عنوان مقاله:

Plasma Influence of Surface Texture of Silicone Rubber for Biomedical Application in Scala Tympani

محل انتشار:

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خلاصه مقاله:

This study aims to fabricate an optimum interface surface for intracochlear catheter applications. The samples were first fabricated of two-component liquid dimethyl siloxane by designing and fabricating a mold, and then the assembly underwent surface treatment using a plasma irradiation device. The water contact angle test results showed an increase in the surface hydrophilicity of this material that water drop contact angle of origin silicone is ۱۰۵° that after treatment decrease to ۶۰°, which has the property of reducing the effect of cellular cutting in the inner ear when passing through the scala tympani. The surface engagement during passage was also minimized with an increase in surface roughness at the nanoscale. SEM and AFM photomicrographs and nano graphs show that the morphology of catheter surface in nanoscale changed and roughness increased, which is desirable for this purpose. The cell viability test results showed an improved adhesion and cell growth on the modified surface and origin silicone, and ۹۵ % viability of cells confirmed, indicating the optimal biocompatibility of the modified silicone sample. This catheter can be used in cochlear implantation and drug delivery before surgery to enhance therapeutic efficiency

کلمات کلیدی:

Polydimethylsiloxane (PDMS), Plasma, Catheter, Scala Tympani, Neurotrophin