

## **ALO 802 BIOMATERIALS AND INTERACTION WITH MUSCLE-SKELETAL TISSUE**

**Workload:** 30 hours

**Credits:** 02

**Nature:** Optional Master and PhD

**Discipline syllabus:** The objective is to provide students with basic and advanced knowledge of the use of biomaterials such as medical implants, tissue reaction and biocompatibility of different implants to musculoskeletal tissues. It will be held at the Faculty of Medicine of UFMG in weekly classes of 03 hours through theoretical exposition, seminars, discussion groups and literature review. The teaching resources include datashow, virtual libraries, internet, websites, teleconferences, videos, laboratories. Students evaluation it will be done by written exam at the end of the internship plus attendance, participation in activities and integration with colleagues and teacher.

Content:

- 1- Bone Pathophysiology
- 2- History of the use of implants in orthopedics
- 3- Biocompatibility of metal implants
- 4- Biocompatibility of polymers
- 5- Infection associated with implants
- 6- Mechanisms of bacterial adhesion to biomaterials
- 7- Periprosthetic osteolysis
- 8- Properties of bone grafts
- 9- Heterologous grafts
- 10- Bioceramics

Bibliographic references:

Teixeira, LEM.; Soares, GG; Teixeira, HC ; Takenaka, IKTM. ; Diniz, SOF. ; Andrade, MAP; Cardoso, VN.; Araujo, ID. Efficacy of <sup>99m</sup>Tc- labelled ceftizoxime in the diagnosis of subclinical infections associated with titanium implants in rats. *Surgical Infections*, v. 16, p. 352-357, 2015.

Katsokogianni M, Missirlis IF. Concise review of mechanisms of bacterial adhesion to biomaterials and to techniques used in estimating bacteria–material interaction. *Eur Cell Mater* 2004;**8**:37–57.

Athanasou NA. The pathobiology and pathology of aseptic implant failure. *Bone Joint Res.* 2016 May;**5**(5):162-8.

Rakow A, Schoon J, Dienelt A, John T, Textor M, Duda G, et al. Influence of particulate and dissociated metal-on-metal hip endoprosthesis wear on mesenchymal stromal cells in vivo and in vitro. *Biomaterials.* 2016 Apr **26**;98:31-40.

Guda T, Appleford M, Oh S, Ong JL. *Curr Top Med Chem.* 2008;8(4):290-9. A cellular perspective to bioceramic scaffolds for bone tissue engineering: the state of the art.

Nandi SK, Roy S, Mukherjee P, Kundu B, De DK, Basu D. Orthopaedic applications of bone graft & graft substitutes: a review. *Indian J Med Res.* 2010 Jul;132:15-30.

Simion M, Fontana F. Autogenous and xenogeneic bone grafts for the bone regeneration. A literature review. *Minerva Stomatol.* 2004 May;53(5):191-206.