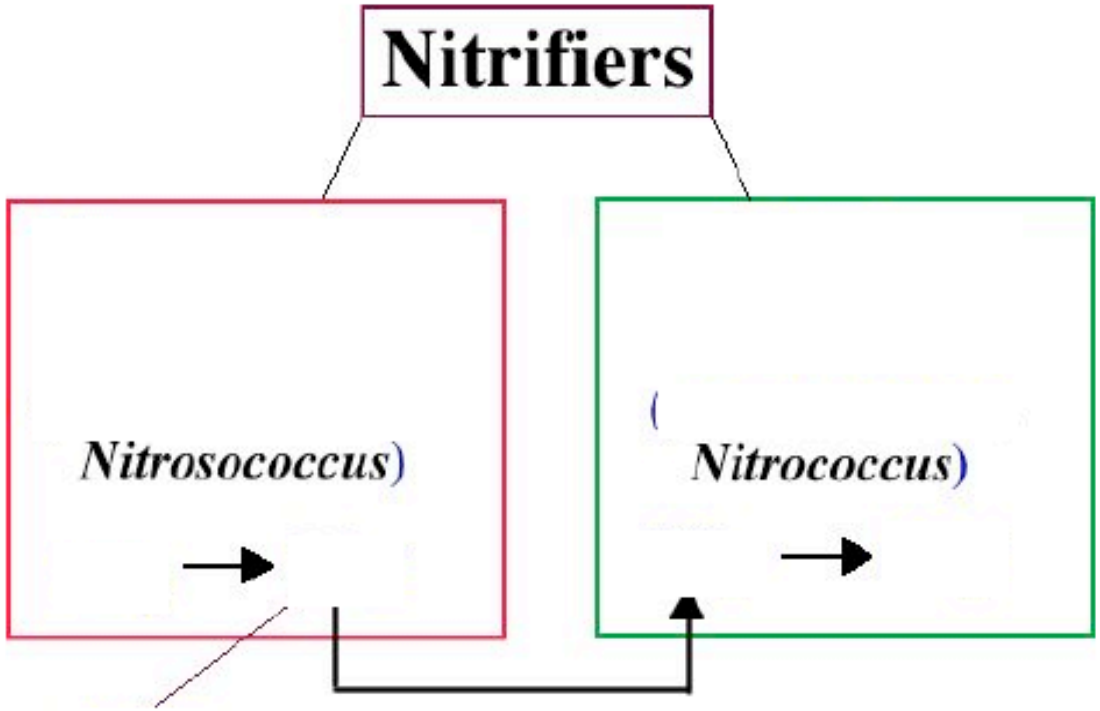
Lecture 24: Survey of Bacteria (continued)

IV. Aerobic Chemoautotrophs

Phylum: Proteobacteria, Bergey's Manual: Volume 2

A. Obtain energy by (NH_3 or NO_2^-). As a group, these bacteria can oxidize all the way to This is a process called .



B. bacteria with a variety of cell (rod, ellipsoidal, spherical, spirillar or lobate). Often they are via polar or peritrichous flagella.

C. Can be isolated from soil, freshwater and marine habitats. Because each oxidation reaction consumes oxygen, waters with a lot of nitrogenous waste can quickly become

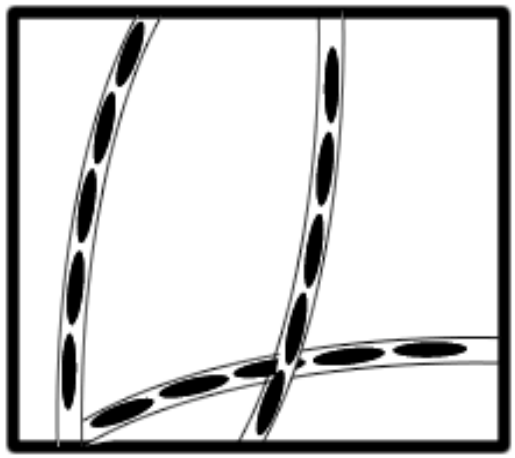
Fig. 22.11

VI. Thriving in aquatic environments

A. bacteria = chains of cells (sheath).

Phylum: Proteobacteria, Class: β-proteobacteria, Order: Burkholderiales

Bergey's Manual: Volume 2



Sheath is close fitting but never in

1. Functions of a sheath

   a. Help bacteria , such as plants and rocks, and

   from running water.

   b. bacteria from predators.

