

ELECTRON MICROSCOPY

DESCRIPTION OF THE TECHNOLOGY

Electron microscopy technology offers the possibility of carrying out studies, using the transmission electron microscope (TEM).

TEM is a powerful tool that allows to obtain high magnification and high resolution images of ultrastructure from biological samples. The main applications of TEM are:

- Observation of the ultrastructure of the cell.
- Enhancement and supplement for other histological techniques in the clinical diagnosis of some pathologies, especially for kidney, muscular, dermatological and peripheral nerves diseases.
- Observation of the structure and morphology of viruses, bacteria, microvesicles, proteins and some chemical compounds.
- Cryo-TEM studies for the characterization by freezing of microparticles (viruses, polymers, microvesicles, etc.) and study them in their native state.
- Study of the morphological and structural effects induced by different compounds and drugs in cell culture lines.
- Characterization and identification of stem cells in different tissues.
- Molecular characterization of histological cells and tissues by Immunogold Techniques.
- Study the function of proteins, analyzing the morphological alterations in histological tissues, in absence or overexpression of that protein

MARKET APPLICATION SECTORS

- Pharmaceutical and biotechnological companies.
- Public or private hospitals that require diagnostic support in kidney, muscle and peripheral nerve diseases.
- Private research foundations.

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The Cryo-TEM unit is the most exclusive technique of the Service, because it is the only one with these characteristics in the Valencian Community. By using this technique, different microparticles (polymers, microvesicles, viruses, etc.) can be visualized without the need of pre-fixation or sample processing, only freezing is necessary. This allows the observation of the microparticles in their native state.

In addition, TEM is the reference technique for observation and characterization of exosomes and microvesicles, which are very popular currently. These microparticles play an important role in cell communication, and they are being studied for their possible involvement in diseases like cancer.

Therefore, any pharmaceutical and biotechnological company that are working in this type of studies, might be interested in the use of TEM for a better characterization of them.

CURRENT STATE OF DEVELOPMENT

The service has all the equipment and protocols, to develop these techniques:

- Transmission Electron Microscope (FEI, Thermo Fisher Scientific, Tecnai Spirit Biotwin model) with Digital Camera (Soft Image System, Morada model) and an image acquisition software.
- Cryo-TEM unit with a Grid Plunger (Leica EM GP model) equipment for the vitrification of the samples, and a cryogenic specimen holder (Gatan 626 model) for carrying out studies with frozen samples directly in the TEM.
- An Ultramicrotome (Leica UC6 model) with cryo-chamber accessory for freeze cutting, for the realization of ultrathin sections.
- Blade making machine for ultramicrotomy (Leica EM KMR2 model).



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• In addition, the protocols for the right sample preparation have been developed, such as: embedding techniques in resins and ultrathin sections of tissues and cell cultures, negative stains and immuno-gold for molecular characterization of microvesicles.

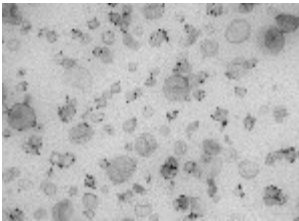
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COLABORATION SOUGHT

Joint participation in research projects and provision of scientific and technical services to companies, research organizations and universities.

RELATED IMAGES



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