Improvement in Resolution of Laser Capture Microdissection Using Near Field Probe to Capture Nano-particles

李仁愛
Chen CM*;Lee JA;Yen CF

Abstract

PURPOSE: A modified laser capture microdissection (LCM) system is developed to improve resolution to 400 nm, using a laser light (808 nm) transmitted by a near-field tip probe. MATERIALS AND METHODS: Using a 150-nm aperture to heat an ethylene vinyl acetate (EVA) film, melted spots on the average of 400 nm in diameter are generated on the underlying target composed of a 20-nm gold-particle monolayer. The near-field tip probe composed of fiber is set on a 2-D nanometer piezoactuator (PZT) for precise capturing of the monolayer of gold particles. The monolayer of gold particles under the target is bound to the EVA film using a laser, while the remaining EVA film stays on the monolayer. RESULTS: The diameter of the melted spots as small as 400 nm are produced and details are provided that demonstrate the feasibility of the nanooperation of this new LCM system. CONCLUSION: The new LCM system successfully captures nanoparticles and improves resolution of microdissection to 400 nm. With this LCM system, the isolation of a single organelle or bacterium is possible.