Séminaire ibs

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Conférencier invité

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A 11h - Salle des séminaires de l'IBS

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Fluorescence localization microscopy – the transition from concept to biological research tool

Localization microscopy techniques are super-resolution fluorescence imaging methods based on the detection of individual molecules. Despite the relative simplicity of the microscope setups and the availability of commercial instruments, localization microscopy faces unique challenges.

It has been three years since *Nature Methods* pronounced super-resolution fluorescence microscopy, or nanoscopy, as the Method of the Year in 2008 (Nature Methods, 2009, 6, p1). Since its invention, the technique of localizing individual fluorescent molecules has been extended to live cell, multi-color and 3D imaging and manufacturers are now offering user-friendly, fully integrated instruments (e.g. Nikon's N-STORM, Zeiss' Elyra PALM, Leica's SR GSD and Applied Precision's imminent instrument called Monet). Despite these recent advances, we only scratched the surface of what localization microscopy could achieve for the biological sciences. To record biological process on the single molecule level will give a whole new meaning to the very concept of molecular biology. Localization microscopy is the closest we have to place the world of proteomics into a cellular context, potentially allowing us to quantify number of proteins in time and space and hence assign function to individual molecules.

While achieving super-resolution is no longer a problem, the question we have to ask ourselves is whether localization microscopy images can be 'trusted' to reveal novel biological insights. Here, we discuss the similarities and differences between the various localization microscopy concepts with a special focus on dSTORM. We outline why data analysis and the design of test samples may hold the key to harness the full potential of localization microcopy for cell and molecular biology.

Hôte : Virgile Adam(IBS/DYNAMOP)