

Key to Lecture Quiz #4

1. **Define transformation**, name the individual who initially discovered this process as it occurs in bacteria and explain what they were doing at the time.

Transformation is a horizontal gene transfer mechanism that occurs in bacteria and involves the transfer of DNA from dead donor cells to living recipients. The process was discovered by Frederick Griffith (1928) while he was conducting experiments in an attempt to develop a vaccine against pneumonia.

2. **Define prion** and describe how prions reproduce within animal host cells.

Prions are infectious proteins that can enter organisms through a variety of means (ingestion, contaminated surgical instruments, transplanted tissues, etc.). The proteins are taken up by cells through endocytosis, but **reproduce themselves inside cells** by causing the secondary structure of normal cell proteins with the same primary structure (same amino acid sequence) to change from more alpha-helices to more beta-sheets.

3. **Define lysogeny** and explain what occurs when a bacterial population has experienced lysogenic conversion.

Lysogeny is a condition that exists when a bacteriophage genome has become incorporated into the chromosome of a host cell. The virus is then called a **prophage** and the bacterium is called a **lysogenic cell**. If a bacterial population exists in this condition and experiences **lysogenic conversion**, this means the population has developed a **new phenotype** because the cells are **expressing viral genes**. A common result of lysogenic conversion is the ability to produce potent protein exotoxins.

4. Fuse to form a zygote/ homologous/ restriction endonuclease (If you answered just "fuse" in the first blank, and just "restriction" in the last blank those answers were accepted as correct.)
5. Recombinant – Several people spelled this term incorrectly.
6. Conjugation/ male (If you answered F-plus in the second blank that answer was accepted as correct because F-plus is male, but that result would not be an option under the circumstances described.)
7. Diploid
8. Generalized transduction/ prophage
9. Viroids

10. Virion/ capsid
11. Adsorption or attachment – Host specificity occurs because receptors on the bacteriophage surface can only interact (bind) with specific receptors sites on the host cell surface (ligands). Glycoproteins often serve as receptor sites on host cell surfaces, but other structures, e.g., flagella, are sometimes used.
12. Penetration/ transcription/ translation
13. Assembly – Although the name of the life-cycle stage is either assembly or maturation, the correct answer here is assembly. Viral components are assembled to make new virions.
14. The etiological agents of epidemic typhus are identified as *Rickettsia prowazekii*.