SUCCESS STORIES

MNT-IS: Multifunctional nanostructured titanium implant surfaces and biochemical considerations of animal models used in tissue engineering of bone

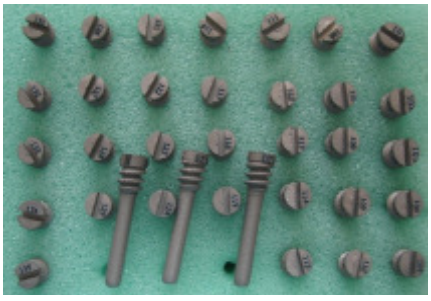
PROJECT DESCRIPTION

The scientific and technological specific objectives of the project are:

- to advent new osteoinductive biomaterials for tissue regeneration
- to elucidate the nanostructural nature of osteoinduction using in vitro/in vivo tests
- to develop better biomechanical nanostructural testing systems
- to design and realize a suitable implant type and find the right animal model for the osteoinductive biomaterials

Project results at this stage:

- Obtaining the metallic biomaterials (R&D CONSULTANTA SI SERVICII SRL and SC ZIROM SA)
- Design and realization of new special knee implant (Instituto Tecnologico Canario)
- Selection of the suitable animal model (Hospital Universitario de Canarias and Hospital Clínico Veterinario)
- Biocompatible surface finish was realized by:
    1) deposition from solutions similar with sanguine plasma SBF (POLITEHNICA University of Bucharest)
    2) by chemical treatment was obtained a sodium titanate coating (Universidad de Las Palmas de Gran Canaria);
- Preclinical experiments (Hospital Universitario de Canarias and Hospital Clínico Veterinario).
- Micro/nanostructural/eletrochemical and biomechanical testing were also performed (Universidad de Las Palmas de Gran Canaria; POLITEHNICA University of Bucharest; Physical Chemistry Institute “Ilie Murgulescu”; Technical University “Gh. Asachi”).



Further results:

Studies will be completed with preclinical and clinical evaluation of engineered tissue bones models. The doctors involved in project will establish the indications and limits of them. Clinic evaluation tests such as score IKDC; NOYES; TEGNER, LYSHOLM and also imagistical, histological and biochemical methods will be carried out.

Dissemination till this stage:

- D. Ionita, D. Raducanu, M. Prodana, I. Demetrescu, *The manipulation of properties of Ti bioalloys at micro and nanoscale using etching procedures*, Key Engineering Materials (ISI) Vols. 396-398 (2009), 393-396, Trans Tech Publications, Switzerland

- E. Vasilescu, D. Raducanu, P. Drob, V.D. Cojocaru, C. Vasilescu, *Influenta stabilizatorilor β asupra rezistentei la coroziune a unui aliaj biocompatibil de titan*, Revista de Chimie (ISI), Vol. 58 (12) 2007, 1244-1248, ISSN 0034-7752

- M.V. Popa, P. Drob, D. Raducanu, J.R. Castro, J.C. Mirza Rosca, *Evaluarea microstructurii şi a comportării la coroziune a unui aliaj de titan în fluide biologice simulate*, Revista de Chimie (ISI), Vol. 58 (2) 2007, 179-182, ISSN 0034-7752.

Workshops organized by project consortium:

- *4th Workshop on MNT–IS*, Nov. 2008, Las Palmas de Gran Canaria, Spain
- *New top experimental techniques of obtaining and characterization of materials*, Mart. 2008, Las Palmas de Gran Canaria, Spain
- *Biomaterials Design and Applications*, Apr. 2007, Predeal, Romania.

SUCCESS STORIES

PARTNERS:

Project coordinator: Universidad de Las Palmas de Gran Canaria, **Spain**

Project partners:
Hospital universitario de Canarias, **Spain**
Hospital Clínico Veterinario, **Spain**
Instituto Tecnológico Canario, **Spain**
POLITECHNICA University of Bucharest, **Rumania**
Technical University "Gh. Asachi", **Rumania**
R&D CONSULTANTA SI SERVICII SRL, **Rumania**
SC ZIROM SA, **Rumania**

PROJECT DURATION AND TOTAL PROJECT COST:

Duration: 01/11/2006 – 30/10/2009
Cost: 370.300 Euro

CONTACT:

Coordinator: Agustin Santana López
e-mail : jmirza@dim.ulpgc.es
Tel : +34 616876482