

Microfabrication and Nanostructure Processing of Advanced Biological Systems

Microelectromechanical systems (MEMS) can be combined with nanostructured materials in the design of multifunctional devices. MEMS provide for the ease of microfluidics control, and allows for the full integration of mechanical and electrical components at the macroscopic level through a top-down approach. In contrast, nanostructured materials enable the bottom-up synthesis and assembly of molecular, supramolecular and nanometer-scale structures with controlled surface functionalization. By bringing together MEMS and nanostructured materials, we can achieve (i) automated preparation and manipulation of biological samples, (ii) high-throughput drug screening, (iii) ultrasensitive biomolecular sensors and medical diagnostics, (iv) complex bioreactors for cell and tissue engineering, and (v) biomimetic artificial organs and implants. This presentation describes the exciting possibilities of engineering advanced biological systems by combining microfabrication of devices and nanostructure processing of materials.

Prof. JACKIE Y.YING

Institute of
Bioengineering and
Nanotechnology