Academic year 2021./2022.

Course title

Growth factors in periodontal and bone regeneration

Department

Department of Periodontology

Adress

Gundulićeva 5

Total ECTS points

2

Course leader

Associate prof. Darko Božić

Course associates

Prof. Lovorka Grgurević

Igor Erjavec, PhD

Teaching plan

	No. classes
Lecture	3
Seminar	3
Practical	4
Total	10

1 class = 45 minutes

Course description

Over the last several decades Growth factors have entered the clinical practice. In dentistry, some growth factors have been applied clinically for more than two decades. Despite numerous promising results in preclinical studies, the impression remains that in the clinical practice, growth factors are not as effective in periodontal and bone regeneration. In this course, the mechanisms of action of various growth factors on periodontal and bone cells will be described and their application in periodontal and bone regeneration will be explained in detail. Participants will be introduced to the latest data on long-term results when applying these agents in periodontal and bone regeneration based on the results of clinical studies and meta-analyzes and systematic review articles. They will also be introduced to the method of diagnosing clinical outcomes using microCT imaging analysis of histological samples.

Learning outcomes

1. Attendees will identify which growth factrors are utilized in bone and periodontal regeneration.
2. Attendeed will recognize and discuss on the different mechanisms through which growth factors exert their activity.

3. A comparison on the efficacy of different growth factors in periodontal and bone regeneration will be done.
4. It will be concluded what is the effect of applying growth factors on the clinical outcomes.

Course contet

Lecture

	Lecture topics	**Number of classes/hours**
1.	Growth factors in bone regeneration	1
2.	Growth factors in periodontal regeneration	1
3.	Use of bone morphogenetic proteins in the clinical practice	1
4.	-	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Seminari

	Seminar topics	**Number of classes/hours**
1.	How successful is regenerative periodontal surgery?	1
2.	What is the influence of growth factors use on bone regeneration?	1
3.	Are stem cell successful in periodontal regeneration?	1
4.	-	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Vježbe

	practicals topics	**Number of classes/hours**

1.	MicroCT in preclinical animal research	4
2.	-	-
3.	-	-
4.	-	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 class = 45 minutes

Literature

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Božić D, Ćatović I, Badovinac A, Musić L, Par M, Sculean A. Treatment of Intrabony Defects with a Combination of Hyaluronic Acid and Deproteinized Porcine Bone Mineral. Materials (Basel). 2021 Nov 11;14(22):6795. doi: 10.3390/ma14226795. PMID: 34832196; PMCID: PMC8624958.

Sanz M, Dahlin C, Apatzidou D, Artzi Z, Bozic D, Calciolari E, De Bruyn H, Dommisch H, Donos N, Eickholz P, Ellingsen JE, Haugen HJ, Herrera D, Lambert F, Layrolle P, Montero E, Mustafa K, Omar O, Schliephake H. Biomaterials and regenerative technologies used in bone regeneration in the craniomaxillofacial region: Consensus report of group 2 of the 15th European Workshop on Periodontology on Bone Regeneration. J Clin Periodontol. 2019 Jun;46 Suppl 21:82-91. doi: 10.1111/jcpe.13123. PMID: 31215114.

Tavelli L, McGuire MK, Zucchelli G, Rasperini G, Feinberg SE, Wang HL, Giannobile WV. Biologics-based regenerative technologies for periodontal soft tissue engineering. J Periodontol. 2020 Feb;91(2):147-154. doi: 10.1002/JPER.19-0352. Epub 2019 Oct 8. PMID: 31479158.

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and the future. J Clin Periodontol. 2016 Aug;43(8):668-83. doi: 10.1111/jcpe.12546. Epub 2016 May 28. PMID: 26987551.

Bozic, D.; Grgurevic, L.; Erjavec, I.; Brkljacic, J.; Orlic, I.; Razdorov, G.; Grgurevic, I.; Vukicevic, S.; Plancak, D. The Proteome and Gene Expression Profile of Cementoblastic Cells Treated by Bone Morphogenetic Protein-7 in Vitro. J. Clin. Periodontol. **2012**, 39, 80–90.

Han J, Menicanin D, Gronthos S, Bartold PM. Stem cells, tissue engineering and periodontal regeneration. Aust Dent J. 2014 Jun;59 Suppl 1:117-30. doi: 10.1111/adj.12100. Epub 2013 Sep 23. PMID: 24111843.

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CV (*curriculum vitae*) and

He is an associate professor at the Faculty of Dentistry, University of Zagreb, Department of Periodontology and is also employed at the Clinic of Dentistry, University Hospital Center Zagreb.
Darko Božić was born on April 25, 1973 in Zagreb. He graduated from the Faculty of Dentistry in 2000. Since December 2001, he has been employed at the Department of Periodontology of the Faculty of Dentistry. He received his Masters of science degree on 16 June 2005 with the topic "Prevalence of periodontal diseases and caries in the city of Zagreb after 16 years (1986-2002). In 2005 he passed the specialist exam in periodontology.
He received his PhD on 21 June 2010 with a dissertation entitled “The influence of recombinant human bone morphogenetic protein-7 (rhBMP-7) on gene expression in cementoblasts”.
As a mentor and co-author, he won two prestigious international research awards in 2014, first place at the Robert Frank International IADR Science Award, and second prize at the 2015 IADR Hatton Competition. Both awards were won in the senior clinical research category for research entitled “Proteomic analyzes of gingival tissue in patients with aggressive periodontitis”.
He is the winner of the award of the Croatian Medical Association.
He is the leader of the course "Therapy of patients with advanced periodontitis" at the postgraduate specialist study of dental medicine. He is the head of the courses Periodontology 1 and 2 at the postgraduate specialist study in Dental Implantology.
He actively participates in postgraduate classes at the Faculty of Dentistry and Medicine, University of Zagreb. At the postgraduate doctoral study of Dental Medicine he is the head of the course: Regenerative periodontal therapy and tissue engineering, while as a co-leader he participates in the postgraduate doctoral study of the Faculty of Medicine in the subject "Proteomics in biomedical research". subject "Molecular Biology of Mineralized Tissues".

He is the Croatian coordinator of a multicenter clinical study utilizing EMD in non-surgical therapy, and conducts randomized clinical trials in the treatment of periodontitis and tissue reconstruction. His research focuses on the application of growth factors and collagen matrices in the reconstruction of hard and soft tissues in patients with periodontitis. Due to his research, he is a frequent guest lecturer at international congresses.
He is an active lecturer and leader of continuing education courses in the field of periodontology and implantology, and has so far given over 70 lectures at domestic and major international congresses such as the PerioMasterClinic and Europerio, where he has been invited three times.
He has participated in the XV workshop of the European Federation of Periodontology, which dealt with the topic of bone regeneration "15th European Workshop on Periodontology on Bone Regeneration", and also participated in the XVI workshop of the European Federation of Periodontology, which dealt with guidelines for periodontal therapy ˝Treatment of stage I-III periodontitis-The EFP S3 level clinical practice guideline˝. He has also been invited to the XVIII European Workshop of Periodontology on the topic: "EVIDENCE-BASED GUIDELINE FOR PERI-IMPLANT THERAPY".
He is the president of the Croatian Periodontology Society, and in 2020 he was elected a member of the executive board of the European Federation of Periodontology, and in the period from 2023 to 2024 he will be the president of the EFP.
He is a member of the IADR and the Croatian Medical Association.

Bibliography of course leader

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