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### ACCEPTED MANUSCRIPT

# Effect of Island Shape on Dielectrophoretic Assembly of Metal Nanoparticle Chains in a Conductive-Island-Based Microelectrode System

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#### **ABSTRACT**

The electrical conduction quality of an electric circuit connection formed by dielectrophoretic (DEP)-assembled metal nanoparticle wires between small conductive elements plays a significant role in electronic devices. One of the major challenges for improving the electrical conductance of nanowires is optimizing their geometric morphology. So far, the electrical conduction quality has been enhanced by optimizing the AC frequency and conductivity of nanoparticle suspensions. Herein, the effect of the conductive island shapes on the dynamic process occurring in a DEP assembly of 10 nm gold nanoparticles was investigated in a conductive-island-based microelectrode system. The nanoparticle wires between the microelectrodes were assembled *in situ* from colloidal suspensions. The wires were grown in a much straighter route by increasing the geometric angle of the conductive-island tip. To

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