

## Biosensing with Functionalized Single Asymmetric Polymer Nanochannels

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*Macromolecular Bioscience* 10 (2010) 28–32

In this work, we describe the direct covalent attachment of protein recognition elements (biotin) with the carboxyl groups present on the walls of polyimide nanochannels. Subsequently, these biotinylated channels were used for the bio-specific sensing of protein analytes. Moreover, surface charge of these asymmetric nanochannels was reversed from negative to positive via the conversion of carboxyl groups into terminated amino groups. The negatively charge (carboxylated) and positively charged (aminated) channels were further used for the electrochemical sensing of bovine serum albumin (BSA,  $pI=4.7$ ). These biorecognition events were assessed from the changes in the ionic current flowing through the nanochannel.

