




Conference Proceeding

The Role of Membrane Curvature at the Nano-Bio Interface

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Abstract

The interaction between the cell membrane and the contacting substrate is crucial for many biological applications such as medical implants. We are interested in exploring nanotechnology and novel materials to improve the membrane-surface interactions. Recently, we and other groups show that vertical nanopillars protruding from a flat surface support cell survival and can be used as subcellular sensors to probe biological processes in live cells. Vertical nanopillars deform the plasma membrane inwards and induce membrane curvature when the cell engulfs them, leading to a reduction of the membrane-substrate gap distance. We found that the high membrane curvature induced by vertical nanopillars significantly affects the distribution of curvature-sensitive proteins and stimulates several cellular processes in live cells. Our studies show a strong interplay between biological cells and nano-featured surfaces, which is an essential consideration for future development of interfacing devices.

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