Nanostructuured titanium-based materials for medical implants: Modeling and development - DTU Orbit (04/08/2019)

Nanostructured titanium-based materials for medical implants: Modeling and development

Nanostructuring of titanium-based implantable devices can provide them with superior mechanical properties and enhanced biocompatibility. An overview of advanced fabrication technologies of nanostructured, high strength, biocompatible Ti and shape memory Ni-Ti alloy for medical implants is given. Computational methods of nanostructure properties simulation and various approaches to the computational, "virtual" testing and numerical optimization of these materials are discussed. Applications of atomistic methods, continuum micromechanics and crystal plasticity as well as analytical models to the analysis of the reserves of the improvement of materials for medical implants are demonstrated. Examples of successful development of a nanomaterial-based medical implants are presented. (C) 2014 Elsevier B.V. All rights reserved.

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