Janus Sistema Administrativo da Pós-Graduação

Discipline Information

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

Code: RAL5877 - 4 Type: POS
Name: Health Sciences Applied to Locomotor System
Concentration area: Ciências da Saúde Aplicadas ao Aparelho Locomotor (17142)

Approval dates:
CCP: 24/11/2022 CPG: 25/11/2022 CoPGr:

Activation date: 25/11/2022 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 - 25/11/2022 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:

Osteointegration of orthopaedic devices. Ochsner PE. Semin Immunopathol. 2011 May;33(3):245-56
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
Current methods of preventing aseptic loosening and improving osseointegration of titanium implants in cementless total hip arthroplasty: a review. Apostu D, Lucaciu O, Berce C, Lucaciu D, Cosma D. J Int Med Res. 2018 Jun;46(6):2104-2119
Nano-scale modification of titanium implant surfaces to enhance osseointegration. Souza JCM, Sordi MB, Kanazawa M, Ravindran S, Henriques B, Silva FS, Aparicio C, Cooper LF.

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Acta Biomater. 2019 Aug;94:112-131
Role of implants surface modification in osseointegration: A systematic review. Liu Y, Rath B, Tingart M, Eschweiler J. J Biomed Mater Res A. 2020 Mar;108(3):470-484
Orthopaedic osseointegration: Implantology and future directions. Overmann AL, Aparicio C, Richards JT, Mutreja I, Fischer NG, Wade SM, Potter BK, Davis TA, Bechtold JE, Forsberg JA, Dey D. J Orthop Res. 2020 Jul;38(7):1445-1454
Electrical stimulation to promote osseointegration of bone anchoring implants: a topical review. Pettersen E, Anderson J, Ortiz-Catalan M. J Neuroeng Rehabil. 2022 Mar 21;19(1):31
Evolution of implants and advancements for osseointegration: A narrative review. Walter N, Stich T, Docheva D, Alt V, Rupp M. Injury. 2022 Nov;53 Suppl 3:S69-S73

Type of Assessment:

Seminar presentation or preparation of monograph.

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