Abstract Submitted
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Nanoscale molecular traps[1] CHIA-FU CHOU, QIHUO WEI, JIAN GU, FREDERIC ZENHAUSERN, Arizona State University, NATHAN SWAMI, University of Virginia — We have constructed nanoscale molecular traps using electrodeless, or insulator-based, dielectrophoresis [1, 2]. The molecular traps consist an array of nanoscale dielectric constrictions defined using electron-beam lithography on nanofluidic passages. The device was then sealed using an extremely simple room-temperature sealing process with virtually no pressure applied. Upon the application of an external ac electric field, the field will be focused at the constrictions and high field gradient can be generated to trap molecules dynamically in aqueous solutions. We demonstrated the trapping of small protein molecules in an array of these nanoscale molecular traps down to 50 nm in size. [1] C.F. Chou, J.O. Tegenfeldt, O. Bakajin, S.S. Chan, E.C. Cox, N. Darnton, T.A.J. Duke, R.H. Austin (2002). "Electrodeless Dielectrophoresis of Single and Double Stranded DNA", *Biophys. J.* **83**, 2170-2179. [2] C.F. Chou, F. Zenhausern (2003). "Electrodeless Dielectrophoresis for Micro Total Analysis Systems", *IEEE Eng. Med. Biol.*, Nov./Dec., 62-67.

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Chia-Fu Chou
Arizona State University

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