

ELYRA – THE NEW SUPERRESOLUTION PLATFORM BY CARL ZEISS

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KEY WORDS: superresolution, photoactivated localization microscopy, structured illumination microscopy

Biomedical research is moving towards an ever more refined molecular understanding of complex cellular processes. For this reason, imaging of organelle substructure, macromolecular complexes and even single molecules with a size from 20 to below 200nm has become a daily need for many scientists. While this range is and has always been accessible by electron microscopy, many scientific issues require fluorescence imaging because it has molecular specificity and preserves an aqueous sample state.

Concepts to overcome the diffraction limit to classical light microscopy have been developed since the 1960s, but have remained at an experimental stage until recently. Over the past decade, a stunning technological progress has taken place as many of these techniques have reached maturity. Today, superresolution light microscopy is rapidly becoming an established segment of the high end light microscopy market.

As superresolution light microscopy undergoes its final skinning from breadboard setup to mass-manufactured commodity, Carl Zeiss MicroImaging is ready to provide industry-leading solutions. We believe that the demands on these solutions will be as multi-faceted as they are elsewhere in modern light microscopy. Consequently, our ELYRA superresolution systems have interfaces for a variety of superresolution techniques as well as for tried and true methods such as laser scanning microscopy. ELYRA combines two powerful superresolution techniques: structured illumination light microscopy and photoactivated localization microscopy (PAL-M). This talk will cover the principles of operation of this new instrument, its integration in the Carl Zeiss hard- and software world and describe its usability in various applications.