

Leica Microsystems

Rare event detection with Autonomous Microscopy powered by Aivia and Coral Life workflow for Live Cell CLEM

Presenters:

Jürgen Reymann, Product Manager Imaging Software, Leica Microsystems CMS GmbH

Robert Kirmse, Manager Scientific Innovation, Leica Microsystems CMS GmbH

Abstract:

Localization and selective imaging of objects of interests or rare events is key for the investigation of many processes in biological samples. Yet, due to time constraints and complexity, many experiments are not feasible which limits the horizon for new discoveries.

Conventional imaging follows the constant interaction of an operator, searching for suitable objects or regions of interest (ROIs) on the sample, with the microscope and making appropriate optimal acquisition settings to decisively scan these ROIs. With such a manually defined workflow, only a manageable number of ROIs can be precisely localized, while acquisition requires a lot of time.

Autonomous Microscopy for STELLARIS allows a highly economical operation for advanced experiments that would not be possible without automated procedures or considerable manual effort.

In this workshop, we will present rare event detection workflows based on AI-powered microscopy that offers the potential to overcome the limitations by the synergistic fusion of an intelligent sample navigation, image-acquisition, and AI-powered image analysis by Aivia.

In electron microscopy (EM), many workflows start with sample fixation followed by sample preparation and EM imaging. However, relevant cells are often rare and identifying them in EM images can be time-consuming and tedious.

The live-cell CLEM workflow allows you to capture dynamic information related to a relevant biological process under a light microscope as it happens and put these observations into their ultrastructural context by combining the light microscopy live cell data with information coming from electron microscopy. The Coral Life workflow streamlines this process to optimize performance and increase productivity.

For rare events in live cell CLEM, we will give you an overview of the Coral Life workflow and its components and invite you to join us for a demonstration at the EMBL Imaging Centre after the workshop or at a convenient time during the symposium.