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Visualization and tracking of tumor exosomes using single molecule localization based super resolution microscope

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Exosomes are cell-derived microvesicles presented in body fluids. The diameter of exosomes is around 30-100 nm. Exosomes play an important role in intercellular communications, exchanging of substances and diagnostic drug delivery. Recently, despite increasing scientific and clinical interest in exosomes, the moderate resolution of conventional optical microscopy limits the accurate localization and intracellular tracking of exosomes. Herein, we realize the application of single molecule localization based super resolution imaging technique (PALM/STORM) in the imaging and tracking of cancer derived exosomes. Firstly, successful extraction of cancer-derived exosomes from culture media are conducted and confirmed. Then labeling and imaging of exosomes membrane receptors are accomplished with photo-switchable probes. Moreover, simultaneous dual-color PALM imaging of the cancer derived exosomes is also presented. The most remarkable characteristic of this method is its excellent spatial resolution for exosomes observing at scales down to the nanometric level. Moreover, we demonstrate that cancer exosomes taken up by normal cells can be more precisely visualized through the presented PALM/STORM strategy. In addition, we also realize dual color PALM/STORM imaging of exosomes and lysosomes, which more vividly confirm the intracellular localization and accumulation of exosomes. The presented results indicate that PALM/STORM imaging is a powerful tool for the study of exosomes mediated cancer metastasis.

Biography

Chen Chen is a PhD candidate in Southeast University. Currently, she is working on the mechanism of intercellular communication between cancer derived exosomes and cells using single molecule localization based super resolution microscope.

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