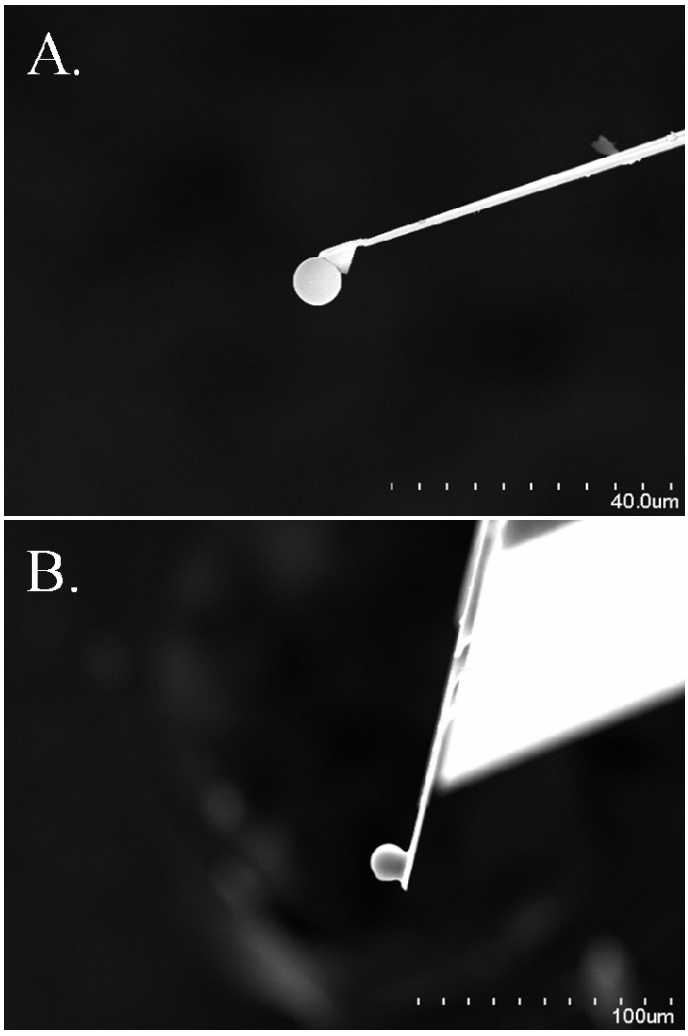
Supplementary information

Note 1.

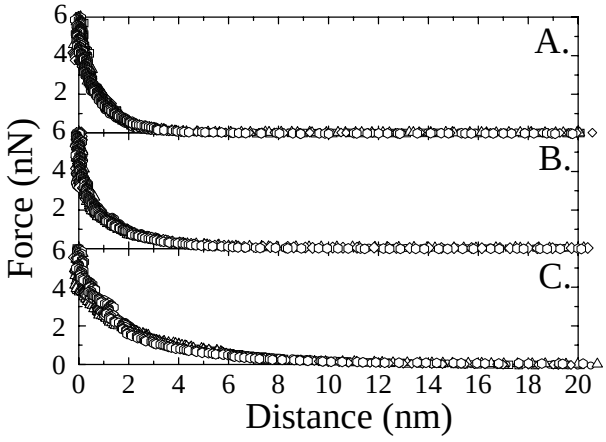
Although one of our applications of these m-PEG films was the DDS, where buffer or saline solutions are predominant, we chose to investigate the surface properties of these m-PEG films mostly in aqueous solutions. This was done because the analysis of an unknown system is normally easier to perform in a simple environment, such as water or an ionic salt aqueous solution, than a buffer solution. Additionally, the facts that the m-PEG chains were uncharged, and the hydrophobic and hydrophilic properties of the PEG chains are reported to make PEGs soluble in water and most organic solvents [4], strongly suggests that the results we obtain here are applicable to the solutions used in DDS applications. Addtionally, the fact that the force curves between a cantilever tip and the m-PEG films were not dependant on the concentration of NaCl also suggested that these results could be used in DDS applications; see Supplementary Figure 2.

Supplementary Figure 1.



SEM image of the colloid probes used in this study. A., an example of a probe used in the normal force studies, where a 6.84μm diameter silica particle was attached to a cantilever probe; B, an example of a probe used in the frictional force studies, where a 15 μm diameter silica particle was attached to a tip-less cantilever probe.

Supplementary Figure 2.



Force between bare cantilever tip and m-PEG modified silica surfaces in various aqueous solutions. Square, Water; circle, 0.1 mM NaCl, triangle, 1 mM NaCl; diamond, 10 mM NaCl; hexagon, 100 mM NaCl. A, PEG6 modified silica surface; B, PEG43 modified silica surface; C, PEG113 modified silica surface.