**The LightCycler® 480 Real-Time PCR System**

**Equipment:** LightCycler® 480 II

**No. of Equipment: IEM11**

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**Equipment Description**

The LightCycler® 480 System is a plate-based, highly adaptable and versatile real-time PCR system for gene expression analysis, SNP genotyping, and mutation scanning via high resolution melting (HRM).

Key benefits of the LightCycler® 480 Thermal Block Cycler:

- Run any assay format or application with fast PCR protocols (< 40 minutes for 40 cycles in 384-well plate format).

- Obtain rapid and accurate temperature adjustment.

- Achieve exceptional data homogeneity across the entire multiwell plate.

**Specifications and technical features:**

Block cycler unit Easily interchangeable 96-/384-well format Includes Therma-Base

Reaction volumes 5 μl – 20 μl (384-well), 10 μl – 100 μl (96-well)

Temperature control Peltier-based heating/cooling from 37°C – 95°C

(20°C starting temperature to perform specific melting curve analyses)

Heating rate 96-well block: 4.4°C

384-well block: 4.8°C

Cooling rate 96-well block: 2.2°C

384-well block: 2.5°C

Excitation Broad-spectrum, high-intensity LED (390 – 710 nm)

Detection Simultaneous, scan-free detection of signals from all wells

with telecentric optic and monochrome CCD camera

Filters Excitation (nm): 440, 465, 498, 533, 618

Detection (nm): 488, 510, 580, 610, 640, 660

Computer Pentium PC with Windows 7

Preinstalled software • Tm Calling

• Absolute Quantification Analysis

• Relative Quantification Analysis

• Endpoint Genotyping

• Melting Curve Genotyping

Accessory software • Gene Scanning Module for HRM Analysis

Automation • Interface with LightCycler® 480 LIMS Interface Module

• Barcode assisted multiwell plate scanning

• Plate loading capability

Data management 21 CFR Part 11 compatibility

Maintenance and ROX calibration not required

**Applications:** Gene Expression analysis

SNP Genotyping

Mutation scanning via high resolution melting (HRM)

**Specification of expertise relevant to NanoEnviCz workpackage**

**WP3**a,d,f,g,h, **WP4**a,b, **WP6**a,d, **WP7**a,c,e,h,i, **WP9**a,b,c,d

**Detailed description of expertise**

**Please, specify the main research topics connected with equipment**:

The LightCycler® 480 Real-Time PCR System is an instrument primarily used in nanotoxicology. It allows the analysis of genotoxicity of nanomaterials by measuring the changes in gene expression levels.

**Please, specify the secondary research topics connected with equipment**:

The system may be used in toxicology in general, or in any application that requires analyzes and monitoring the levels of nucleic acids, particularly mRNA.

**Keywords describing research area:**

gene expression, toxicity, genotoxicity, biological effects of nanomaterials, nanoparticles

**Competence**

**Relevance for applied and industrial research:**

Versatile real-time PCR system applicable for detection of toxic effects of new materials.

**Relevance for fundamental studies:**

Analyzes of mechanisms of effects of xenobiotics, including nanomaterials, at molecular level with the aim to identify possible negative response of the organism to the exposure to these compounds and materials.