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论文

聚苯乙烯细胞培养板表面的糖化温敏修饰及其对细胞行为的影响

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摘要:

采用紫外光固定化法, 对组织培养用聚苯乙烯板进行半乳糖糖化温敏修饰. 通过红外光谱(ATR-FTIR)和X射线光电子能谱(XPS)对改性表面的化学组成及结构进行了表征, 并采用原子力显微镜(AFM)观察了改性表面形貌, 发现改性表面比未经修饰表面粗糙度增加. 静态接触角测试结果表明, 改性表面具有良好的温度响应性. 对人肝肿瘤(HepG-2)细胞在改性表面的吸/脱附行为的研究结果表明, HepG-2细胞在半乳糖糖化温敏表面表现出比在未经修饰聚苯乙烯细胞培养板表面更好的生长趋势, 当环境温度降低时, 细胞发生自动脱附, 避免了酶解法对细胞功能造成的损伤.

关键词: N-异丙基丙烯酰胺; 半乳糖; 温度敏感性; 细胞培养; 细胞脱附

Saccharified Thermoresponsive Modification of Polystyrene and Its Effect on Cell Behavior

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Abstract:

Poly(*N*-isopropylacrylamide) and acrylic acid were grafted onto tissue culture polystyrene(TCPS) by UV irradiation, followed by immobilization of the monoamine terminated lactobionic(*L*-NH₂) to acrylic acid carboxyls. The compositions of modified surfaces were characterized by ATR-FTIR and XPS. The morphologies were observed *via* AFM. Results from drop contact angle measurement indicate that the modified surfaces show hydrophobic/hydrophilic property alterations in response to temperature. Adhesion and detachment of hepatic tumor cells(HepG-2) were examined on virgin surface and modified surfaces. Immobilization of *L*-NH₂ facilitated HepG-2 cells adhesion on saccharified thermoresponsive surface. Moreover, HepG-2 cells cultured on modified surfaces can be recovered non-invasively by decreasing temperature.

Keywords: Poly(*N*-isopropylacrylamide); Galactose; Temperature sensitivity; Cell culture; Cell detachment

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