

ENZYME NANO-LITHOGRAPHY

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We present the use of a proteolytic enzyme to create nanometer-size depressions (wells and channels) in a protein surface. This was achieved by delivering trypsin via a nanopipet, controlled with a scanning probe microscope, to a bovine serum albumin film. In the case of wells formation we suggest a comprehensive model, explaining the processes involved and providing ways to control the parameters governing them. Also, by modulating the lateral movement of the sample at different velocities, we show a clear dependence of the sizes of the channels (widths and depths) with the amount of trypsin deposited. An attempt to demonstrate nano-fluidics in the nano-channels will be presented. Enzyme nanolithography should be useful in areas of nano-biotechnology, such as nanobiochips, nanofluidics, and lab-on-a-chip.