Academic year 2021./2022.

Course title: Immunohistochemical and molecular analysis of the pulp and periapical inflammation

Department: Department of endodontics and restorative dentistry

Adress Gundulićeva 5, Zagreb

Total ECTS points: 3

Course leader: Silvana Jukić Krmek

Course associates: Mirza Žižak

Teaching plan

	No. classes
Lecture	6
Seminar	3
Practical	6
Total	15

1 class = 45 minutes

Course description

In the theoretical part, participants will be informed about the inflammatory response in pulp and periapical tissue. modification of the inflammatory response, nonspecific and specific mediators of the inflammatory process, activation of T and B lymphocytes, expression of membrane and intracellular receptors associated with inflammation and cell apoptosis. Immunohistochemical determination of hormone receptor and tumor suppressor protein expression and the use of polymerase chain reaction (PCR and RT PCR) in qualitative and quantitative gene studies will be studied. In the practical part, participants will be introduced to the laboratory method of immunohistochemical methods: sampling and storage, monoclonal and polyclonal antibodies. visualization procedures, qualitative and semiquantitative reading of results and their interpretation. Protein expression will be shown by the Western Blot method. The sequence of genomic analysis procedures and the principle of operation of PCR and RT PCR devices will be explained. Participants will perform a DNA and mRNA isolation procedure under the supervision of a teacher. reverse mRNA transcriptase, DNA replication in a PCR device, and the Elisa gene replication assay.

Learning outcomes

1. Describe the role of inflammatory modulators in the pulp and periapical
2. Apply histochemical and PCR methods of analysis in the study of pathological events in the pulp and periapical tissues
3. Plan research related to the detection of potential modulators of inflammation in the specified tissue

Course contet

Lecture

	Lecture topics	Number of classes/hours
1.	-Dental pulp as part of the pulpal-dentinal complex	-
2.	-Circulation of dental pulp	-
3.	-Inflammatory processes in the dental pulp	-
4.	-Inflammatory processes in periapical tissue	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Seminari

	Seminar topics	Number of classes/hours
1.	- Pulp as a source of stem cells for the regeneration of other tissues	-
2.	- Models of dental pulp inflammation testing	-
3.	- Inflammatory diseases of the dental pulp - a new classification	-
4.	- Pulp as a source of stem cells for the regeneration of other tissues	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Vježbe

	practicals topics	Number of classes/hours
1.	-Histokemijske metode	-
2.	-PCR	-
3.	-	-
4.	-	-

5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 class = 45 minutes

Literature

Hargreaves KM. Goodis HE. Seltzer and Benders Dental Pulp. Quintenssence publishingChicago. 2nd ed. 2012.

Domenico Ricucci and José F. Siqueira Jr. Endodontology: An. Integrated Biological and Clinical ViewChicago: Quintessence Publishing. 2015.

Richert, R., Ducret, M., Alliot-Licht, B., Bekhouche, M., Gobert, S. and Farges, J.-C. (2022), A critical analysis of research methods and experimental models to study pulpitis. Int Endod J. Accepted Author Manuscript. https://doi.org/10.1111/iej.13683

Kim SG, Malek M, Sigurdsson A, Lin LM, Kahler B. Regenerative endodontics: a comprehensive review. Int Endod J. 2018 Dec;51(12):1367-1388.

Tatullo M, Marrelli M, Shakesheff KM, White LJ. Dental pulp stem cells: function, isolation and applications in regenerative medicine. J Tissue Eng Regen Med. 2015 Nov;9(11):1205-16.

Chen CA, Chen YL, Huang JS, Huang GT, Chuang SF. Effects of Restorative Materials on Dental Pulp Stem Cell Properties. J Endod. 2019 Apr;45(4):420-426.

Martens W, Wolfs E, Struys T, Politis C, Bronckaers A, Lambrichts I. Expression pattern of basal markers in human dental pulp stem cells and tissue. Cells Tissues Organs. 2012;196(6):490-500.

Wolters, W.J., Duncan, H.F., Tomson, P.L., Karim, I.E., McKenna, G., Dorri, M., Stangvaltaite, L. and van der Sluis, L.W.M. (2017), Minimally invasive endodontics: a new diagnostic system for assessing pulpitis and subsequent treatment needs. Int Endod J, 50: 825-829.

CV (*curriculum vitae*) and bibliography of course leader – link to CROSBI profile

Prof.dr.sc. Silvana Krmek was born on October 19, 1968 in Split. She enrolled at the Faculty of Dentistry, University of Zagreb in 1988 and graduated in 1994.

In September 1997 she obtained a master's degree in "The effect of CO2 and ND: YAG laser on the pulp and periodontal tissue of the dog", and in 2001 he defended his doctoral dissertation entitled "Estrogen receptors in human pulp".

She is the leader of a scientific research project of the Ministry of Science, Education and Sports of the Republic of Croatia entitled: "Epidemiological aspects of endodontics in the Republic of Croatia" from 2006 to 2011.

She has published a total of 84 "in extenso" scientific papers (55 in WoS, 14 in Scopus, and 16 scientific papers are classified in the category of other papers) and 16 professional papers. Papers have been cited 485 times according to SCI / WoS, and the -h-index is 15. 26 abstracts of congress papers have been published in Current Contents and she has published 21 more non-indexed abstracts and her papers have been cited 125 times.

He is a full professor and teaches Cariology, Restorative Dentistry and Endodontics. She is the leader of the course "Preclinical Endodontics", and in the doctoral study he teaches the course "Immunohistochemical and molecular analysis of pulp and periapical diseases". At the postgraduate specialist study of Dental Medicine, she is the lecturer of the course "Immune approach to pulp-periapical diseases".

She is the editor and co-author of the university textbook Preclinical Endodontics and the co-author of the translation of two university textbooks into Croatian. Se is the co-editor of the Croatian edition of the Handbook of Endodontics for Practitioners.

From 2004 to 2006 she was the secretary of the Croatian Endodontic Society. She is currently the Vice Dean for Science at the Faculty of Dentistry and the Head of the Department of Endodontics and Restorative Dentistry.

Areas of scientific interest include epidemiological research in cariesology and endodontics, inflammatory and immunological events in dental pulp and periapex, biological impact and mechanical properties of root canal filling materials and testing of physical properties of materials in restorative dentistry.

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