



Philadelphia University
Faculty of Science
Department of Biotechnology and Genetics Engineering
Second semester, 2009/2010

Course Syllabus

Course Title: Cytogenetics	Course code:240335
Course Level: 3rd level	Course prerequisite (s) and/or corequisite (s): Human Genetics 240234
Lecture Time:10:10-11:00 Sunday	Credit hours:1

Academic Staff

Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr.Raida W.Khalil	Assistant Professor	906 Head of Department office	10-13.00 Tuesday	r_khalil@philadelphia.edu.jo Biotechnology Students stdbio@philadelphia.edu.jo

Course module description:

This module is a major (Mandatory) Departmental course for the third year. This course deals with the study of Chromosomes and provides the cytological explanation of different genetic disease. Chromosome studies are an important laboratory diagnostic procedure in prenatal diagnosis, in certain patients with mental retardation and multiple birth defects, in patients with abnormal sexual development, and in some cases of infertility or multiple miscarriages. Cytogenetic analysis is also useful in the study and treatment of patients with malignancies and hematologic disorders.

Course module objectives:

. On completion of the course, students should be able to:

Explain the organization and complexity of human genome at the Cytogenetic Level

Explain the nature of chromosomal abnormalities in clinical syndromes associated with cytogenetic disorders

Explain the nature of chromosomal abnormalities in the disorders of sexual differentiation

Evaluate appropriately the family pedigree and the population and ethnic aspects of inherited disorders

Estimate the risk of recurrence of various inherited disorders in affected families

Explain the essential elements of genetic counseling and indications for prenatal Diagnosis

Understand the importance of genetics in personalized medicine

Learning outcomes:

This module gives the students the opportunity to:

- Methods used to identify and analyze cytogenetic alteration.
- Cytogenetic mechanisms of disease expression.
- Cytogenetic alterations and relationship to specific clinical expression.
- Cytogenetic alteration related to development of leukemia

Course/ module components

Title: Basics of Medical of Genetics, 2003

Author(s)/Editor(s): G.P. PAL

Publishers: Aitbs Publishers

ISBN: 81-7473-220-9

Title: Chromosome Abnormalities and Genetic Counseling(2003)

Author: R.J. Gardner et al.

Publisher: Oxford University Press, USA

ISBN: 0195149602

978-0195149609

Title: Cell Biology-A laboratory Handbook,2006.

Author(s)/Editor(s):Celis,Julio E. (ed.)

Publisher: Amsterdam: Elsevier Academic Press

ISBN: 0-12-164731-5

0-12-164732-3

0-12-164733-1

0-12-164734-X

Title: Analyzing Chromosomes(basics from background to bench),2000

Author(s)/Editor(s): B. Czepulkowski

Publisher: Springer

ISBN-13: 978-0387916095

0387916091

Title: Human Chromosomes(manual of basic techniques),1989

Author(s)/Editor(s): Ram S. Verma and Arvind Babu

Publisher: Pergamon press

ISBN: 0-08-035774-1

Teaching methods:

The 16 hours in total will be mainly lectures will be given as power point presentations, educational movies and white board. Student questions and student Discussion groups are encouraged.

On completion this module students will have

Knowledge and understanding

- Knowledge of basic cytogenetic laboratory techniques necessary to prepare tissue samples or cytogenetic diagnosis.
- Understood the principles of the cell cycle and how it relates to tissue culture
- Developed an understanding of the mechanisms which contribute to cytogenetic alterations and determine the possible gametes from cytogenetic alteration in a parent

Cognitive skills (thinking and analysis).

- Appreciated and understood the implications of the most cytogenetic report that differ from normal
- Recognized the most common cytogenetic Abnormalities encountered in the population

Communication skills (personal and academic).

- Learn the principle of Genetic Counseling encountered the local society.

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 50 marks

<u>Allocation of Marks</u>		
Assessment Instruments	Mark	Date
Midterm Exam	30	
Final examination:	50	
Reports, research projects, Quizzes, Home works, Projects	20	
Total	100	

Week	Basic and support material to be covered
(1)	Human Cytogenetic history
(2)	Gene expression and Cell cycle division
(3) and (4)	The organization and complexity of human genome at the Cytogenetic Level
(5)	The Era of Chromosomes- definition and groups
(6)	Cytogenetic laboratory techniques
(7)	Prenatal Diagnosis: CVS Blood Cord Amniotic Fluid
(8) and (9)	Chromosomal abnormalities in clinical syndromes associated with cytogenetic disorders.
(10)	Mid term Exam
(11) and (12)	The mechanisms which contribute to cytogenetic alterations and determine the possible gametes from cytogenetic alteration in a parent.
(13)	Molecular Cytogenetic: FISH and Comparative Genomic Hybridization
(14) and (15)	Principle of genetic Counseling
(16)	Final Examination

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references**Websites**

<http://www.protocol-online.org/>

<http://www.accessexcellence.org/RC/VL/GG/>

http://www.ornl.gov/sci/techresources/human_Genome/launchpad/

<http://learn.genetics.utah.edu/units/disorders/karyotype/karyotype.cfm>