ISO Guide 35 Reference materials

SO 29301: 2017

ISO 13022:2012

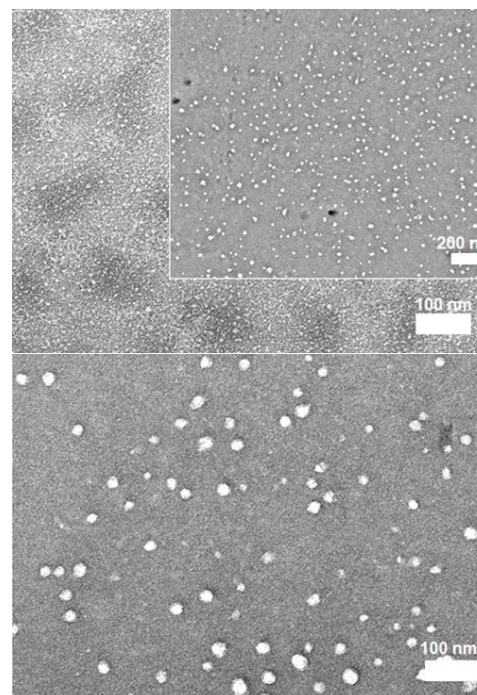
Relevant Committees

ISO/TC 276—Biotechnology

ISO/TC 229—Nanotechnology

ISO 15194: 2009—CRMs

Call for Participation



Electron micrographs of VLPs.

Second stage analysis

- Measurement protocols that give accurate distribution numbers of VLPs per grid area (μm^2) will be used for correlative imaging, e.g. a size distribution number in live or microtomed cells.

Knowledge Transfer

International round-robin tests, good practice guidelines, peer-review publications and presentations in conferences and standardisation venues.

Status

Study in progress since August 2018.

Additional Volunteers Welcome

Participants fund their own study in the project

Work Programme

- Synthetic VPLs are fixed on grids for electron microscopy.
- The grids are distributed to individual participants with instructions for imaging and analysis.
- Analysis of the results with full uncertainty evaluation is performed by each participant.
- Repeatability and reproducibility of the measurement results is then tested from a smaller group of participants.

For more information on participation, please contact:

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