



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Production of Avian Chimeric Embryos							
Course Code		VHE659		Couse Level		Third Cycle (Doctorate Degree)			
ECTS Credit	3	Workload	75 (Hours)	Theory	2	Practice	2	Laboratory	0
Objectives of the Course		To have the student understand methods for the construction of inter-species avian chimeric embryos using chick and quail embryos and the methods used for the analysis of chimeras							
Course Content		Construction of chimeric embryos by transferring either blastodermal cells or primordial germ cells from one embryo to another in the chick and quail, histological, immunohistochemical and molecular methods used for their examination							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration, Individual Study					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading

1	Hassa, O., Aşti, R. N. (2003) Embriyoloji.Yorum Matbaacılık, Ankara.
2	Balinsky, B. I. (1975). An introduction to embryology . Saunders, Philedelphia.
3	Kierszenbaum, A. L. (2007) Histology and Cell Biology. An introduction to Pathology, Mosby, Elsevier, Kanada.
4	Wolpert, L. (1998). Principles of development. Current Biology Ltd., New York.

Week	Weekly Detailed Course Contents	
1	Theoretical	T: Cleavage divisions and development of the avian embryo between ovulation and oviposition
	Practice	U: Fertilized and unfertilized egg
2	Theoretical	T: Establishment of the area pellucida and area opaca regions
	Practice	U: Differentiation of the area pellucida and area opaca regions
3	Theoretical	T: Scoring of the avian embryo at pre-streak stages of development-I (Eyal-Giladi and Kochav staging system)
	Practice	U: Preparation of solutions and equipment used for embryo isolation
4	Theoretical	T: Scoring of the avian embryo at pre-streak stages of development-II (Eyal-Giladi and Kochav staging system)
	Practice	U: Isolation of the embryo at the blastoderm stage
5	Theoretical	T: Scoring of the avian embryo at post-streak stages of development-I (Hamburger and Hamilton staging system)
	Practice	U: Isolation of the embryo at the blastoderm stage
6	Theoretical	T: Scoring of the avian embryo at post-streak stages of development-II (Hamburger and Hamilton staging system)
	Practice	U: Isolation of the embryo at the blastoderm stage
7	Theoretical	T: Methods used for the construction of quail-chick chimeric embryos-1
	Practice	U: Removal of the area pellucid from the area opaca by cutting
8	Intermediate Exam	
9	Theoretical	T: Methods used for the construction of quail-chick chimeric embryos-2
	Practice	U: Methodology for obtaining a single cell suspension
10	Theoretical	T: Significance of the quail-chick chimeric embryo model
	Practice	U: Determination of cell counts and cell viability in single cell suspensions
11	Theoretical	T: Possible uses of the the quail-chick chimeric embryo model
	Practice	U: Transplantation of quail blastodermal cells into chick embryos
12	Theoretical	T: Histological methods used in the analysis of chimeric embryos
	Practice	U: Identification of quail cells in putative quail-chick chimeras using Feulgen staining
13	Theoretical	T: Immunohistochemical methods used in the analysis of chimeric embryos



13	Practice	U: Identification of quail cells in putative quail-chick chimeras using immunohistochemistry
14	Theoretical	T: Article discussion
	Practice	U: Article presentation
15	Theoretical	Article discussion
	Practice	U: Article presentation
16	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	2	28
Lecture - Practice	14	0	2	28
Midterm Examination	1	7	1	8
Final Examination	1	10	1	11
Total Workload (Hours)				75
[Total Workload (Hours) / 25*] = ECTS				3
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	Learns the isolation of blastodermal cells from the chick and quail embryos,
2	Learns the isolation of primordial germ cells from the chick and quail embryos,
3	Learns methods used for the construction of quail-chick chimeras by cell transplantation
4	Learns histological, immunohistochemical and molecular methods used for the examination of resulting chimeras.
5	Applies histological, immunohistochemical and molecular methods used for the examination of resulting chimeras.

Programme Outcomes (Histology and Embryology (Veterinary Medicine) Doctorate)

1	Gains expert knowledge on the function and basic histological features of cells, tissues and systems in animals.
2	Gains expert knowledge on the stages of embryonal and fetal development in both mammals and birds.
3	Based on his/her training during the Master of Science program, he/she has in depth knowledge in the field of histology/embryology as well as in areas related to his/her area of expertise.
4	Using basic knowledge gained during the undergraduate and master of science program, develops ,critically evaluates and tests novel ideas in his/her area of expertise.
5	Endowed with theoretical and practical knowledge as for the scientific research and methodology to be able to conduct an independent research project.
6	Has theoretical knowledge concerning skills (leadership, entrepreneurship, ability to reach information technologies, organization, industrial correspondence etc.). Knows laws and regulations concerning his/her area of expertise and related subjects.
7	Determines and uses laboratory equipment and consumables in a histology laboratory. Has the ability to solve problems in his/her area of expertise.
8	Has the ability to design and develop scientific methodology concerning new developments in his/her area of expertise. Has the ability to put established methods in use to tackle current problems in his/her area of expertise.
9	Designs and conducts an independent research project on his/her own.
10	Critically evaluates and reaches to a synthesis of new ideas in his/her area of expertise and related fields.
11	Uses and develops modern technologies in his/her area of expertise towards the industry in a systematic and critical manner.
12	Performs his/her expertise with the recognition of the rights and responsibilities obtained with the completion of doctorate program in histology/embryology.
13	Is able to break down new and immature ideas into simple components and suggest alternative solutions by using his/her ability to recognize possible relationships among these components.
14	If the need arises, designs an interdisciplinary research project , forms a team, leads and finalizes the research project to solve an old or a new problem in the field of histology/embryology.
15	Attends to activities such as congresses, panels, symposiums, workshops, seminars, journal clubs in his/her area of expertise, shares information in his/her area of expertise and contributes to the solution of a problem by interacting with experts in other fields.
16	Expands a growing body of information in his/her area of expertise by publishing scientific articles in national and international journals.
17	Is in recognition of taking professional and ethical responsibilities.
18	Develop new ideas and methods that has the potential to ignite social and cultural progress or add values to the information society by using practical and theoretical knowledge gained throughout his/her training and his/her skill to work independently and to take responsibilities.



19	Makes the concept of life-long learning a matter of principle and recognizes the fact that evidence-based information is the most important gain of education.
20	Provides information and manages information exchanges on issues of public and animal health in committees with the aim of defining and solving a problem using his/her expertise.

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4
P1	2	2	2	2
P2	5	5	5	5
P3	3	3	3	3
P4	1	1	1	1
P5	4	4	4	4
P6	3	3	3	3
P7	3	3	3	3
P8	4	4	4	4
P9	4	4	4	4
P10	2	2	2	2
P11	2	2	2	2
P12	5	5	5	5
P13	4	4	4	4
P14	3	3	3	3
P15	5	5	5	5
P16	3	3	3	3
P17	3	3	3	3
P18	1	1	1	1
P19	4	4	4	4
P20	4	4	4	4

