High School Science Virtual Learning

College Biology
Chapter 11 Recap Part 2

May 1, 2020

High School College Biology
Lesson: May 1, 2020

Objective/Learning Target:
Students will be able to discuss how genes are controlled.

Let's Get Started:

1. Would a gene on the X chromosome be expressed more in human females (who have two copies of the X chromosome) than human males (who have one copy)?

2. A mutation in *E. coli* makes the *lac* operator unable to bind the active repressor. How would this mutation affect the cell? Why would this effect be a disadvantage?

Answers:

1. No, because in females one of the X chromosomes in each cell is inactivated.

2. The cell would wastefully produce the enzymes for lactose metabolism continuously, even in the absence of lactose.

Lesson Activity:

1. Read over pages 16-32 of the Chapter 20 Notes. (Linked Here)

2. Watch this Bozeman Science video on Cancer.

Practice:

1. Why is plant cloning used in agriculture?
2. What is therapeutic cloning and why might it be useful for researchers?
3. What is an oncogene?

Practice Answers:

1. Plant cloning allows the farmers to plant seeds that have been engineered to withstand drought, pests and weeds. Planting a clone ensures that all yields will be equal and have identical water and nutritional needs as well.
2. Therapeutic cloning is used to produce embryonic stem cells. Embryonic stem cells have the potential to develop into nearly any type of specialized cell and could be used to treat a wide variety of illnesses and conditions.
3. A gene that causes cancer.

More Practice:

1. The most common procedure for cloning an animal is _____.

2. What is learned from a DNA microarray?

3. Name three potential sources of stem cells?

4. What is the difference between oncogenes and proto-oncogenes? How can one turn into the other? What function do proto-oncogenes serve?

More Practice:

5. Which of the following is a substantial difference between embryonic stem cells and the stem cells found in adult tissue?

a. In laboratory culture, only adult stem cells are immortal.
b. In nature, only embryonic stem cells give rise to all the different types of cells in the organism.
c. Only adult stem cells can be made to differentiate in the laboratory.
d. Only embryonic stem cells are in every tissue of the adult body.

More Practice Answers:

1. Nuclear transplantation
2. Which genes are active in a particular sample of cells
3. Embryonic tissue (embryonic stem cells), umbilical cord blood, and bone marrow (adult stem cells)
4. Proto-oncogenes are normal genes involved in the control of the cell cycle. Mutation or viruses can cause them to be converted into oncogenes, or cancer-causing genes. Proto-oncogenes are necessary for normal control of cell division.
5. B

Review Tools:

-Kahoot 2
-Professor Dave Explains video about gene regulation.