**Laser scanning confocal microscopy (LSCM)**

completed by responsible coordinator of equipment

**Equipment: LSCM (Laser Scanning Confocal Microscopy )**

**No. of Equipment:** *UPOL 15*

**Responsible coordinator: Dr. Kateřina Poláková**

**Name of Institution: Palacký University, Olomouc**

**Address of Institution: RCPTM- CATRIN, Šlechtitelů 27, 783 71 Olomouc**

**E-mail: katerina.polakova@upol.cz**

**Telephone: (+420) 58 563 4473**

**Homepage: rcptm.services@upol.cz**

**Contact person: Dr. Kateřina Poláková**

**E-mail: katerina.polakova@upol.cz**

**Telephone: (+420) 58 563 4473**

**Equipment Description**

**Description of equipment:**

The laser scanning confocal microscopy instrument with Airyscan 2 includes options for fast imaging with improved resolution. Suitable applications include live cell imaging/time courses, colocalization studies, Photo-activation, FRAP, FRET, spectral imaging, stitching of large areas and imaging of fixed samples.

CLSMs enabling fast multiplexed super-resolution imaging (2x increase in spatial resolution) at 4x faster speed, especially suitable of dynamic live-cell imaging, containing linear scanner and enabling fast imaging 13images/second with resolution (512 x 512 pixels). It contains plan-apochromat objectives: 10x/0.45 M27 [working distance (WD) 2.1mm], 20x/0.8 M27 (WD 0.55mm) with DIC, 40x/1.2 Imm DIC M27 (WD 0.41mm) immersion: water, silicone oil or glycerol, 63x/1.4 Oil DIC M27 (WD 0.19mm) , incubator XL multi S2 Dark premium with incubation set CO2/O2 and temperature heating desk, antivibration table, ZEN 3.3 system with ZEN modul FRAP, spectral 32 channel GaAsP PMT and 2 channels MA-PMT detectors. The confocal microscope covers the whole spectra with lasers (405, 445, 488, 514, 543,594 and 639nm).

**Specification of expertise relevant to NanoEnviCz workpackages:**

**WP3**a,c-f,h, **WP4**a,b, **WP5**a,c, **WP6**a,f **WP7**a-e,h-i, **WP8**d

**Detailed description of expertise**

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

Live science, live cell imaging, interaction of nanoparticles with cells

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

Cytotoxicity, drug delivery systems, nanomedicine

**Keywords describing research area:** cell imaging, nanomedicine, cytotoxicity

**Competence**

**Relevance for applied and industrial research:**

Safety/cytotoxicity assessment of nanomaterials is basic and crucial aspect for the future application of nanomaterials in various research fields. The equally important issue is the understanding of interaction of cells with various nanomaterials potentially useful in nanomedicine as contrast agents or drug delivery systems.

**Relevance for fundamental studies:**

Confocal microscopy imaging is important complementary technique to basic cytotoxicity assays based on molecular biology methods. The resolution and sensitivity enable to understand subcellular changes by imaging them compared to biochemical analysis and all together results increase the basic knowledge about how nanomaterials interact with cells, their internalization pathways, uptake and biodegradability within the cells.

