Electrokinetic DNA transport in nanochannels is investigated. Nanochannel dimensions were defined by interferometric lithography and fabricated by spin-coating silica nanoparticles onto photoresist patterns. The pore dimensions are simply adjusted by changing the silica nanoparticle size. We observe DNA transport in 1D porous nanochannel structures, using capillary action (hydrophilic surface tension) and electrophoresis as driving forces. Transport was investigated in both the channel and the porous regions. Fluorescent DNA movement and extension in 1D channels as a function of an applied electric field is observed.

Imaging interferometric microscopy (IIM) allows the acquisition of high-resolution images using a low NA objective combined with multiple sub-images, off-axis illumination, interferometric reconstruction, and digital image processing. The linear systems limit of optics extends to ~λ/4n. Strategies for reaching this limit for thin, absorptive overlayers, such as Si in the visible, with a resolution down to ~30 nm will be discussed.