

R tools for spatial point pattern analysis applied to fluorescence localization nanoscopy

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Emerging super-resolution optical microscopy techniques (usually referred as nanoscopy) capable of operating beyond the diffraction limit give now access to cell images with unprecedented levels of details [1-3]. These breakthrough technologies are particularly suitable to study the localization of fluorescent nano-objects within the cell environment [4]. Localization nanoscopy can image biological samples with high molecular densities while maintaining the localization accuracy of single nano-particles. But if localization nanoscopy can be routinely performed on conventional fluorescence microscopes, the challenge is now to offer data analysis facilities allowing a straightforward translation from single molecules detection to biological insights. Here we propose few application examples using the point pattern analysis tools developed in R [5] to highlight their ability to extract valuable and biologically relevant information on nanoparticles distribution in the intracellular organelles. Taken together, coupling latest imaging techniques and R data-analysis facilities holds the promise to go one step further in the understanding of biological structures and dynamics.

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