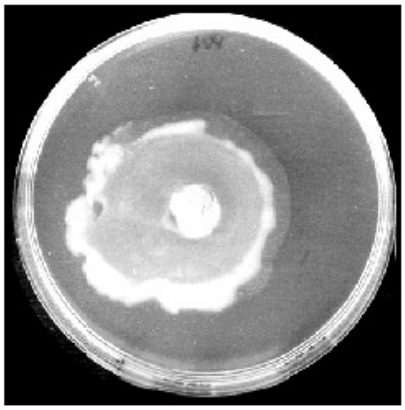


Figure 1. A swarming colony of *S. liquefaciens* approx. 600 min after inoculation. The agar concentration is 0.6% (w/v) and the casamino acid concentration is 0.2% (v/v). The shading is due to the light source reflecting off of the surface of the mostly transparent culture.

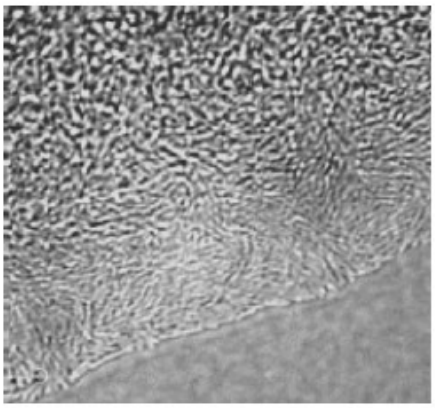


Figure 2. Close-up of the edge of a swarming colony. A monolayer of long, fast moving swarmer cells is visible at the edge of the colony.

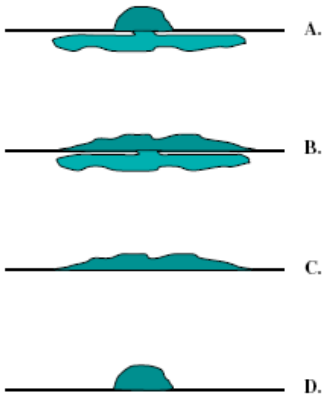
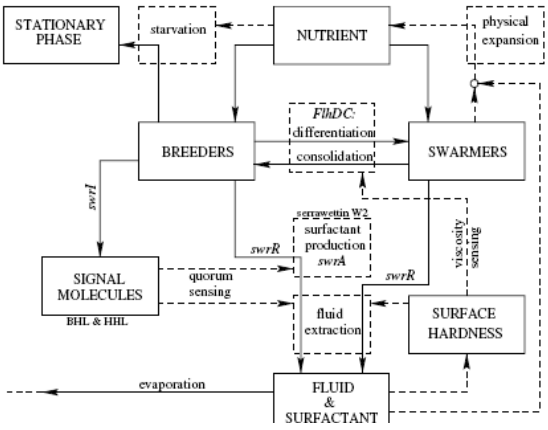
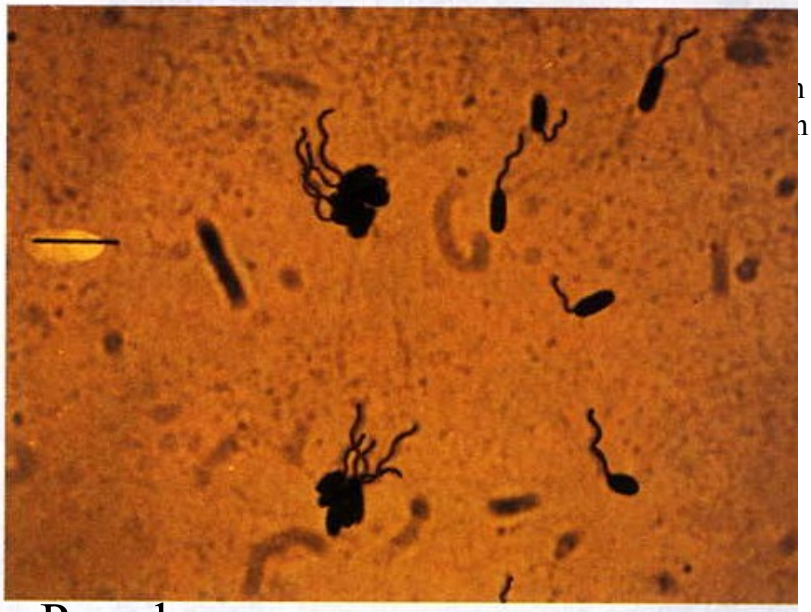
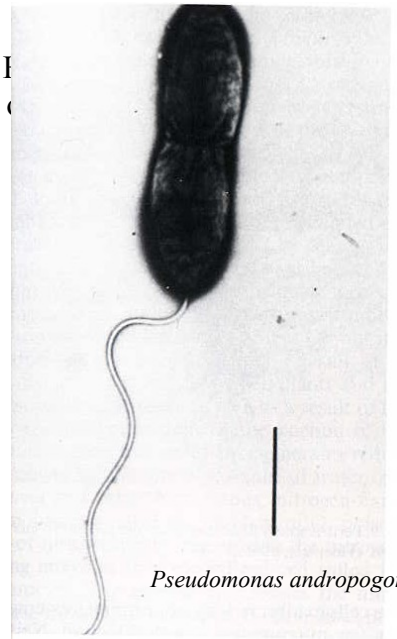


