Name:_____ Dr. Reichler's Bio 325-uex Fall 2008 Quiz 10/16

1) What is the function of many of the hox proteins?

2) If you were studying the SRY gene, coded on the Y chromosome. Could you tell when SRY begins to be expressed using a reporter gene? Would a reporter gene allow you to determine the stability of the SRY protein?

3) Would you expect the chimpanzee or human version of the huntingtin gene to be larger?

4) By looking at the DNA sequence, how would you identify a hox pseudogene?

5) What different information can be gleaned from comparing transposons between humans and chimps or different people? Why would knowing the time since the last common ancestor help you determine if you should be nervous about transposons disrupting one of your genes?

6) What might cause the DNA from two people to give the same pattern in RFLP analysis?

7) What are the four "ingredients" for doing PCR, and how does each "ingredient" allow DNA to be amplified?

8) What technique would allow you to determine in a few hours if some corn had been genetically modified with the Round-up resistance gene?

9) When preparing a eukaryotic gene for expression in bacteria, would you do PCR or reverse transcription first?

10) Would you be able to insert a gene cut with one restriction enzyme into a plasmid cut with a different restriction enzyme?

11) If you grew some transformed bacteria on X-gal, but forgot to put antibiotic, what color would you expect most of the bacteria to be?

12) How are bacteria used in the transformation of plants?

Answers on next page:

Answers:

1) They are transcription factors.

2) Reporter genes can tell when or where transcription of a gene is activated, but since the reporter gene protein is different from the SRY gene, no information about the SRY protein can be determined.

3) If we use the puffer fish-human comparison combined with the general sense that humans have more transposons then chimpanzees, we could surmise that the human huntingtin gene should have more transposons.

4) It will have some sequence similarity to active hox genes, but will lack some critical component, like a functional promoter, that keeps it from being expressed.

5) Between chimps and people we see how active transposons have been in the last 6 million years. Between different people, we can see how active transposons have been since the people shared a common ancestor. The time of the last common ancestor will allow an estimation of transposon movement per given time.

6) If the difference in their DNA is not in the sequence of the restriction enzyme used, or if they are identical twins.

7) Template DNA- will be copied. DNA polymerase- will do the copying. Nucleotides- raw material for making DNA. Primers- will direct the DNA polymerase where to begin copying.

8) Successful amplification of the Round-up® resistance gene by PCR using primers specific for this gene.

9) RT first to make the cDNA then PCR to amplify the gene you want to clone.

10) Not if the sticky ends do not match. Non-complementary sticky ends will keep the gene of interest and the plasmid from coming together for ligase to make covalent bonds.

11) White. Even the bacteria without the plasmid will survive, and no plasmid means no lacZ to make the blue color. There may be a few blue colonies representing transformed bacteria with the plasmid containing the intact lacZ gene.

12) We can use Agrobacterium to transform the plants.