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Influence of various sterilization procedures on TiO₂ nanotubes used for biomedical devices

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Abstract

Sterilization is the final surface treatment procedure of all implantable devices and is one of the key factors which have to be considered before implementation. Since different sterilization procedures for all implantable devices influence mechanical properties as well as biological response, the influence of different sterilization techniques on titanium nanotubes was studied. Commonly used sterilization techniques such as autoclaving, ultra-violet light sterilization, hydrogen peroxide plasma sterilization as well as the not so frequently used gaseous oxygen plasma sterilization were used. Three different nanotube diameters; 15 nm, 50 nm and 100 nm were employed to study the effects of various sterilization techniques. It was observed that autoclave sterilization resulted in destruction of nanotubular features on all three studied nanotube diameters, while UV-light and both kinds of plasma sterilization did

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