

CLEM microscopy technique. Optical-electron microscopy correlation.

DESCRIPTION OF TECHNOLOGY

CLEM technique (correlation light electron microscopy) is a combination of the capabilities of two microscopy platforms that normally work separately: optical microscopy (or fluorescence, in this case, FM) and electron microscopy (EM).

FM has the advantage that it can provide wide-field images of cells (even living cells) and histological tissues, but it has limited resolution. EM has the advantage that it can provide higher resolution images, even at the molecular level, but in more specific regions and never in living cells.

In order to study the same sample at different length scales and to be able to analyze various aspects of the complex organization of cells, the great potential of the CLEM technique can be used. The technique allows the correlation of the two different types of information on the same area of interest: the cellular function provided by FM and the ultrastructure provided by EM.

Therefore, CLEM combines the advantages of both techniques, allowing scientists to detect dynamic cellular structures and processes in whole cell images with FM, and then zoom in to obtain a more detailed view with EM.

The process begins with imaging the fluorescent areas of interest with FM. The area is then marked using a laser microdissector that effectively marks the support where the cultured cells are located. This will facilitate future correlation and detection to the EM of the cells of interest imaged with the MF. Subsequently, the samples are prepared and included in resins for ultra-fine cuts that allow them to be introduced and studied in the EM. Finally, the study of the cells of interest to the EM is carried out using as a reference the images captured with the MF, arriving to correlate both types of images. This combined double information provides much greater information than each of the techniques can provide separately.

MARKET APPLICATION SECTORS

- Public or private research entities for basic research.
- Biotechnology companies for a broader study of their applications.
- Pharmaceutical companies for a better understanding of the results of therapeutic treatments.

TECHNICAL ADVANTAGES AND BUSINESS BENEFIT

- Study of the same region of cellular interest at a functional and structural level.
- Trace the location of a molecule for therapeutic purposes to better understand its effects.
- Study of the relationship and interaction between cells for the optimization of treatments.
- Characterization of molecular markers, function and location.

CURRENT STATE OF DEVELOPMENT

CLEM technique constitutes a consolidated technological platform in continuous evolution.

INTELLECTUAL PROPERTY RIGHTS

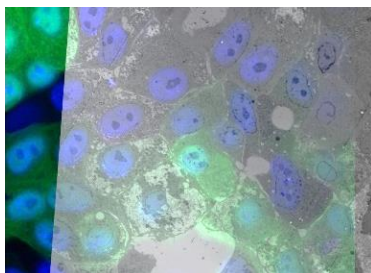
- Industrial Secret.

COLABORATION SOUGHT

Basic and applied research projects at national and international level, as well as provision of services related to available technologies.

Biotechnology or pharmaceutical companies that need a more detailed study at the subcellular level of the effects of treatment with molecular markers or therapeutic polymers.

RELATED IMAGES



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