2. Some representative genera include *Sphaerotilus* and *Leptothrix* both of which are .

3. Single motile cells, called , can escape from a sheath, attach to another solid surface and form .

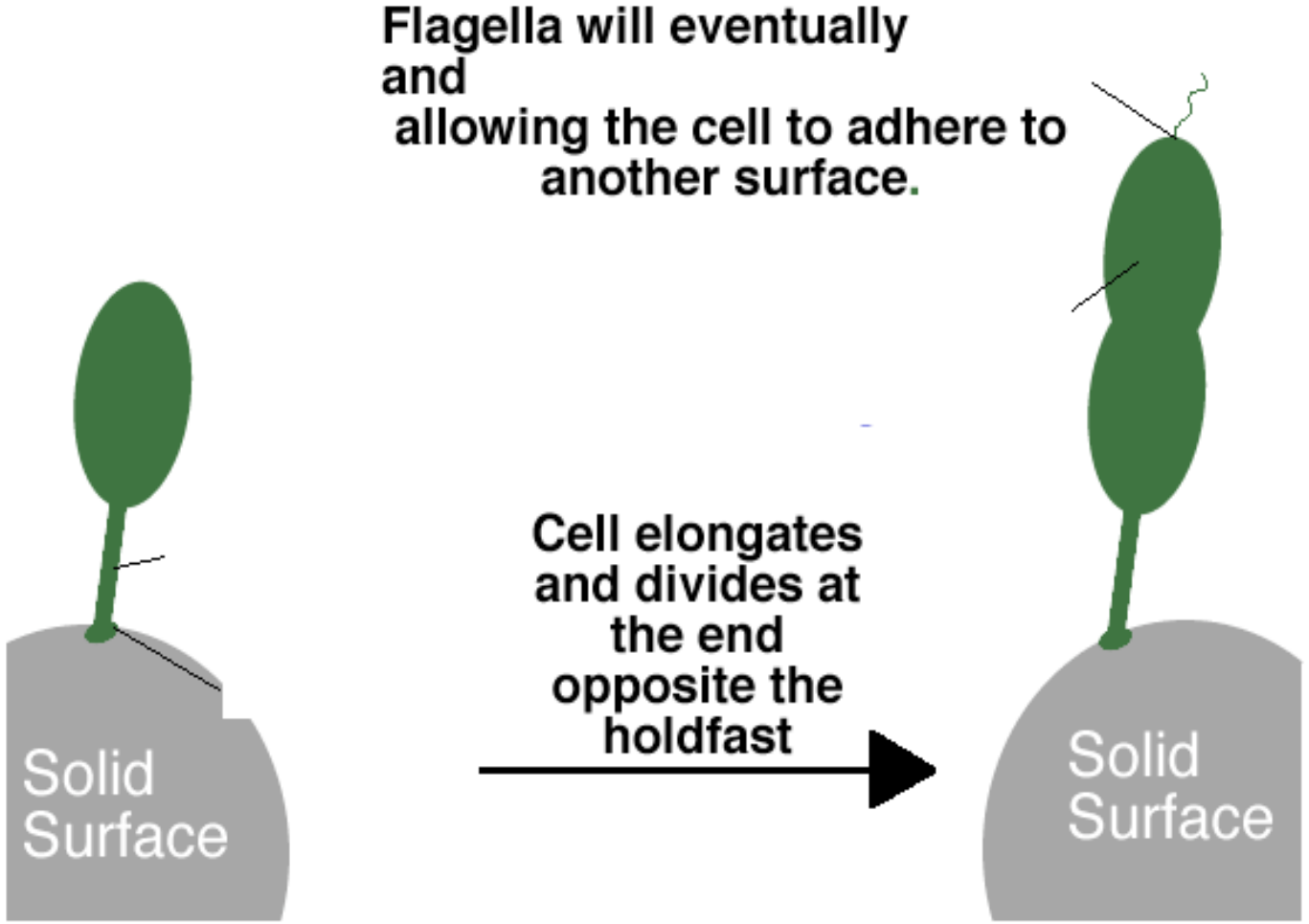
B. Bacteria

Phylum: Proteobacteria, Class: α-proteobacteria

Bergey's Manual: Volume 2

-Have projections called prosthecae that provide and sometimes allow cells to to solid surfaces.

The genus *Caulobacter*



C. Bacteria that derive nutrients from other organisms.

The genus

Phylum: Proteobacteria, Class: γ-proteobacteria, Order: Bdellovibrionales

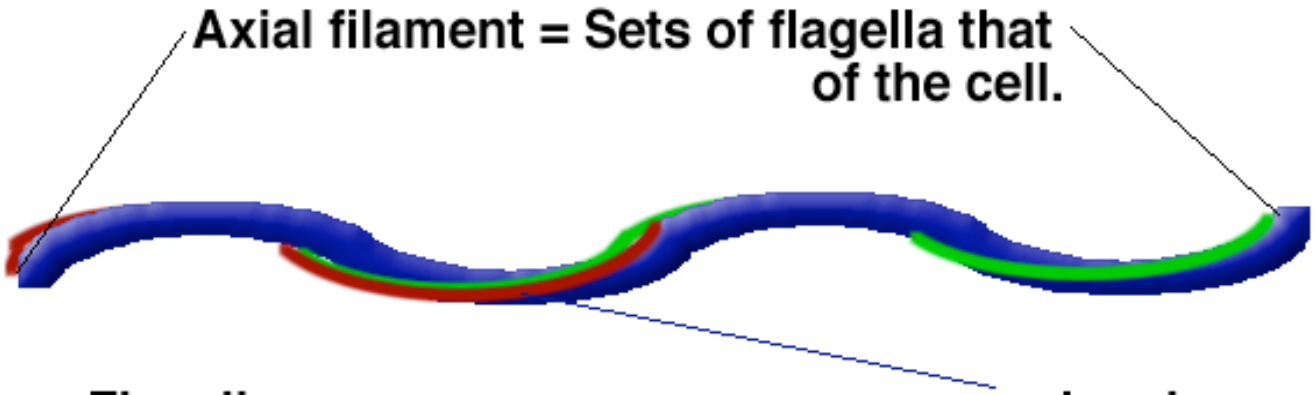
Bergey's Manual: Volume 2

1. Small, Gram-negative, aerobic, that are via polar flagella. They derive their nutrients by on *E.coli* and other Gram-negative bacteria.
2. The HUNT and KILL
   a. *Bdellovibrio* swims along very rapidly until it
   b. It attaches to the host and begins while secreting enzymes that of the host.
   c. It in the host cell wall and lodges itself in the at which point it looses its flagellum.
   d. *Bdellovibrio* of the host cell, utilizing all of its growth factors for nutrients and .
   e. Soon the host cell lysis and *Bdellovibrios* to prey on other cells.

D. Bacteria that move by unusual mechanisms

Phylum: Spirochaetes, Bergey's Manual: Volume 5

1. Gram-negative, , highly flexible cells.
2. Cells are :



*The axial filament lies and thus rotation of the flagella is thought to cause the cells to move like

3. Some genera are (*Leptospira*) and some form associations with other organisms (in the hindguts of termites). The spirochete *Treponema pallidum* causes and *Borrelia burgdoferi* causes