

综述与专论

医用聚氨酯表面功能化与血液相容性：水分子的作用

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摘要

在生物医用材料血液相容性的影响因素中, 材料表面与水的相互作用极其关键。以医用聚氨酯材料为聚合物模型, 综述了医用聚氨酯表面亲水性功能化的研究进展: 探讨水在抗血液蛋白非特异吸附以及抗血栓功能中所起的作用; 讨论亲水性乙烯类单体、聚乙二醇及其衍生物、肝素及两性离子化合物等改性聚氨酯界面上的水分子行为及其对血液相容性的影响。理解水和水化层在材料和血液接触过程中所起的关键作用, 将为聚合物生物材料的表面设计和应用提供重要的依据。

关键词

[医用聚氨酯](#) [亲水性](#) [表面改性](#) [血液相容性](#)

分类号

Surface functionalization of polyurethane for medicine and blood compatibility: role of H₂O

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Abstract

Interaction of surface with water plays a key role in the blood compatibility of biomedical material. In this article, the research progress in hydrophilic functionalization for the surface of medical polyurethane as the typical model of biomedical polymer was reviewed, and the functions of water to block nonspecific adsorption of blood proteins and the formation of thrombosis were also discussed. The behavior of water molecules and their effect on the blood compatibility of the modified polyurethane, functionalized by the active materials such as hydrophilic vinyl monomer, polyethylene glycol and its derivatives, heparin and zwitterionic materials, was explored. The knowledge of the functionalities of water and hydration layer during the interactions between blood and biomedical materials would benefit surface design and application of biocompatible polymer.

Key words

[medical polyurethane](#) [hydrophilic](#) [surface modification](#) [blood compatibility](#)

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