Figure 5. Different morphologies of the colony under different growth conditions quantified by the agar concentration (ac). (a) Diffuse submerging with well-packed non-swarmer colony on surface; very soft surface, ac < 0.4%. (b) Diffuse submerging with swarmer colony on surface; soft surface, 0.4% < ac<0.6%. (c) Swarmer colony on surface only; intermediate surface hardness, 0.6% < ac < 1.2%. (d) Well-packed non-swarmer colony on surface; hard surface, 1.2% < ac.



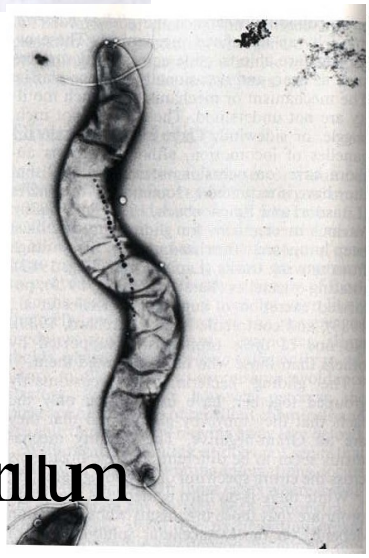


(a)Pseudomonas

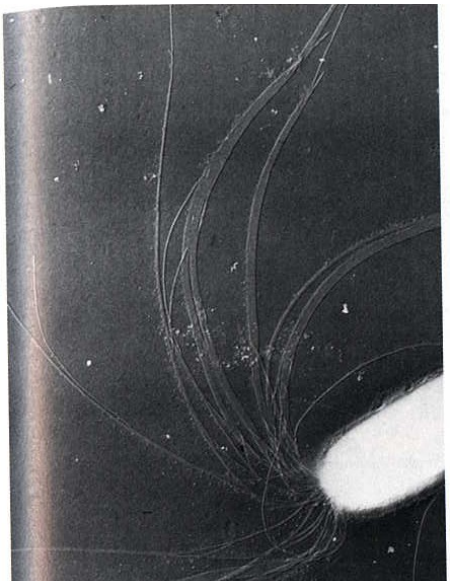


Pseudomonas andropogonis

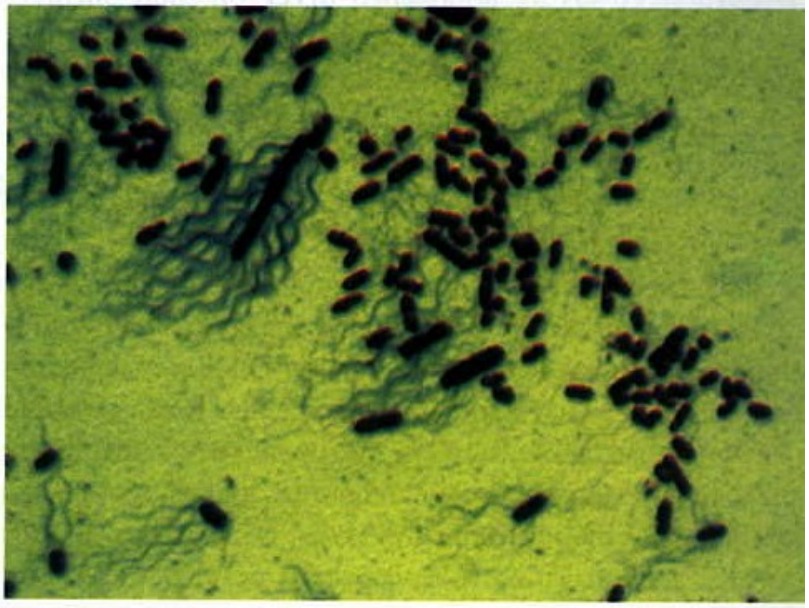
(b)



