

## CONFOCAL MICROSCOPY SERVICE

### **DESCRIPTION OF THE TECHNOLOGY**

The goal of the CIPF Optical and Confocal Microscopy Service is to provide infrastructure and technical support to CIPF researchers and users from other research institutions and companies, for the observation and analysis of different samples (cells, tissues and materials). The service offers different optical microscopy systems covering a wide range of applications:

- Fluorescence Microscopy.
- Confocal Microscopy.
- TIRF Microscopy (Total Internal Reflection Fluorescence).
- Live Cell Microscopy.
- Microinjection.

Furthermore, the service provides software for image processing and result analysis.

### **MARKET APPLICATION SECTORS**

Application method and use in companies from the biomedical or food sector, or any other company that might need microscopic analysis of materials and/or surface studies.

### **TECHNICAL ADVANTAGES AND BUSINESS BENEFITS**

Below we can see some examples of the multiple studies that can be carried out by optical and Confocal microscopy, and that can meet the requirements of the companies mentioned in the previous section.

#### **Biomedicine**

##### *Cellular cultures*

- Fluoride co-tracking, for example, for interaction and/or tracking of protein studies.
- Immunocytochemistry and immunohistochemistry studies.
- Biomaterials cell growth study.
- Protein interactin studies and conformational changes by FRET (Fluorescence Resonance Energy Transfer).
- Morpholocial and co-tracking studies by high resolution microscopy, with an accuracy of up to 140 nm.
- Cytotoxicity studies, change in mitocondrial activity, drugs internalisation, etc.
- Physiological mechanisms studies such as: cell communication, membrane components mobility, interaction among proteins, changes in its conformation, etc. by FRET (*Fluorescence Resonance Energy Transfer*), FRAP (*Fluorescence Recovery After Photobleaching*) and FLIP (*Fluorescence Loss in Photobleaching*).
- $\text{Ca}^{+2}$ ,  $\text{Na}^{+}$ ,  $\text{Mg}^{+2}$  intracell variation kinetics.
- Mobility and cell migration studies.

##### *Tissues*

- Fluoride co-tracking studies.
- Immunocytochemistry and immunohistochemistry studies.

#### **Materials**

- Volumetric analysis of hydrocarbons fluids inclusions.
- Morphology or defects analysis in solids such as microelectronic components, polymers, resines, minerals, ceramics, metals, etc. As well as the surface and roughness profiles study. This is applied to several fields such as: Engineering (quality control, corrosion analysis, etc.), paleontology, forensic medicine, geology, dental and osseous implantology, etc.



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### Food

- Processed food microstructural characterization.

### CURRENT STATE OF DEVELOPMENT

The service is fully functional and includes the following technology:

- Confocal microscope (Leica TCS-SP2-AOBS) equipped with 9 laser lines allowing excitation from 405nm to 633nm), 4 detectors for simultaneous data acquisition, CO<sub>2</sub> and T<sup>a</sup> control system for live cell studies and analysis software for FRET, FRAP y FLIM.
- Confocal and multiphoton (Leica TCS-4Pi) for high resolution microscopy, equipped with 7 laser lines allowing excitation from 478nm to 633nm, 1 multiphoton laser allowing excitation from 720nm to 900nm and 4 detectors for simultaneous data acquisition.
- Inverted fluorescence microscope (Leica DM6000B) equipped with a TIRF system (Total Internal Reflection Fluorescence), CO<sub>2</sub> and T<sup>a</sup> control system for live cell studies
- Inverted fluorescence microscope (Olympus IX81) equipped with a CO<sub>2</sub> and T<sup>a</sup> control system for live cell studies
- Upright fluorescence microscope (Leica DM6000B).
- Inverted fluorescence microscope (Leica DM6000B).
- Upright fluorescence microscope (Zeiss Axioscop2).
- Inverted fluorescence microscope (Zeiss Axiovert200M).
- Microinjector Zeiss.
- MetaMorph® image analysis software

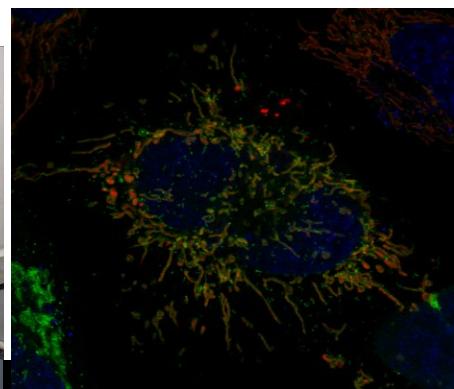
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N/A

### COLABORATION SOUGHT

Joint participation in research projects and scientific and technical services delivery to companies, research institutions and universities.

### RELATED IMAGES





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