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• 中文摘要

良好生物相容性是植體的首要要求，而植體材的本質及其表面特質決定其生物相容性，尤其是與宿主組織直接接觸的材表面。雖然目前對於植體表面與組織之間的反應、其長期穩定性及在床上的顯著性仍無定，但已知植入後最早的生物反應爲組織液蛋白質在植體表面的吸附，這層緊密吸附的蛋白質直接決定接下宿主對植體表面的細胞反應，所以爲提昇植體與組織間整合，可藉由控制界面反應，吸附特定蛋白質，進而導引有之組織癒合。本研究用低溫電漿活化鈦屬表面以進一步接白蛋白，企圖改變鈦屬表面化學性質，發展一種能鍵結已知生物活性分子到鈦屬表面的技術。首先鈦屬圓片以氬氣電漿去除表面污染物，產生可重複取得的清潔表面，接著用丙烯胺電漿處，使丙烯胺聚合在鈦屬表面，再以交鏈劑戊二醛將白蛋白與丙烯胺的胺基(-NH2) 鍵結。研究顯示使用電漿處技術可使鈦屬表面胺基化，加上交鏈劑戊二醛的處後，可使鈦屬表面接上白蛋白產生表面改質，確可提供一個已知幹細胞分子到鈦屬表面的方式，以期植體植入後能引導及促進組織原。

• 英文摘要

Biocompatibility is the prime requisite for implant material and is determined by the bulk properties and especially the surfaces of implant which directly contacting the host tissue. Even though the relationships and reactions between the surface of implant and tissue and their long-term integrity and clinical efficacy are still not well understood, the first biological reaction known to occur after implantation of a biomaterial is the adsorption of tissue fluid proteins onto its surface and these tightly bound proteins strongly influence the subsequent interactions of cells with the surface. In order to optimize the integration of implants, it is desirable to control interfacial reactions such that nonspecific adsorption of proteins is minimized and beneficial molecules are selectively adsorbed onto

biomaterials prior to their implantation. In this regard, our goal was to develop a glow-discharge method to functionalize titanium surfaces by the covalent immobilization of bioactive organic molecules. Based on the above investigation, the surface characteristics was successful modified on the titanium plates by glow discharge technology and this method could offer the possibility of covalently linking stem cell on titanium surface in order to guide and promote the tissue healing that occurs during implant integration in bone and soft tissue.