Spirillum



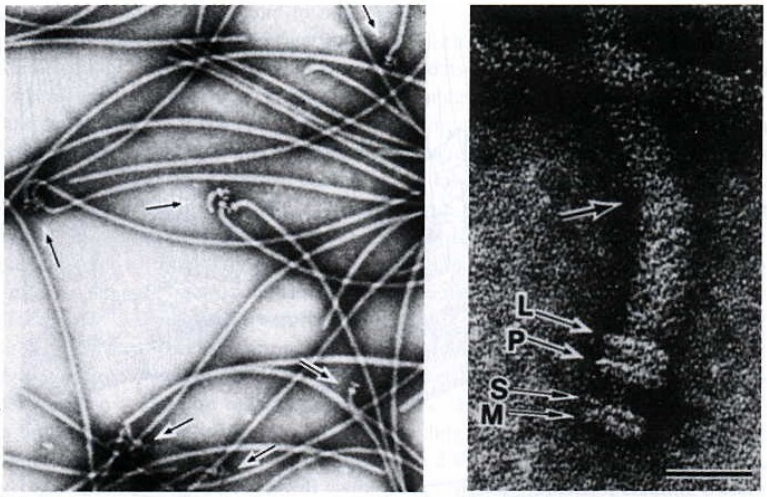
Spirillum volutans



(c)

Figure 3.33 **Flagellar Distribution.** Examples of various patte flagellation as seen in the light microscope. (*a*) Monotrichous pol (*Pseudomonas*). (*b*) Lophotrichous (*Spirillum*). (*c*) Peritrichous (*Proteus vulgaris*, ×600). Bars = 5 µm.

3.34 **The Ultrastructure of Negative Flagella.** (*a*) Negatively stained from *Escherichia coli* (×66,000). Arrows the location of curved hooks and basal (*b*) An enlarged view of the basal body of *li* flagellum (×485,000). All four rings and M) can be clearly seen. The uppermost at the junction of the hook and filament.) nm.



