# Chapter 10- Cellular Reproduction

#### Learning Objectives:

* Cell Division *(BIO I: III-3 3. Describe the structure, function and reproduction of cells, including viruses and microorganisms. BIO II: II-2. Explain the basic structures and fundamental processes of life at the molecular, cellular, and organismal levels.)*
* The Cell Cycle *(BIO I: III-3 3. Describe the structure, function and reproduction of cells, including viruses and microorganisms. III-4. Describe the major steps in a typical eukaryote cell cycle, including the details of mitosis and cytokinesis.\** *BIO II: II-2. 2. Explain the basic structures and fundamental processes of life at the molecular, cellular, and organismal levels.)*
* Control of the Cell Cycle *(BIO I: V-2. Outline representative mechanisms that cells have evolved for communicating and coordinating their functions in a living organism.\* V- 3. Explain how cell regulatory mechanisms ensure balance in living systems that interact continuously with their environments.)*
* Cancer and the Cell Cycle *(BIO I: V-2. Outline representative mechanisms that cells have evolved for communicating and coordinating their functions in a living organism.\* V- 3. Explain how cell regulatory mechanisms ensure balance in living systems that interact continuously with their environments. V-4. Apply knowledge of cellular regulatory mechanisms to explanations of aberrant cell behavior.)*
* Prokaryotic Cell Division *(BIO I: III-3 3. Describe the structure, function and reproduction of cells, including viruses and microorganisms. BIO II: II-2. Explain the basic structures and fundamental processes of life at the molecular, cellular, and organismal levels.)*

**Project 1:**

Review the information in Chapter 10.4, Cancer and the Cell Cycle with a focus on proto-oncogenes, oncogenes and tumor suppressor genes. Listed below are three different tumor suppressor genes. Choose one to research and answer the following questions.

Tumor suppressor genes: p53, p21, Rb and APC

1. Define proto-oncogene, oncogene and tumor suppressor gene.
2. Explain the function of *negative regulators* in the cell cycle.

(3) Explain the specific function of the tumor suppressor gene selected and how it relates to specific check points in the cell cycle.

Be sure to cite any source(s) of information other than the textbook.

**Project 2:**

Review the information in Chapter 10.2 with a focus on cytokinesis in plant and animal cells and Chapter 10.5 focused on binary fission. Compare the mechanisms by which separation of daughter cells occurs in (1) a plant cell, (2) an animal cell and (3) a bacterial cell.

**Project 3:**

Calculate the time spent in cell-cycle stages by working in groups of three and completing the mitosis activity at:

<https://openlab.citytech.cuny.edu/bio-oer/cell-division/mitosis-activity/>