

BOZEMAN BIOLOGY VIDEO GUIDE—Gene Regulation

Name \_\_\_\_\_ Date \_\_\_\_\_ Per \_\_\_\_\_

Define the following:

1. Regulatory gene—

2. Regulatory Sequence—

The regulatory sequence is usually found \_\_\_\_\_ of the gene.

3. Draw a strand of DNA including the following:

a. TATA box    b. Regulatory gene    c. Regulatory sequence

d. Regulatory protein (show where it binds)    e. RNA polymerase (show where it binds and which direction it goes)

4. Now draw the Lac Operon including all of the following:

a. LacZ, LacY and LacA genes    b. promoter    c. operator    d. repressor

5. The operator is like an \_\_\_\_\_ switch. It regulates whether we turn the gene on or not.

6. When the repressor binds to the operator, the operator is in the \_\_\_\_\_ position.

6a. When there is no lactose present, the bacteria don't need to make the genes that digest lactose, but when the lactose is present, it binds to the \_\_\_\_\_ and changes its shape so that it doesn't fit into the \_\_\_\_\_ anymore.

6b. With the repressor removed, \_\_\_\_\_ can attach to the \_\_\_\_\_ and start to make mRNA from each of the three gene.

7. The Lac operon is an example of \_\_\_\_\_ control.

8. Draw the Trp operon including all of the following:

- a. TrpE, TrpD, TrpC, TrpB, TrpA genes    b. promoter    c. operator    d. repressor    e. tryptophan (where it binds)

9. When the tryptophan is bound the \_\_\_\_\_, it is in the \_\_\_\_\_ position. This is because bacteria don't want to have to make tryptophan if it is already present.

9a. When tryptophan is absent, the \_\_\_\_\_ changes shape and releases from the operator. This allows \_\_\_\_\_ to bind and make the mRNA from the 5 genes.

10. Humans don't have operons, so we use \_\_\_\_\_. Some of these bind to the \_\_\_\_\_ while others bind to hold the promoter on. Even more transcription factors bind upstream and cause the DNA to \_\_\_\_\_. This action activates the \_\_\_\_\_ to make the mRNA and eventually the protein.

Got all that?????????????!

