**Spectrofluorometer FluorMax 4**

**Equipment:** Spectrofluorometer FluorMax 4 (Horiba Scientific)

**No. of Equipment: UJEP25**

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**Equipment Description**

**Description of equipment:**

Specifications and technical features:

Spectrofluorometr dedicated for wide range of optical fluorescence measurements, including fluorescence polarization anisotropy analysis.

Key technical parameters:

The Source: Vertically mounted 150 W Ozone-free xenon arc lamp. The xenon source that supplies prime UV performance is focused onto the entrance slit of the excitation monochromator with an elliptical mirror.

The Slits: Continuously variable from 0 to 30 nm, Accuracy 0.5 nm, Repeatability 0.1 nm, minimum step 0.0525 nm, Integration time 0.001 to 160 sec. The slits themselves are bilaterally, continuously adjustable from the computer in units of bandpass or millimeters.

The Excitation Monochromator:

1200 groove/mm blazed at 330 nm (excitation). The excitation monochromator is an aspheric design which ensures that the image of the light diffracted by the grating fits through the slit. The wavelength drive scans the grating at speeds as high as 80 nm/s.

The Reference Detector:

Photodiode reference detector monitors the intensity as a function of time and wavelength.

The Sample Chamber:

Thermostated sample chamber with mixing.

The Emission Monochromator:

1200 groove/mm blazed at 500 nm (emission), plane ruled. All features of the excitation monochromator are also incorporated into the emission monochromator. Gratings are blazed to provide maximum throughput in the visible region.

The Emission Detector:

R928P photon counting PMT (185-850 nm) and reference photodiode for monitoring lamp output. Emission detector electronics employ photon-counting for the ultimate in low-light-level detection. Photon-counting concentrates on signals that originate from fluorescence emission, ignoring smaller signals originating in the detector tube (PMT).

Computer Control:

The entire control of the FluoroMax originates from FluorEssence™ software and is transmitted through a USB link.

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

**WP3**c**,**d, f-h, **WP4**a, **WP6**b, **WP7**g, **WP8**a, **WP9**a-e

**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))

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

Interaction of nanoparticles with proteins, nucleic acids and model lipid bilayers

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

Characterization of optical properties of nanoparticles and optically active thin layers

**Keywords describing research area:**

Fluorescence, nanoparticles, proteins, nucleic acids, polymers, lipids

**Competence**

**Relevance for applied and industrial research:**

Studying of optical properties of nanoparticles and optically active thin films

**Relevance for fundamental studies:**

Studying the mechanisms of cytotoxicity of novel nanomaterials

Novel nanoparticle vectors for gene therapy applications

Mechanisms of nanoparticle-protein/nucleic acid/lipid interactions