Mastery Series: Antibiotic Resistance

1. What is a typical way that bacteria acquire genes for antibiotic resistance?
2. How do microbes exchange plasmids?
3. 4 methods that bacteria may utilize in antibiotic resistance.
4. List 5 species of bacteria that are well-known (or infamous) for antibiotic resistance.
5. Penicillin works by inhibiting cell wall formation. It generally works against *Streptococcus* but not against *Staphylococcus*. Why?
6. What must be different between the DNA of *Streptococcus* and *Staphylococcus* in regard to sensitivity to penicillin?
7. Vancomycin normally works by inhibiting cell wall formation in *Enterococcus*. Some strains of *Enterococcus* are resistant to vancomycin. What is the probable reason that *Enterococcus* is resistant?

Mastery Series ANSWERS: Antibiotic Resistance

1. What is a typical way that bacteria acquire genes for antibiotic resistance?
   ***plasmids**
2. How do microbes exchange plasmids?
   ***pili**
3. 4 methods that bacteria may utilize in antibiotic resistance.
   ***build their cell wall a different way**
   ***use a different metabolic pathway**
   ***pump out the antibiotic**
   ***make an enzyme that deactivates the antibiotic**
4. List 5 species of bacteria that are well-known (or infamous) for antibiotic resistance.
   MRSA: methicillin-resistant Staphylococcus aureus
   VRE: vancomycin-resistant Enterococcus
   Pseudomonas aeruginosa
   Mycobacterium tuberculosis
   Clostridium dificile
   Klebsiella pneumoniae

5. Penicillin works by inhibiting cell wall formation. It generally works against *Streptococcus* but not against *Staphylococcus*. Why?
   Many strains of Staph make penicillinase, an enzyme that deactivates penicillin
6. What must be different between the DNA of *Streptococcus* and *Staphylococcus* in regard to sensitivity to penicillin?
   ***many strains of Staph have a gene that codes for a protein called Penicillinase; penicillin-sensitive Strep does not have this gene.**
7. Vancomycin normally works by inhibiting cell wall formation in *Enterococcus*. Some strains of *Enterococcus* are resistant to vancomycin. What is the probable reason that *Enterococcus* is resistant?
   ***It has another method to build its cell wall that vancomycin does not inhibit.**