

Prokaryotic Cells

Chapter 3

I. Overview

II. Prokaryotic Cells

A. Size, Shape, and Arrangement

1. size

2. morphology

- a. coccus
- b. bacillus
- c. coccobacilli
- d. spiral
 - 1) vibrio
 - 2) spirilla
 - 3) spirochete
- e. others
- f. shape retention
 - 1) monomorphic
 - 2) pleomorphic

3. arrangement

- a. diplo
- b. strepto
- c. tetrads
- d. sarcinae
- e. staphylo
- f. palisades

B. External Structures

1. Glycocalyx

- a. construction
 - 1) capsule
 - 2) slime layer
- b. function
 - 1) virulence
 - 2) attachment

2. S-layer

3. Flagella

- a. function
- b. structure
 - 1) filament
 - 2) hook
 - 3) basal body
 - a) rotation
- c. arrangements
 - 1) atrichous
 - 2) monotrichous
 - 3) lophotrichous
 - 4) amphitrichous
 - 5) peritrichous
- d. motility
 - 1) stimulation = taxis
 - a) chemotaxis
 - 2) runs
 - 3) tumbles
- e. Note

- 4. Flagella like
 - a. function
 - b. fimbriae
 - c. pili
 - 1) conjugation
- C. The Cell Wall
 - 1. function
 - 2. peptidoglycan
 - 1) lysis
 - 3. Gram + Cell Wall
 - a. teichoic acid
 - 4. Gram - Cell Wall
 - a. plasma membrane
 - b. periplasm
 - c. outer membrane
 - d. lipopolysaccharide
 - 1) endotoxin
 - 5. Note
 - 6. Gram Stain Mechanism
 - 7. Atypical Cell Walls
 - a. no cell wall
 - 1) Mycoplasmas
 - b. Archaea Cell Walls
 - c. Acid-Fast Cell Walls
 - 1) mycolic acid
 - 8. protoplast
 - a. lysozyme
- D. Structures Internal to the Cell Wall
 - 1. cytoplasmic membrane
 - a. composition
 - 1) lipid bilayer
 - 2) protein
 - a) peripheral
 - b) integral
 - 3) steroids
 - 4) carbohydrates
 - 5) fluid mosaic model
 - b. selectively permeable
 - 2. cytoplasm
 - 3. nucleoid
 - a. plasmids
 - 4. ribosomes
 - 5. inclusion bodies
 - 6. cytoskeleton
 - 7. endospores
 - a. sporulation
 - b. germination