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Biomaterials with nanoscales

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Cells are the smallest living units of human body's structure and function, and their behaviors should not be ignored in human physiological and pathological metabolic activities. Each cell has different scales and also presents distinct responses to specific scales: vascular endothelial cells may obtain a normal function when regulated by the 25 µm strips, but de-functions if the scale is removed; Stem cells can rapidly proliferate on the 30 nm scales nanotubes surface, while stop proliferating when the scale is changed to 100 nm. Therefore, micro and nano scales play crucial role on directing cell behaviors on biomaterials surface. Recent years, we have developed series of biomaterials surfaces with micro and/or nano scales, such as micro-patterns, nanotubes and nanoparticles to control the target cell behavior, further enhance the surface biocompatibility. This contribution will introduce part of our work and review the advances in the micro/nano scales for biomaterials surface functionalization.

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