



Discipline Information

The following dates are in (dd/mm/yyyy) format.

Code: RAL5877 - 2 Type: POS
Name: Health Sciences Applied to Locomotor System
Concentration area: Ciências da Saúde Aplicadas ao Aparelho Locomotor (17142)

Approval dates:

CCP: 04/08/2017 CPG: 12/09/2017 CoPGr: 11/10/2017

Activation date: 11/10/2017 Inactivation date:

Workload:

Total: 45 h Theory: 4 h Practice: 5 h Study: 6 h

Credits: 3 Duration: 3 weeks

Professors: 868885 - Flávio Luís Garcia - 11/10/2017 until today

Objectives:

Provide knowledge about models and methods of evaluation of osseointegration of orthopedic implants.
Encourage the development of research lines on related topics.
To enable postgraduate students to develop projects in this line of research and to discuss in a critical way the scientific research articles relevant to the topic.

Rationale:

Currently, all regions of the human skeleton can be surgically managed and represent sites where, at least potentially, there may be indication of use of an orthopedic implant.
In this discipline we will analyze the interrelation between bone and orthopedic implants, with emphasis on arthroplasties. In order to understand the variability of the bone reactions around orthopedic implants, it is necessary to understand the different mechanical properties of these, the characteristics of their surface, as well as the general principles of bone remodeling. Within this context, we will also address the factors that promote and those that compromise osseointegration of implants.

Content:

The course will be taught through theoretical lectures and seminars on osseointegration of metallic implants, the biological and physical mechanisms that regulate it, and methods of evaluation of this process.

Bibliography:

Biological fixation of endosseous implants. Franchi M, Fini M, Martini D, Orsini E, Leonardi L, Ruggeri A, Giavaresi G, Ottani V. *Micron*. 2005;36(7-8):665-71

Fabrication methods of porous metals for use in orthopaedic applications. Ryan G, Pandit A, Apatsidis DP. *Biomaterials*. 2006;27(13):2651-70

Biomaterial osseointegration enhancement with biophysical stimulation. Dimitriou R, Babis GC. *J Musculoskelet Neuronal Interact*. 2007;7(3):253-65.



Discipline Information

Biology of implant osseointegration. Mavrogenis AF, Dimitriou R, Parvizi J, Babis GC. *J Musculoskelet Neuronal Interact.* 2009;9(2):61-71

Osteointegration of orthopaedic devices. Ochsner PE. *Semin Immunopathol.* 2011;33(3):245-56

Pharmacologic augmentation of implant fixation in osteopenic bone. Ross RD, Hamilton JL, Wilson BM, Sumner DR, Viridi AS. *Curr Osteoporos Rep.* 2014;12(1):55-64

Titanium nanostructures for biomedical applications. Kulkarni M, Mazare A, Gongadze E, Perutkova Š, Kralj-Iglić V, Milošev I, Schmuki P, A Iglič M, Mozetič M. *Nanotechnology.* 2015;26(6):062002. doi: 10.1088/0957-4484/26/6/062002

Cellular responses evoked by different surface characteristics of intraosseous titanium implants. Feller L, Jadwat Y, Khammissa RA, Meyerov R, Schechter I, Lemmer J. *Biomed Res Int.* 2015;2015:171945. doi: 10.1155/2015/171945

Effect of osteoporosis on fixation of osseointegrated implants in rats. Li Y, He S, Hua Y, Hu J. *J Biomed Mater Res B Appl Biomater.* 2016. doi: 10.1002/jbm.b.33787

Surface modification of titanium alloys for biomedical application: from macro to nano scale. Pedreira De Oliveira D, Ottria L, Gargari M, Candotto V, Silvestre FJ, Lauritano D. *J Biol Regul Homeost Agents.* 2017;31(2 Suppl 1):221-232

Systemic drugs that influence titanium implant osseointegration. Apostu D, Lucaciu O, Lucaciu GD, Crisan B, Crisan L, Baciut M, Onisor F, Baciut G, Câmpian RS, Bran S. *Drug Metab Rev.* 2017;49(1):92-104

Type of Assessment:

Seminar presentation or preparation of monograph.

Note:

The course may be presented in English or Portuguese.

Gerado em 10/03/2021 10:46:17