DISSEMINATION OF ANTIBIOTIC RESISTANCE I: GENOMES

Date:  Wednesday, August 15, 2018 – 10:30 am

Reading Assignment: **Medical Microbiology**, 8th Ed., Murray, Rosenthal, Pfaller

Pages 128 and 129 include short descriptions of plasmids, bacteriophages and transposons. Fig. 13-11 is useful. Also relevant parts of Figs. 13-12 and 13-13. But, Fig. 13-10 is not. Also, do not read the book’s comparison between bacteria and eukaryotes (pp. 106 and Table 12-1) – the information is woefully out of date.

KEY CONCEPTS AND LEARNING OBJECTIVES:

A. **Educational Goal**

After completing the readings and attending the lectures, you will be able to compare and contrast the genomes of bacterial chromosomes, plasmids, and viruses, describe how they can contribute to the virulence of a pathogen, explain how such genomes can change, and describe the clinical consequences of such change.

B. **Educational Objective**

To attain these goals, you will be able to:

1. Compare & contrast the structure of eukaryotic and bacterial chromosomes.
2. Compare & contrast the structure and function of the bacterial chromosome, the plasmid genome, and the bacteriophage genome.
3. Compare & contrast transposable elements.
4. Explain how transposable elements contribute to the dissemination of antibiotic resistances.
5. Describe why R plasmids represent the major reason for the proliferation of multiple antibiotic resistance.
CONTENT SUMMARY

I. Introduction

II. Fundamental genetic organization (eukaryotic versus prokaryotic)
   A. Chromosomal genome
   B. Plasmid genome
      1. Clinical relevance
      2. Conjugative plasmid
      3. Non-conjugative plasmid
   C. Viral genome
      1. Clinical relevance
      2. Lytic infection
      3. Lysogenic infection

III. Transposition
   A. Clinical relevance
   B. Types of transposable elements