HOW TO MAKE CORRELATIVE EXPERIMENTS SIMPLE

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Fluorescence microscopy excels at labeling components of the cellular machinery with unmatched sensitivity and specificity; however, it lacks any contextual information. Providing full morphological information at the ultra-structural level is the strength of electron microscopy. If the very same sample is imaged by fluorescence and electron microscopy it is possible to merge dynamics, label specificity and nanometer resolution. Although a powerful approach, it is challenging and low-throughput.

FEI has recently introduced new solutions to overcome these experimental hurdles: CorrSight, a dedicated light microscopy system offering CLEM-specific functionality and automation of important workflow steps; MAPS, a software tool bridging the modalities to increase ease of use; and iCorr, a light microscope module integrated into the Tecnai family of transmission electron microscopes. These tools address different correlative workflows helping to optimize efficiency and data quality across the full range of CLEM experiments.

CorrSight is an innovative light microscope providing unprecedented solutions to optimal sample support for different workflows in correlative light and electron microscopy. One of its strengths is the possibility to perform live cell imaging, event-triggered fixation and subsequent processing of the sample for electron microscopy. On top of it a dedicated cryo stage allows contamination-free imaging of vitrified samples with the highest resolution.

MAPS also allows for correlation of light microscopy data captured on any light microscope with EM data acquisition on the full range of FEI SEMs / SDBs. To allow utmost flexibility in the choice of the light microscope, there is absolutely no dependence on any special hardware – correlation is carried out only on image data. Thus, existing or specialized light microscopy setups can be easily used for CLEM experiments and correlation can be carried out on any feature visible in both modalities. When coupled with CorrSight the correlation is possible without manual intervention.

In order to perform correlative experiments between LM and TEM imaging FEI has developed an integrated light and electron microscope: iCorr. This tool provides fast and effortless navigation for correlative experiments.