**Complete infrastructure for mammalian cell cultivation and related experiments**

**Equipment:** Complete infrastructure for mammalian cell cultivation and related experiments: **Biohazard box class 2** (Alpine), CO2 cell incubator (Esco), **inverted fluorescence microscope** (Olympus IX71), **flow cytometer Attune** NxT (Invitrogen)

**No. of Equipment:** UJEP21

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**Equipment Description**

**Description of equipment:**

Complete infrastructure for mammalian cell cultivation and related experiments

Specifications and technical features:

*Biohazard box class 2 (Alpine), CO2 cell incubator (Esco), inverted fluorescence microscope (Olympus IX71), flow cytometer Attune NxT (Invitrogen)*

*Biohazard box class 2 (Alpine)*

Biohazard box for protection of samples and operators according the EN 12469:2000 approved for work with cytostatics and potentially toxic chemicals

Dimensions: 1960х1260х790 mm

Filters: 3 HEPA filters with efficiency 99,999% for particles 0,3 µm, carbon filter according the DIN 12980

Illumination: UV and white light

*CO2 cell incubator (Esco)*

Filters: SteriSafe™ ULPA filtration enables the chamber air to be maintained at ISO class 5 condition

Decontamination: SwiftCon™ moist heat 90oC decontamination cycle

Material: electro-galvanized steel with ISOCIDE antimicrobial

*Inverted fluorescence microscope (Olympus IX71)*

Basic characterization: illumination by LED system (CoolLed) and/or mercury lamp, set of optical filters, objectives, software cellSense

Optical filters: U-MNUA2 - Excitation filter BP 360-370, Dichromatic mirror DM 400, Emission filter BP 420-460

U-MCFPHQ - Excitation filter BP 425-445, Dichromatic mirror DM 450, Emission filter BP 460-510

U-MWIBA3 - Excitation filter BP 460-495, Dichromatic mirror DM 505, Emission filter BP 510-550

U-M39004 - Excitation filter AT540/25x EX (527-552), Dichromatic mirror AT565DC BS, Emission filter AT605/55m EM (578-633)

Objectives:LUCPlanFL N 20x/0.45 , LUCPlanFL N 40x/0.60 , UPlanFL N 4x/0,13 , UPlanFL N 10x 0.30 , LCAch N 20x/0.40 PhC , LCAch N 40x/0.55 Ph2 , CPlan N 10x/0.25 PhC

*Flow cytometer Attune NxT (Invitrogen)*

Excitation: Laser power: blue laser 488 nm, 50 mW; violet laser 405 nm, 50 mW;red laser 637 nm, 100 mW

Emission: Forward scatter: Photodiode detector with 488/10 nm bandpass filter

Side scatter: PMT with 488/10 nm bandpass filter

Emission filters: User-changeable, keyed filters

Up to 14 color channels with PMTs

Fluidics: Sample rates: 12.5–1,000 µL/min

Sample delivered by positive displacement syringe pump for volumetricanalysis

Sample analysis volume: 20 µL to 4 mL

Sample tubes: Accommodates tubes from 17 x 100 mm to 8.5 x 45 mm

Performance: Data acquisition rate: up to 35,000 events/sec

Particle size range: 0.5–50 µm

Fluorescence sensitivity:≤80 MESF for FITC, ≤30 MESF for PE, ≤70 MESF for APC

Fluorescence resolution: CV <3% for the singlet peak of propidium iodide–stained CEN

Optimized to resolve lymphocytes, monocytes, and granulocytes in lysed whole blood

**Specification of expertise relevant to NanoEnviCzworkpackages:**

**WP3** a, c, d, h, **WP7** g, **WP9** a-d

**Detailed description of expertise**

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

**Nanomaterials for biomedical applications**

Dendrimers (carbosilane, PEI, PAMAM, dendrimer-protein hybrid nanoparticles, dendrimer-nucleic acid complexes (dendriplexes))

Nanofibres (biodegradable electrospun nanofibers, drug encapsulation, biocompatible nanoscaffolds)

Model transfection studies (siRNA, plasmids) by novel nanoparticle vectors

**Please, specify the secondary research topicsconnected with equipment**:

**„In vitro“toxicity tests – cytotoxicity, genotoxicity, interactions with membrane**

Nanoparticle cytotoxicity, viability studies, mechanisms of nanoparticle/cell interactions

**Microfluidics for biomedical applications**

Cultivation of cells in microfluidic chips, development of novel technology for cell cultivation and cytotoxicity studies

**Keywords describing research area:**

Cytotoxicity, nanomaterials, microfluidics

**Competence**

**Relevance for applied and industrial research:**

Studying the biocompatibility in vitro of novel nanofibrous materials for wound dressing applications

**Relevance for fundamental studies:**

Studying the mechanisms of cytotoxicity of novel nanomaterials

Novel nanoparticle vectors for gene therapy applications

Microfluidic devices for cell culturing and analysis