

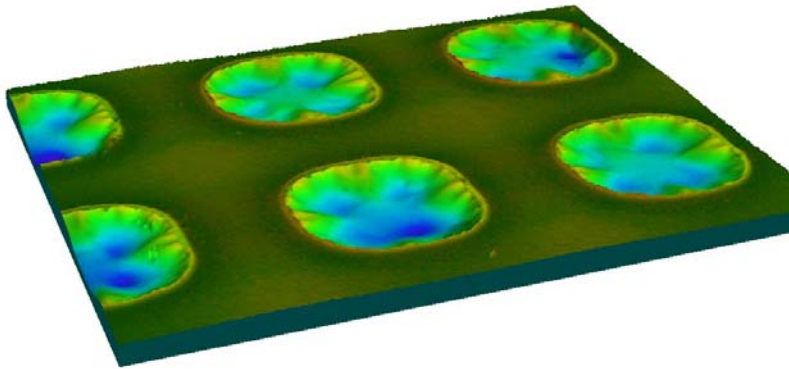
# Nanoporous Membrane for Implantable Drug Delivery

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NNIN Facilities utilized: Nanofabrication Center & Characterization Facility

To develop an interface which protects implanted medical devices from fouling immunoproteins while permitting fast transport of small drugs and analytes into and out of the device, we are integrating a nanoporous block-copolymer film with a microfabricated silicon support, creating a mechanically robust composite membrane with nano-scale size selectivity.



Confocal microscopy image showing the 100 nm thick polymer film spanning an array of 20µm wide pores on a microfabricated silicon support. The polymer was spin-coated onto a thin (40nm) layer of tensile silicon nitride which covered the pores. The nitride was subsequently removed, but the polymer retained its contours. Note that the z-axis is grossly exaggerated.

A change in processing caused crystal deposition at the pore center (shown in lower-left corner of AFM image below). The inset zooms in on an area of high contour relief. Even where the polymer film was distorted by the deposition, the polymer remained intact and retained its nanoporous morphology.

