

Introductions/Outline /Cancer Overview

BCH 466/ 2nd Semester-1441/2020

Outline

- **Course Description:**

- This Cancer Biology course will educate students on various genetic and molecular changes normal cells undergo during transformation into malignant cancer cells. These modifications include unregulated cell proliferation, evasion of cell death, and metastasis.
- This course will describe factors that contribute to cancer development and discuss cancer prevention and currently available therapeutic treatments.

- **Student Learning Outcomes:**

- At the end of this course, students will be able to:
- Identify the main cellular mechanisms leading to initiation and progression of cancer growth.
- Describe the characteristics of cancer cells that explain high mortality rate.
- Describe six hallmarks of cancer.
- Define the role of oncogenes and mutations in cancer and explain why several types of cancer have heritable traits and family history.
- Describe the function of tumor suppressor genes.
- Discuss the cellular signaling pathways that are deregulated in tumor cells compared to normal cells
- Explain the cell cycle, its regulation, and how cell cycle dysfunction can lead to cancer.
- Identify and learn state-of-art cancer treatment approaches.

Methods of Assessment

No.	Methods of Assessment	Marks (%)
1	Mid-term examination	40%
2	Worksheet/homework/quiz	10%
3	Presentation/ Paper Discussion	10%
4	Final Exam (21-9-1441 at 9:00 AM)	40%

- **Group Presentation/ Paper Discussion:**

- Each group will consist of 2 students.
- Each group will be assigned a published peer-reviewed cancer biology journal article to analyze.
- The analysis will be presented orally during class.
- Articles will be assigned at least two weeks prior to the date of presentation.
- Each presentation will be approximately 15 minutes long, followed by 5 minutes Question and Answer period.

Examination Date:

	Date
Mid I	Tuesday 1/07/1441- 25/02/2020
Mid II	Tuesday 07/08/1441- 31/03/2020

Presentation	Tuesday 21-8-1441- 14-4-2020
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References

N	Book Names	Authors
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1	Molecular Biology of Cancer: Mechanisms, Targets, and Therapeutics	Lauren Pecorino 4 th edition, 2016
2	Biology of Cancer	RW Ruddon 4 th edition
3	The Biology of Cancer	Robert A. Weinberg 2 nd edition, 2014

No Topics

- 1 Introductions/Outline/Cancer Overview
- 2 History of Cancer Research
Cancer epidemiology; Cancer statistics
- 3 Overview of the hallmarks of cancer; properties of cancer cells
- 4 DNA structure and stability ; Regulation of gene expression
- 5 Oncogenes & tumor suppressors how they relate to the hallmarks of cancer
Growth factor signaling and oncogenes
Growth Inhibition and Tumor Suppressor Genes
- 6 p53 and Apoptosis: Master Guardian and Executioner
- 7 The cell cycle- pRb and Control of the Cell Cycle Clock
- 8 DNA structure and stability
- 9 The relationship between cancer & DNA Repair
- 10 Apoptosis and how it relates to the hallmarks of cancer
- 11 The Biology of Angiogenesis
- 12 Moving Out: Invasion and Metastasis
- 13 Cancer cell metabolism
- 14 The Biological basis of Cancer treatment; the classical approach

