Academic year 2021./2022.

Course Title

MOLECULAR BIOMARKERS AND "OMICS" TECHNOLOGIES IN ORAL DISEASES DIAGNOSTICS

Department

Department of Oral Surgery

Address

Gundulićeva 5

Total ECTS points

3

Course leader

Assistant Professor Ivan Salarić, PhD

Course associates

Assistant Professor Ivana Karmelić, PhD

Marko Rožman, PhD

Teaching plan

	No. classes
Lecture	5
Seminar	2
Practical	8
Total	15

1 class = 45 minutes

Course description

The aim of the course is to acquaint students with OMICS technologies, molecular diagnostics and biomarkers used in scientific research and clinical practice in oral diseases diagnosis.

Special attention will be paid to the possibilities of salivary diagnostics, salivary and serum biomarker research and microbiome analysis of peri-implant and periodontal disease.

Students will be introduced to the principles of OMICS technologies, applications of molecular medicine methods in the diagnosis of oral diseases, pathohistological diagnostics, immunohistochemical diagnostics, Enzyme-linked immunosorbent assay (ELISA), types of chromatography with special emphasis on high performance liquid chromatography (HPLC) and pharmacogenomics and proteomics in the detection of oral diseases.

Learning outcomes

1. Recognize basic concepts of OMICS technologies
2. To explain the advantages and disadvantages of salivary and serum diagnostics of oral diseases

3. To apply methods of molecular diagnostics in clincal and basic research
4. To distinguish sampling and processing methods of saliva samples

Course content

Lecture

	Lecture topics	Number of classes/hours
1.	Biomarkers in oral diseases diagnostics	1
2.	New technologies in saliva anaylsis	1
3.	ELISA in oral diseases diagnostics	1
4.	Chromatography in oral diseases diagnostics	1
5.	'Omics' Sciences: Genomics, proteomics, metabolomics and pharmacogenomics in oral diseases	1
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 class = 45 minutes

Seminari

	Seminar topics	Number of classes/hours
1.	Body fluids – diagnostic potential	1
2.	Critical analysis of a scientific paper from the literature	1
3.	-	-
4.	-	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 class = 45 minutes

Vježbe

	practicals topics	Number of classes/hours

1.	Saliva sampling and processing in the lab	1
2.	Literature review – OMICS technologies (journal club)	1
3.	ELISA analysis with serum and saliva samples	1
4.	Principle of HPLC	1
5.	HPLC and mass spectrometry in salivary diagnostics	1
6.	Biomarkers in potentially malignant oral disorders and oral cancer diagnosis	1
7.	Biomarkers in peri-implantitis and periodontitis	1
8.	Genomics in carcinogenesis	1
9.	-	-
10.	-	-

1 class = 45 minutes

Literature

1.Marinka Mravak Stipetić, Jadranka Sertić, Anka Jurišić Kvesić i suradnici (2018). Opće zdravlje kroz oralno zdravlje, multidisciplinarni pristup. Hrvatska komora dentalne medicine, Zagreb. ISBN: 978-953-95183-7-8.

2. Juluri R. Rao, Colin Craig Fleming, John Edmund Moore (2006). Molecular Diagnostics. Horizon Bioscience. ISBN: 190493319X, 9781904933199

3. Charles F. Streckfus (2015). Advances in Salivary Diagnostics. Springer. ISBN: 978-3-662-45398-8

4. Brad W. Neville, Angela C. Chi, Douglas D. Damm, Carl M. Allen (2015). Oral and Maxillofacial Pathology, Elsevier Health Sciences. ISBN: 9781455770526

5. Dongfeng Tan, Henry T. Lynch (2012). Principles of Molecular Diagnostics and Personalized Cancer Medicine, Lippincott Williams & Wilkins. ISBN: 9781451131970

CV (*curriculum vitae*) and bibliography of course leader

Ivan Salarić was born on January 14th 1988 in Zagreb. He graduated from the Classical Gymnasium, Križanićeva 4a, in Zagreb in 2006. He graduates from the University of Zagreb School of Dental Medicine in 2012. He finished Harvard School of Public Health; Harvardx program: PH207x Health in Numbers: “Quantitative Methods in Clinical & Public Health Research ”in January 2013 and the Massachusetts Institute of Technology; MITx program: 7.00x "Introduction to Biology: The Secret of Life" in December 2013. He defended his doctoral dissertation entitled " Salivary melatonin concentration assessment in patients with oral squamous cell carcinoma” in 2019.

In 2018 he takes a specialist exam and becomes an oral surgery specialist. Currently he is employed as an Assistant Professor at the Department of Oral Surgery, University of Zagreb School of Dental Medicine and as a oral surgeon at the Department of Oral and Maxillofacial Surgery, University Hospital Dubrava. He continuously attends and participates at national and international congresses.

He was awarded with the National Cancer Research Institute Company of Biologists Award in 2018, Robert Frank Award (International Association of Dental Research) in 2014 and Rector's Award in 2012. He was a City of Zagreb scholarship holder in 2011, University of Zagreb scholarship holder in 2010 and Ministry of Science and Education scholarship holder in 2009. He is a member of the Croatian Society for Dental Implantology and Croatian Society for Oral Surgery of the Croatian Medical Association. He is a member of the Croatian Ministry of Health task force for conducting activities for early diagnosis of oral cancer.

Published literature:

https://scholar.google.com/citations?user=_edo0scaaaaj&hl=en