Correct answers for Lab Quiz #4

1. The image shows an agarose gel being loaded with a DNA-loading dye mixture. The process represented is **gel electrophoresis**.

2. The image shows two electrophoresis gel boxes attached to a power supply. The DNA will travel toward the **anode or positive electrode** because it has a slight negative charge.

3. The image shows DNA being mixed with dye on a piece of parafilm. The two functions of the dye are 1) making the sample visible to the naked eye so students can see where it is when loading the wells in the agarose gel and 2) allowing observers to keep track of where the DNA is as it moves down the gel. The DNA is not visible, but the dye samples are and all of our DNA samples travel at a pace slower than the bromphenol blue so will stay between it and the wells.

4. The image shows an agarose gel with six DNA samples made visible with ethidium bromide and UV light. **Lane 4** contains the bacteriophage lambda DNA cut with the restriction enzyme HindIII.

5. The image is the same as that used for question #4. Lane #1 contains the plasmid pUC19 and lane #3 contains the plasmid pGLO. The plasmid pUC19 is smaller (2686 bp as opposed to 5374 bp).

6. An enzyme that can catalyze reactions resulting in the breaking of phosphodiester bonds in a "site-specific manner" is called a **restriction endonuclease** or **restriction enzyme**.

7. The name of the third enzyme found in *Xenopsylla mendocinensis* strain N would **be *Xme*N III**. If you wrote 3 rather than using a Roman numeral you received 0.5 points rather than 1.

8. The image shows a short, DNA nucleotide sequence with the letters "GAATTC" (reading 5' to 3') as yellow-colored. The yellow colored section represents a **recognition sequence** and is **where a restriction enzyme will bind to cut the DNA** (usually within that sequence, but not always).

9. The image shows a nitrogenous base before and after the addition of a methyl group. Enzymes that add methyl groups to DNA are called **modification enzymes** and they modify cellular DNA so that restriction enzymes made in that cell cannot cut it (they **protect "self" DNA** from destruction).

10. The image shows a set of RFLP patterns with a 1Kb ladder in lane #6. To generate RFLP patterns, samples of 16S rDNA can be cut with the enzyme AluI and the resulting restriction fragments can be run in a gel to separate them on the basis of size.

11. The image shows an agarose gel containing DNA samples stained with ethidium bromide. The bright pink-orange color is from the **ethidium bromide**.