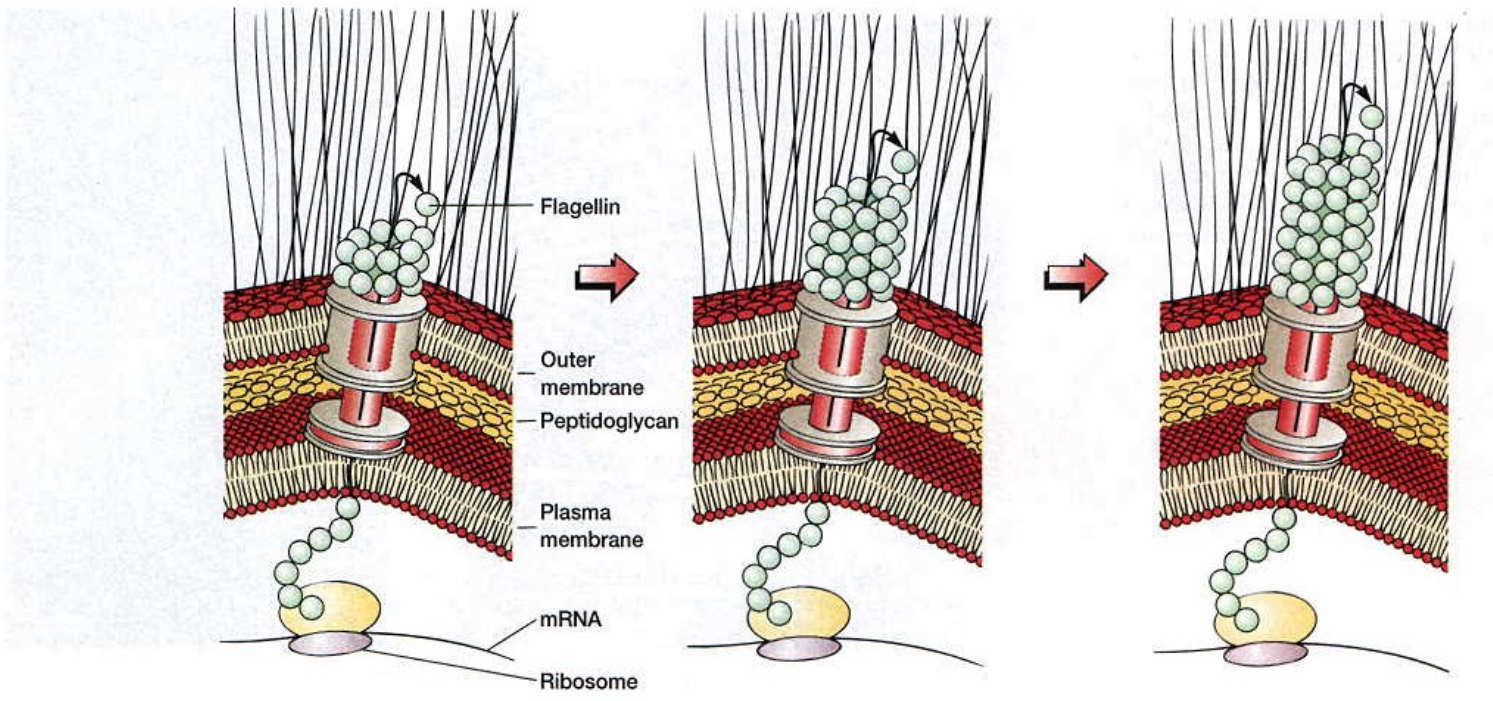
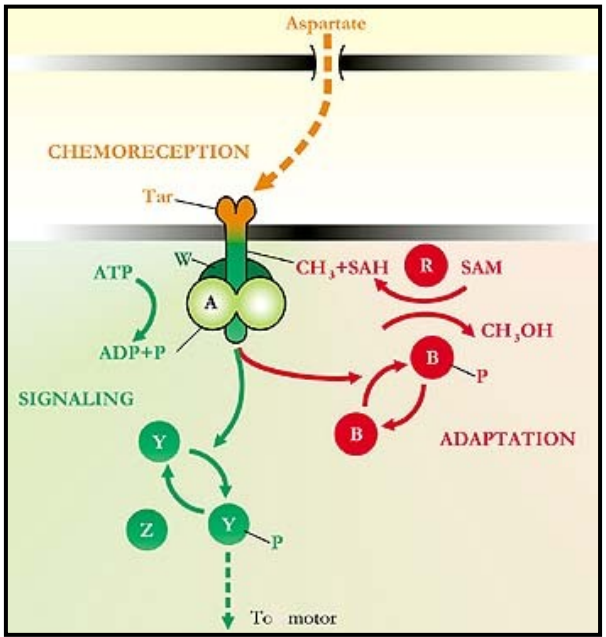


Figure 3.36 Growth of Flagellar Filaments. Flagellin subunits travel through the flagellar core and attach to the growing tip.



Chemotaxis
This diagram shows some of the components required for chemotaxis toward the **amino acid aspartate**. Information flows from the outside of the cell (shown at the top) by way of **porins**, the periplasmic space, and the cytoplasmic membrane, to the inside of the cell (shown at the bottom), and then to the **flagellar motors** (not shown). Dashed arrows indicate **physical displacement of chemicals by diffusion**. Solid arrows indicate **chemical modifications of proteins**—phosphorylation or methylation. The cytoplasmic components, all Che proteins (**CheW, CheA, CheR, CheB, CheY, CheZ**), are identified by their fourth letter only. The receptor complex consists of two molecules of **Tar**, two of **W**, and two of **A**, with Tar spanning the cytoplasmic membrane. **Chemoreception** is depicted in orange, **signaling** in green (for "go"), **adaptation** in red (for "stop"). Tar is a protein required for taxis toward aspartate and away from certain repellents. **ATP** is adenosine triphosphate, the phosphate donor**. SAM** is S-adenosylmethionine, the **methyl donor**. The other chemicals shown are ADP, adenosine diphosphate; SAH, S-adenosylhomocysteine; CH_3, the methyl group; CH_3OH, methanol; and P, inorganic phosphate.

