

# IMMUNOHISTOCHEMISTRY TECHNIQUES

1	Course Title:	IMMUNOHISTOCHEMISTRY TECHNIQUES	
2	Course Code:	THE6004	
3	Type of Course:	Compulsory	
4	Level of Course:	Third Cycle	
5	Year of Study:	1	
6	Semester:	2	
7	ECTS Credits Allocated:	3.00	
8	Theoretical (hour/week):	1.00	
9	Practice (hour/week):	2.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	NONE	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. ZEHRA MİNİBAY	
15	Course Lecturers:	Prof. Dr. Zehra MİNİBAY Prof. Dr. Özhan EYİĞÖR	
16	Contact information of the Course Coordinator:	zminbay@uludag.edu.tr (224) 295 40 64 Bursa Uludağ Üniversitesi Tıp Fakültesi Histoloji ve Embriyoloji AD 16059 Nilüfer Bursa	
17	Website:		
18	Objective of the Course:	To educate researchers; who comprehend the detailed knowledge of and immunohistochemical techniques, who acknowledge the area of usage and the differences of these techniques and who can employ these techniques.	
19	Contribution of the Course to Professional Development:	It contributes to make him or her a researcher who can conduct scientific research by providing knowledge and skills about laboratory techniques used in histology discipline.	
20	Learning Outcomes:		
		1	Comprehend the principles and protocols of immunohistochemical techniques
		2	Determine antibodies, blocking agents and AR methods to be used in multiple immunohistochemical techniques
		3	Choice the appropriate immunohistochemical protocol to be used in experimental studies
		4	Provide solutions to problems arising during labeling protocols
		5	Employ light and fluorescence immunohistochemical techniques
		6	Perform light and fluorescence microscopic analyses in immunohistochemistry
		7	Quantitatively analyse the preparations resulted after immunohistochemical staining
		8	Comprehend the electron microscopic immunohistochemistry techniques
		9	
		10	
21	Course Content:		

	Course Content:			
Week	Theoretical	Practice		
1	Immunohistochemistry (IHC) and immunocytochemistry (ICC): Similarities and differences, Types and structures of immunoglobulins	Presentation of the immunohistochemistry laboratory and equipment		
2	Preparing Tissues for IHC Staining - Fixation, fixatives, tissue tracking, antigen retrieval	Perfusion fixation		
3	Primary and secondary antibodies: Types, characteristics	Antigen Retrieval		
4	Selection and optimization of primary antibody	Cutting Tissue Sections - cryostat		
5	Washing buffers, blocking buffers, antibody diluents, covering materials, permeabilization agents for IHC	Preparing various solutions for IHC		
6	Detection and visualization of the antigen-antibody complex - Enzyme conjugates and chromogenic substrates	Cutting tissue sections - vibrotom		
7	Detection and visualization of the antigen-antibody complex - Fluorescent probes	Cutting tissue sections - microtome		
8	Staining Protocols - Fluorescence Protocols	Indirect immunofluorescence technique on the free-floating sections		
9	Staining Protocols - Chromogenic Protocols	Indirect immunoperoxidase staining for paraffin-embedded sections		
10	Multiple Immunochemical Staining	Dual indirect immunofluorescence technique for free-		
Activites		Number	Duration (hour)	Total Work Load (hour)
12	Troubleshooting immunochemical staining procedures – background staining	14	1.00	14.00
Practicals/Labs		14	2.00	28.00
Self study and preparation of immunofluorescent preparations		1	1.00	14.00
Homeworks		0	0.00	0.00
Projects		0	0.00	0.00
Field Studies		0	0.00	0.00
Midterm presentation		0	0.00	0.00
Others		7	3.00	21.00
Final Examination	Materials:	15	1.00	15.00
Total Work Load				92.00
Total work load/ 30 hr		West Sussex:Wiley-Blackwell; 2017.		3.07
ECTS Credit of the Course				3.00
		1. Kimmelman AC, Kimmelman AC. Immunohistochemistry – A Practical Approach. 2nd edition. New York: Springer-Verlag; 2015. 4. Buchwalow IB, Böcker W. Immunohistochemistry_Basics and Methods. Berlin Heidelberg: Springer-Verlag; 2010. 5. Burns R. Immunohistochemical Protocols. 3rd edition. Totowa: Humana Press; 2005. 6. Kumar GL. Education Guide – Immunohistochemical (IHC) Staining Methods. 5th edition. California: DAKO, 2009.		
23	Assesment			
TERM LEARNING ACTIVITIES		NUMBE R	WEIGHT	
Midterm Exam		0	0.00	

Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	100.00
Total	1	100.00
Contribution of Term (Year) Learning Activities to Success Grade	0.00	
Contribution of Final Exam to Success Grade	100.00	
Total	100.00	
Measurement and Evaluation Techniques Used in the Course	Measurement and evaluation are performed according to the Rules & Regulations of Bursa Uludağ University on Undergraduate Education.	

## 24 ECTS / WORK LOAD TABLE

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	5	5	5	4	4	0	5	0	3	0	0	2	0	0	0	0
ÖK2	5	5	5	4	4	0	5	0	3	0	0	2	0	0	0	0
ÖK3	5	5	5	4	4	0	5	0	3	0	0	4	0	0	0	0
ÖK4	5	5	5	4	4	0	5	0	3	0	0	5	0	0	0	0
ÖK5	5	5	5	4	4	0	5	0	3	0	2	2	0	0	0	0
ÖK6	5	5	5	4	4	0	5	0	3	4	2	2	0	0	0	0
ÖK7	5	5	5	4	4	0	5	0	3	4	2	0	0	0	0	0
ÖK8	5	5	5	4	4	4	5	0	3	0	0	2	0	0	0	0
LO: Learning Objectives    PQ: Program Qualifications																
Contribution Level:	1 very low		2 low		3 Medium		4 High		5 Very High							