



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

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|--|---|--------------|------------|--------|--------------------------------|----------|---|------------|---|
| Course Title | Development of Primordial Germ Cells in Mammalian Embryos and Transgenic Technology | | | | | | | | |
| Course Code | VHE656 | Course Level | | | Third Cycle (Doctorate Degree) | | | | |
| ECTS Credit | 3 | Workload | 75 (Hours) | Theory | 2 | Practice | 0 | Laboratory | 0 |
| Objectives of the Course | Development of primordial germ cells and their migration to the gonadal anlage, production of transgenic animals through pronuclear injection, production of transgenic animals by using embryonic stem cells, applications of the transgenic technology to farm animals. | | | | | | | | |
| Course Content | Development of primordial germ cells and their migration to the gonadal anlage, production of transgenic animals through pronuclear injection, production of transgenic animals by using embryonic stem cells, applications of the transgenic technology to farm animals. | | | | | | | | |
| Work Placement | N/A | | | | | | | | |
| Planned Learning Activities and Teaching Methods | Explanation (Presentation), Discussion, Individual Study | | | | | | | | |
| Name of Lecturer(s) | | | | | | | | | |

Assessment Methods and Criteria

| Method | Quantity | Percentage (%) |
|---------------------|----------|----------------|
| Midterm Examination | 1 | 30 |
| Final Examination | 1 | 70 |

Recommended or Required Reading

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| 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. |
| 5 | Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter, P. (2008). Molecular Biology of the Cell, Garland Science, U.S.A |

Week Weekly Detailed Course Contents & Teaching Methods

| Week | Weekly Detailed Course Contents & Teaching Methods | |
|------|--|--|
| 1 | Theoretical | Mammalian embryo development at pre-implantation stages of development |
| 2 | Theoretical | Origin and differentiation of primordial germ cells |
| 3 | Theoretical | Migration of primordial germ cells to gonads |
| 4 | Theoretical | Growth factors affecting the development and proliferation of primordial germ cells |
| 5 | Theoretical | In vitro culture of primordial germ cells and establishment of embryonal germ cell lines |
| 6 | Theoretical | Charecterization of embryonal germ cell lines |
| 7 | Theoretical | Cryoprotection of embryonal germ cell lines |
| 8 | Theoretical & Practice | Repetition of subjects and Midterm exam |
| 9 | Theoretical | Transfection of eukaryotic cells |
| 10 | Theoretical | Methods used for transferring a foreign gene to embryonal germ cells |
| 11 | Theoretical | Selection of transfected embryonal germ cells |
| 12 | Theoretical | Transfer of genetically modified embryonal germ cells to a recipient embryo |
| 13 | Theoretical | Molecular tests used for the identification of transgenic offspring |
| 14 | Theoretical | Applications of the transgenic technology to farm animals. |
| 15 | Final Exam | Final exam |

Workload Calculation

| Activity | Quantity | Preparation | Duration | Total Workload |
|---------------------|----------|-------------|----------|----------------|
| Lecture - Theory | 13 | 0 | 1 | 13 |
| Reading | 6 | 0 | 2 | 12 |
| Midterm Examination | 1 | 15 | 1 | 16 |



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|---|---|----|---------------------------------------|----|
| Final Examination | 1 | 33 | 1 | 34 |
| | | | Total Workload (Hours) | 75 |
| | | | [Total Workload (Hours) / 25*] = ECTS | 3 |
| *25 hour workload is accepted as 1 ECTS | | | | |

Learning Outcomes

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|---|---|
| 1 | Gains expert information on cellular and molecular mechanisms governing primordial germ cell development in mammals |
| 2 | Learns methods used for the production of chimeric embryos through the transplantation of embryonal germ cells to a recipient embryo. |
| 3 | Understands principles of the transgenic technology. |
| 4 | Learns methods used for the production of transgenic offspring by using embryonal germ cells. |
| 5 | Follow the recent developments in the development of primitive gender cells in mammalian animals and transgenetic technology. |

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

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|----|--|
| 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 | 4 | 4 | 4 | 4 |
| P4 | 5 | 5 | 5 | 5 |
| P5 | 5 | 5 | 5 | 5 |
| P6 | 3 | 3 | 3 | 3 |
| P7 | 3 | 3 | 3 | 3 |
| P8 | 5 | 5 | 5 | 5 |
| P9 | 4 | 4 | 4 | 4 |
| P10 | 4 | 4 | 4 | 4 |
| P11 | 5 | 5 | 5 | 5 |



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|-----|---|---|---|---|
| P12 | 4 | 4 | 5 | 4 |
| P13 | 4 | 4 | 4 | 4 |
| P14 | 4 | 4 | 4 | 4 |
| P15 | 3 | 3 | 3 | 3 |
| P16 | 4 | 4 | 4 | 4 |
| P17 | 5 | 5 | 5 | 5 |
| P18 | 5 | 5 | 4 | 5 |
| P19 | 5 | 5 | 5 | 5 |
| P20 | 3 | 3 | 3 | 3 |