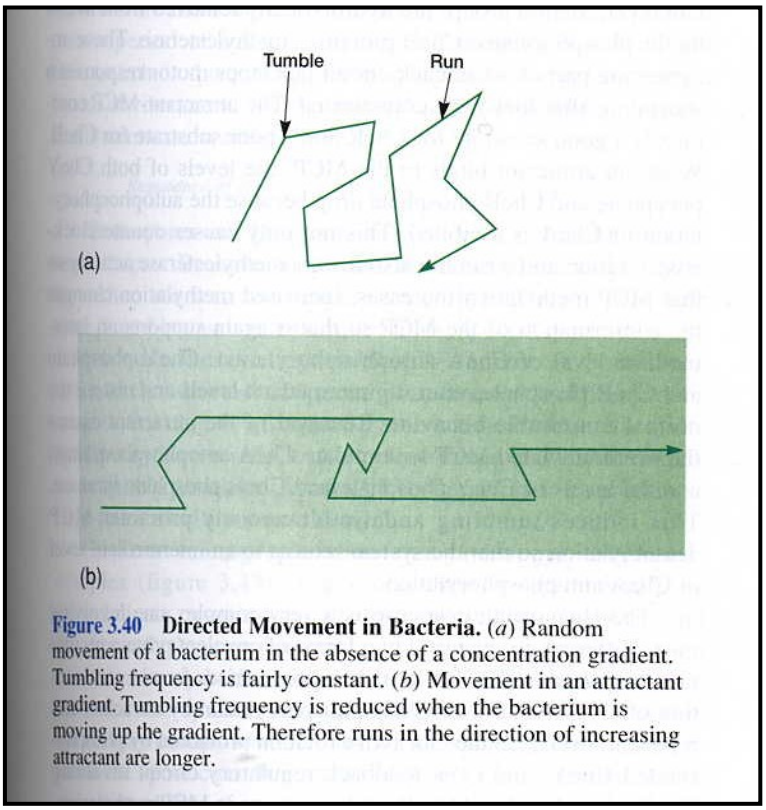


Figure 3.40 Directed Movement in Bacteria. (*a*) Random movement of a bacterium in the absence of a concentration gradient. Tumbling frequency is fairly constant. (*b*) Movement in an attractant gradient. Tumbling frequency is reduced when the bacterium is moving up the gradient. Therefore runs in the direction of increasing attractant are longer.

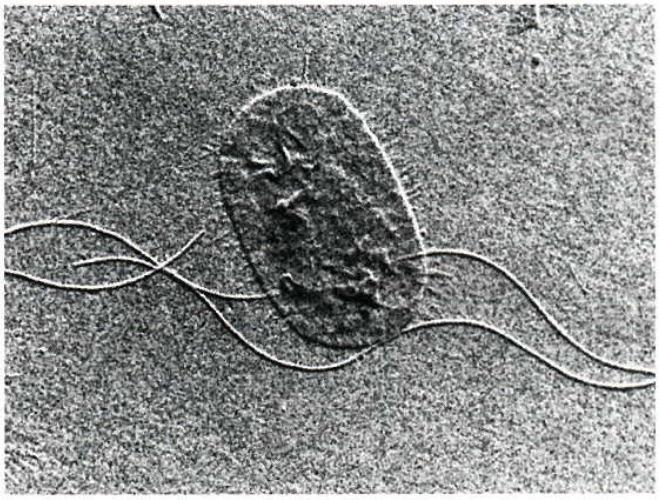


Figure 3.32 Flagella and Fimbriae. The long flagella and the numerous shorter fimbriae are very evident in this electron micrograph of *Proteus vulgaris* (×39,000).