NANO
Research Infrastructure

GLP Training School

Practical Exercise: Compiling a study report

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NILU

A pan-European Infrastructure for Quality in Nanomaterials Safety Testing

CAPACITIES

Study Report

Study report is the document which reflects the **conduct** and **conclusions** of the non-clinical health and environmental safety study.

The final report may be regarded as a **mirror image of the study plan**.

Corrections and additions to the final report should be in the form of **amendments**.

GLP aims to ensure that the contents and conclusions of a study report can be **trusted and used confidently** in the assessment of product safety when submitted to a Regulatory Authority.

Study Report

Contributing reports of Principal investigator or scientists involved in the study are signed and dated by them.

By signing the final study report the **Study Director** indicates acceptance of responsibility for the validity of the data, and GLP compliant conduct of the study.

Inclusion of the **GLP Statement by the QA** provides the final recognition that the report reflects the raw data, and the pertinent rules of GLP have been observed during inspections.

Content of the study report

1. **Identification of the study, test substance and reference substance**
   - Descriptive title
   - Identification of the test substance
   - Identification of the reference substance(s)

2. **Information concerning the sponsor and test facility**

Names and addresses of the sponsor, any test facilities and test sites involved, the Study Director, Principal Investigator, and scientists having contributed reports to the final report.

3. **Dates**
   - Experimental starting and completion dates

4. **QA Programme Statement**
   - List of types of inspections made with dates
   - Confirmation that the raw data are reflected in the report

Content of the study report

5. Materials and Test method description

- Reference to (OECD) Test Guideline or method to be used
- Justification for selection of the **test system**
- Characterization of the test system

- **Test substance**
  - Identification and registration
  - Characterization of the test substance, including purity, stability, homogeneity, and concentration *vs.* nominal values
  - Preparation of test solutions
- **Reference substance(s)**
  - Identification of positive and negative control substances
  - Preparation of control solutions

- Method and conditions of **exposure**
- Dose levels, frequency, duration of exposure

Content of the study report

5. Materials and Test method description (continued)

- **Experimental design**, including
  - Chronological procedure of the study
  - Materials and methods
  - Type and frequency of analysis, measurements, observations and examinations performed
  - Statistical methods
- **Acceptance criteria** of the study
- Interpretation of the results

Content of the study report

6. Results

- Summary of results
- All information and data required by the study plan
- Presentation of the results, including statistical evaluations
- Discussion of the results, and conclusions

7. Archives

Location where the study dossier (study plan, amendments and deviations, draft report, copy of final report and attached documents, original raw data, copy of product registration forms), samples of test and reference substances, and specimens are stored.

8. References

Practical study example

Study objective:

Cytotoxicity testing of fluorescent SiO_2 nanoparticles (25 nm) in in-vitro cultured mammalian cells using the plating efficiency test

Sample material of the study according to GLP priciples

(kindly provided by NILU):

- Study report: Plating efficiency testing of fluorescent red silica nanospheres (25 nm)(Study code: GLP11PE001)
- Standard Operating Procedure (SOP): Plating efficiency testing (HEL11T001, v1.0)

Study example: Cytotoxicity testing of fluorescent SiO_2 nanoparticles (25 nm)

CERTIFICATE OF ANALYSIS

Product	Fluorescent red silica nanospheres
Catalog number	1234
Product ID	Red SIO/0.025
Batch number	C25
Date of manufacture	09/2009
Solid concentration, mg/ml	49
Media-Preservatives	DI water-None
Mean particle size, nm	24nm (Brookhaven ZETAPALS)
Polydispersty index	0.136
Particle composition	SIO2-Rhodamine B
Surface chemistry	Plain
Charge Density (µeq/g)	N/A
Parking area ($Å^2$)	N/A
Surface area, m^2/g	N/A
pH	Not measured

