Ultrastructural & Functional Morphology

UNIVERSITÀ
DI SIENA
1240

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DEPARTMENT: LIFE SCIENCES

LAB: ADVANCED ELECTRON MICROSCOPY TECHNIQUES FOR HIGH RESOLUTION IMAGING OF CELL, TISSUES & NANOMATERIALS

Research activity

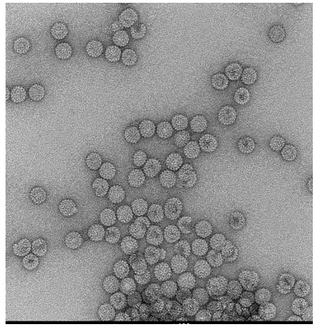
The resarch activities are dealing with high resolution electron microscopy studies on the functional morhology of eukariotic cell organelles with particular focus on cell motility and control of the cell cycle.

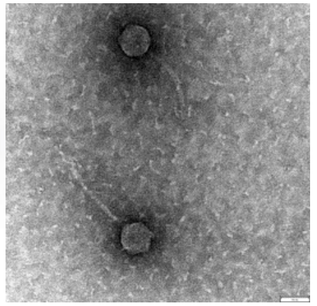
The research group has a well established international reputation on the use of advanced electron microscopy techniques for high resolution characterization of biological samples and nanomaterials of biomedical and biotech interest.

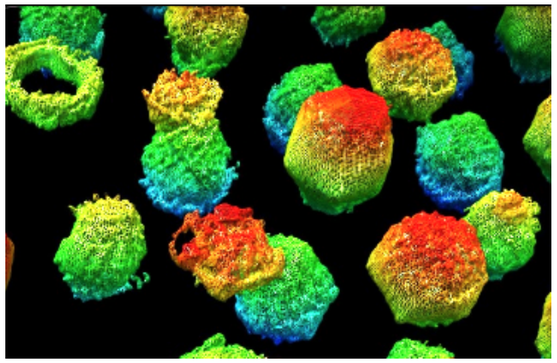
In order to perform such analyses, the laboratory is fitted with all the intrumententations for sample processing, and conventional imaging at room temperature, or cryoEM.
3D modeling of imaged structures can then be performed by either electron tomography or single particle strategies.

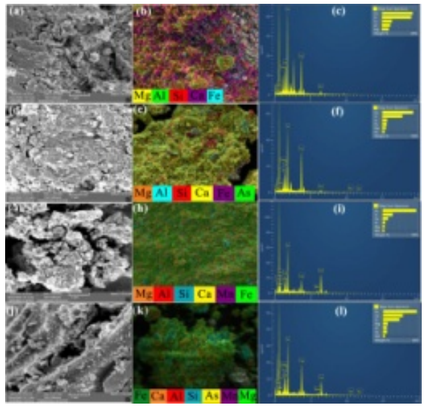
Elemental anlyses can also be perfomed by EDS spectrometry on both SEM and TEM microscopes.

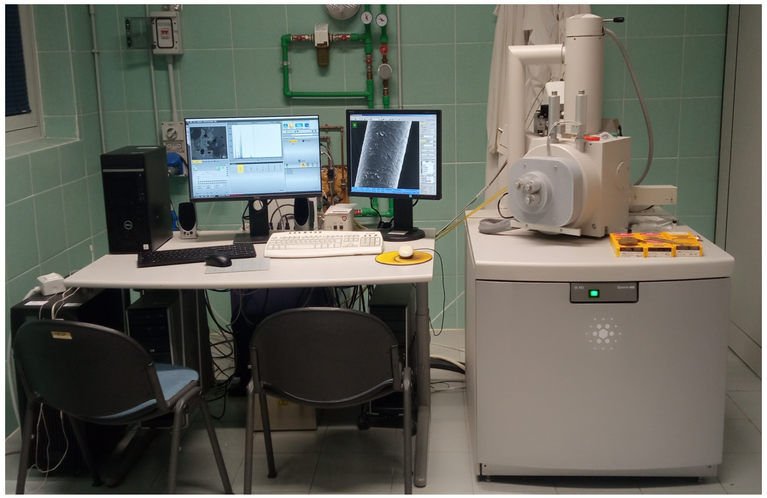
Images











Technologies and services

The facility is equipped with most of instrumentations functional to sapmple processing necessary for high resolution imaging by both transmission and scanning electron microscopy. Namely, ultramicrotomes, ultrarapid plunge freezers, glow discharge, metal sputtering, critical point drying units.

Surfaces imaging and elemental anaylses can be performed by an ESEM FEI Quanta 400 fitted with a Thermofisher EDS microanalisis set

High resolution imaging and elemental analises on nanomaterials can be performed on a FEI Tecnai F20 FEG TEM fitted with Gatan Tridiem energy filter, HAADF detector, STEM, and Aztec Energy system, EDS-SDD X max detector.

A CryoEM Thermofisher Talos F200C G2 will be installed in april 2024 and will repalce the currently on duty Philips CM200 FEG

The facility can provide high resolution imaging and 3D modeling of biological samples and nanomaterials of interest in cell biology, biomedicine, biotechonologies and material sciences

Applications and collaborations

The ultrastructural and functional morphology facility performed high resolution imaging and 3D models of biological samples i.e. cells, cell organelles, macromolecules and nonstructures of interest in biotech and material sciences areas under commitment by the following customers and collaborating research units:

Exosomics, Lonza, Achille's vaccines, Abich s.r.l, Biosynth, BSP Pharma, Plumestars srl, GSK Vaccines, Tecnotessile, CNR Milano Prof. Chiari, CNR Napoli IBP Prof. Luini, CNR Napoli Prof. Manzo, CNR Bologna Prof. Curcio, Politecnico Torino Prof. Sartori.

For more information

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