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Template molecular base pairs: a possible application for molecular devices or more complicated structures, but is such a device realistic? Clearly they must provide a straight template to avoid entanglement, facilitate evaluation, avoid back-coiling, and need high yield of binding: E.g. $\eta_{total} = \eta^N$, if N=100, η=99%, then η_{total} = 0.37. FISH (fluorescence in-situ hybridization), fluorescence dye intercalated in DNA, but is a low yield process. In order to achieve high yield binding, exposes bases (ssDNA) with stretched shape to allow for binding. Electrostatic stretch and positioning of dsDNA. Apply an electric field (1MV/m), DNA moves toward electrode until one end touches and permanently anchors on aluminum electrode. Would like to keep stretched after removing the field. Make electrode gap equal to stretched length of DNA. DNA is immobilized ABOVE the solid surface of the DNA. Images are all fluorescent. Why ssDNA more difficult to stretch? Ds-DNA stiffness due to paired structure and charge backbone, with persistent length (L_p) of 300 bp, ssDNA has hydrophobic folding, internal base pairing and L_p of 10-20 bp, and harder to fluorescence label ssDNA. Stretched length as a function of applied filed, some hysteresis, but about 0.6mm/MV/m for ds DNA, 1mm/MV/m for ssDNA. Successfully stretch ssDNA bridging over the electrode gap, not successful with complimentary stabilization. ssDNA is molecularly weak. Perhaps some protein to keep dsDNA open then open sides can be reacted with. We tried homologous recombination and so we sought complimentary fluorescence labeling. Frequency of binding from homologous site, did not get very specific binding, with slight peak at homologous site but non specifically bound elsewhere. Video shows fluorophore drifting along the DNA. Need to control strength of non-specific binding.