Date of Issue September 29, 2009
Store at 4ºC – DO NOT FREEZE

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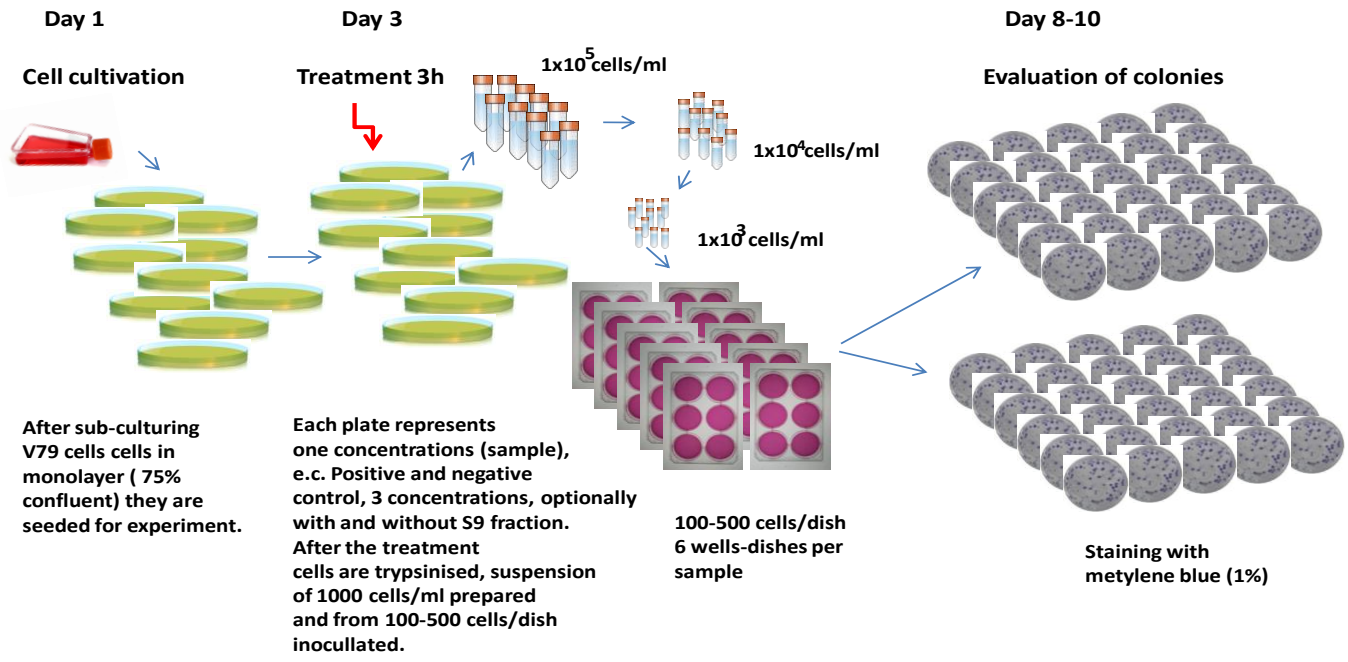
Study example: Cytotoxicity testing of fluorescent SiO_2 nanoparticles (25 nm)

SOP Plating Efficiency test (HEL11T001, v1.0)



Practical exercise

The final study report should contain

"**characterization of the test substance**, including purity, stability, homogeneity, and concentration *vs.* nominal values"

Practical exercise:

*Which **physico-chemical parameters of nanomaterials** would be relevant and sufficient to comply with this requirement?*

Practical exercise

Physico-chemical characterization of nanomaterials in safety studies:

- Purity
  - Elemental analysis
  - Surface modification, e.g. biomolecule corona, endotoxin
- Homogeneity
  - Size distribution
- Stability
  - Chemical analysis to measure nanomaterial dissolution
  - Size distribution to determine aggregation
- Concentration
  - Number/mass/volume concentration
- Other?
  - Surface area, surface charge, shape, …

Documentation

OECD Principles on Good Laboratory Practice, Number 1 (1998)

OECD Advisory document of the working group on GLP: The application of the principles of GLP to *in vitro* studies, Number 14 (2004)

Good Laboratory Practice- the Why and the How. Jürg P. Seiler. Springer-Verlag Berlin Heidelberg 2005. ISBN 3-540-25348-3