Abstract Submitted
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Nanoshaving and Nanografting of Water Soluble Polymers on Glass and Silicon Dioxide Surfaces with Applications to DNA Localization[1] BRIAN DAVIS, HIRAM CONLEY, ROSIE OCHOA, KATIE HURD, MATTHEW R. LINFORD, ROBERT C. DAVIS, Brigham Young University — Chemical surface patterning at the nanoscale is a critical component of chemically directed assembly of nanoscale devices or sensitive biological molecules onto surfaces. Here we present a scanning probe lithography technique that allows for patterning of aqueous polymers on glass or silicon dioxide surfaces. The surfaces were functionalized by covalently bonding a silane monolayer with a known surface charge to either a glass slide or a silicon wafer. A polymer layer less then 2 nm in thickness was electrostatically bound to the silane layer, passivating the functionalized surface. An Atomic Force Microscope (AFM) probe was used to remove a portion of the polymer layer, exposing the functional silane layer underneath. Employing this method we made chemically active submicron regions. These regions were backfilled with a fluorescent polymer and Lambda-DNA. Chemical differentiation was verified through tapping mode AFM and optical fluorescent microscopy. Lines with a pitch as small as 20nm were observed with AFM height and phase mode data.

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