

Scanning Probe Lithography for Biosensing and Bioelectronics

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Scanning probe lithography (SPL) comprises a set of techniques (e.g. dip-pen nanolithography (DPN), polymer pen lithography (PPL), microchannel cantilever spotting (μ CS), and many derivatives) that emerged as versatile nanofabrication tools capable of precisely positioning functional materials with nanoscale resolution under ambient and biologically compatible conditions. This talk provides an overview of recent advances in SPL for biosensing and bioelectronics, highlighting its unique ability to bridge nanofabrication and biomolecular functionalization. SPL enables the direct integration of biomolecules, soft materials, and electronic or photonic components into functional hybrid systems. These capabilities open new opportunities for the development of highly sensitive biosensors, multiplexed detection platforms, and bioelectronic interfaces with precisely controlled architecture. The presentation will illustrate how SPL complements established micro- and nanofabrication techniques by offering additive, flexible, and material-efficient patterning strategies and the broader potential of SPL as an enabling technology for next-generation diagnostic devices and bio-integrated electronics.