

### DIRECT-WRITE DIP-PEN NANOLITHOGRAPHY OF ACTIVE PROTEIN NANOSTRUCTURES

J.-H. Lim, D.S. Ginger, K.B. Lee, J.-M. Nam, C.A. Mirkin, "Direct-Write Dip-Pen Nanolithography of Proteins on Charged and Aldehyde Modified SiO<sub>2</sub> Surfaces," *Angew. Chem. Int. Ed.* **2003**, 20, 2411-2414.

US Patent Application, "Peptide and Protein Nanoarrays and Direct-Write Nanolithographic Printing of Peptides and Proteins," filed 3/1/04, #10/788,414, NU 23038, C.A. Mirkin, J.-H. Lim, D.S. Ginger, K.B. Lee, J.-M. Nam, L. Demers.

Using Dip-Pen Nanolithography, methods were developed to pattern nanoscale biomolecules such as proteins, viruses, and DNA onto surfaces. Optical and atomic force microscopy has demonstrated that these "nanoarrays" can bind with their biological complements from solution. These biologically active nanoarrays will not only advance the development of high-density and high-sensitivity nanoscale biosensors (for DNA, protein, and infectious agent detection), but will also act as tools for fundamental studies of biological receptor-ligand interactions.

