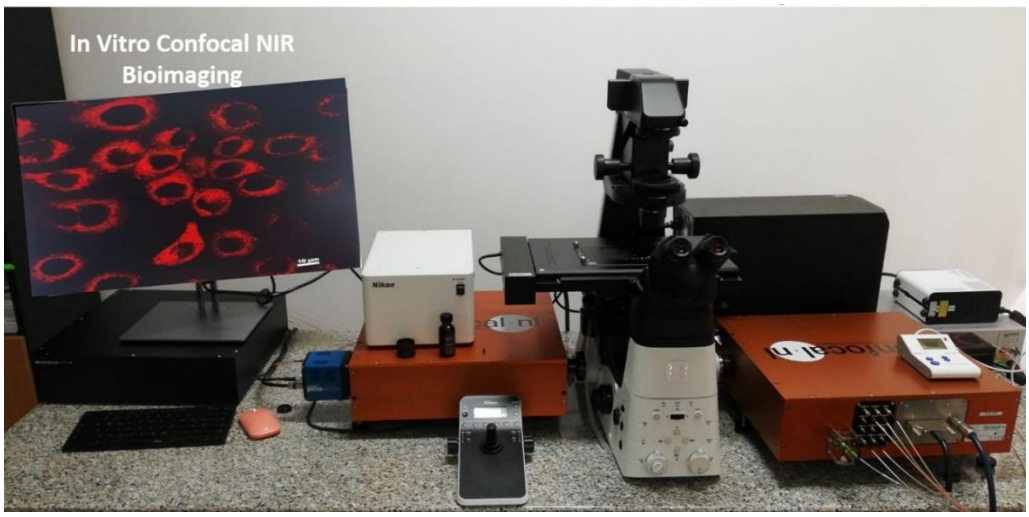
Re-Scanning Confocal Microscopy system (RCM, Confocal, Holland)



► **Specific components:** TI2-E inverted microscope (Nikon) equipped with NIS Elements software (version 5.12); 2 re-scanning RCM units: for the NIR domain, with lateral resolution of 240 nm (RCM-NIR) and 140 nm respectively for the visible domain (RCM-VIS); the RCM-NIR unit is equipped with two laser diodes with emission lines at 640 and 785 nm, respectively, and a Hamamtsu Orca Flash 4.0 v3 CCD camera; the RCM-VIS unit is equipped with three laser diodes with emission lines at 405, 488 and 561 nm respectively and a PCO EDGE 4.2 CCD camera; epifluorescence extension with the following LED light sources in tandem with appropriate filters: white LED lighting system (Cooled pE300 lite MXCL0021) and 770 nm LED, DAPI filter - DAPI-50LP, FITC filter - FITC-3540C, Filter - MCHERRY -40LP, LED Filter - LED-Cy5, ICG-B Filter; Microscopy objectives: CFI Plan Apochromat Lambda 10x, CFI Plan Apochromat Lambda 20x, PA L 40x, CFI Plan Fluor 40x NA 0.75 Ph2, CFI Plan Apochromat Lambda 60x oil, CFI Plan Apochromat Lambda 100x oil; active pneumatic anti-vibration table.

► **Performances:** This confocal microscopy system (Re-scan Confocal Microscopy - RCM) is based on the "double scan" method (a scan of the laser beam simultaneously with a scan of the beam emitted by the sample). This innovative method leads to obtaining a much better lateral resolution than in standard confocal microscopy (the working principle of the RCM is presented at https://www.confocal.nl/. This peculiarity of scanning and respectively high resolution gives to our microscopy system a high degree of uniqueness both nationally and internationally; **Characteristics of RCM-VIS unit (visible range)**: Maximum scanning speed: 1 fps at 512x512 maximum resolution (RCM resolution) / 4 fps at 512x512 through the binning process (low resolution); Resolution: 170 nm (no deconvolution); Pinhole size: fixed, 50 µm; Field of view: 88 x 88 µm at 100x magnification; **Characteristics of RCM-NIR unit (near infrared (NIR) range):** Maximum scan speed: 1 fps at 512x512 maximum resolution (RCM resolution) / 4 fps at 512x512 binning (reduced resolution), Field of view: 88 x 88 µm at 100x magnification

► **Applicability:** High-resolution confocal fluorescence (bio)imaging RCM, respectively epi-fluorescence microscopy on biological systems (cells, tissue, "phantoms") or luminescent materials in Vis-NIR of interest in medicine, biology, photonics, materials science, etc.; investigation of fluorescent molecules, nanoclusters and nanoparticles; investigating the distribution of fluorescent markers in living cells of

interest at a high spatial resolution; collection of 3D images from cells, tissues, phantoms, etc.; automatic multi-mode image acquisitions.

► **Total value:** 1.160 488 Lei (system, 2020), 260.530 Lei (accesories, extensions 2021)

► **Aquisition year:** 2020 + auxiliary equipments (2021)

► **Availability for Access and Use**

Contact person:

Monica Focşan, CS I (email: monica.iosin@ubbcluj.ro, 0264454554 /int 116)

Available for a pre-evaluation of the complexity of the samples and estimation of the working time, in the **9:30 - 17:30 interval**, based on a preliminary email or phone appointment.

Usage conditions: exclusively by the personnel responsible for the mentioned specialty.

Analysis price - extern UBB: : Preliminary evaluation – free of charge; Recording and analysis of confocal fluorescence image: 350 lei/sample; Recording and analysis of 3D confocal fluorescence: 500 Lei /sample

Analysis price - intern UBB: free of charge