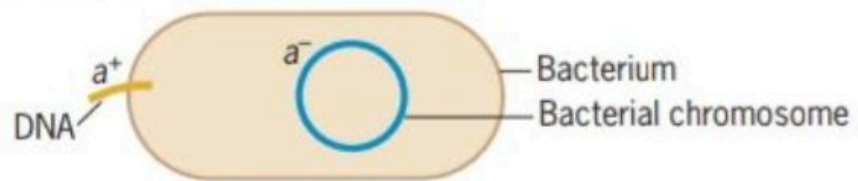
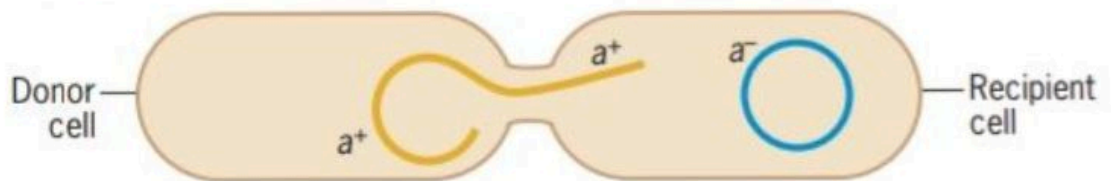


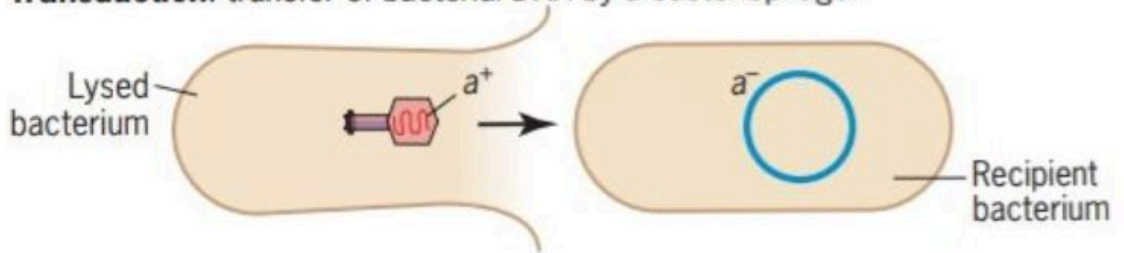
Transformation: uptake of free DNA.



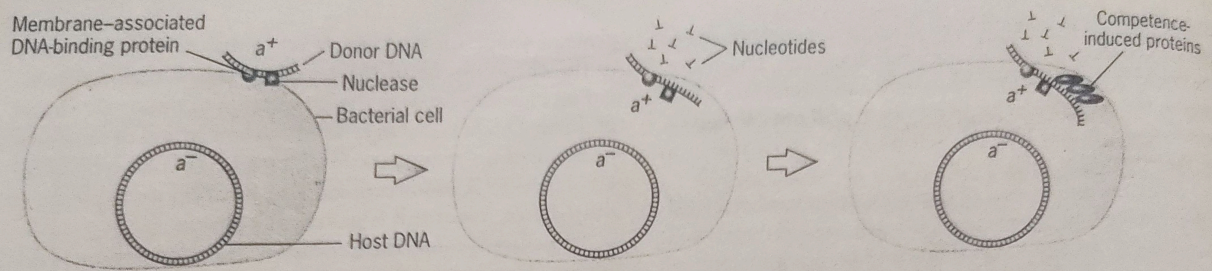
Conjugation: direct transfer of DNA from one bacterium to another.



Transduction: transfer of bacterial DNA by a bacteriophage.



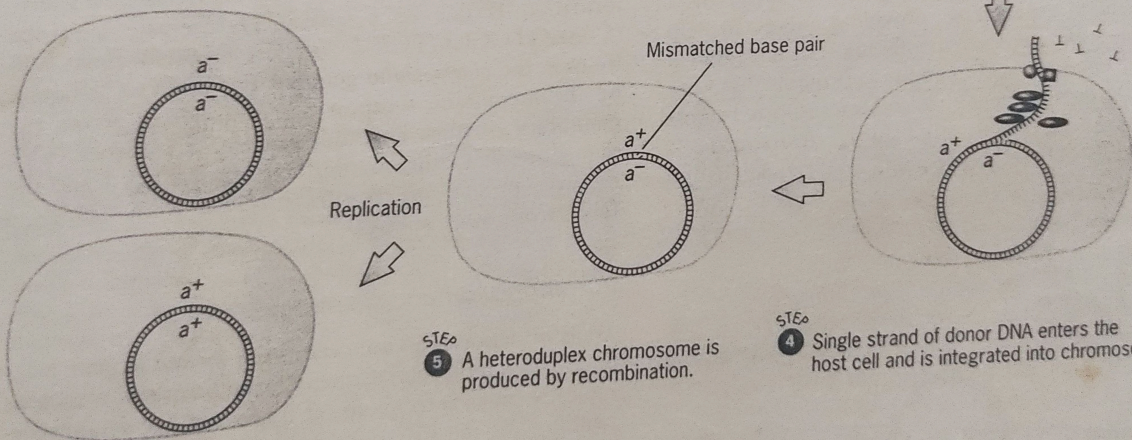
■ **FIGURE 8.8** The three types of gene transfer in bacteria.



1 Large donor DNA is bound to cell surface.

2 Nuclease nicks and degrades one strand of donor DNA as the other strand is transported into the cell.

3 Competence-induced proteins bind to single-stranded donor fragments.



6 Replication of the recombinant heteroduplex chromosome produces one transformed cell (a^+) and one nontransformed cell (a^-).

5 A heteroduplex chromosome is produced by recombination.

4 Single strand of donor DNA enters the host cell and is integrated into chromosome.

Figure 17.7 The mechanism of transformation.

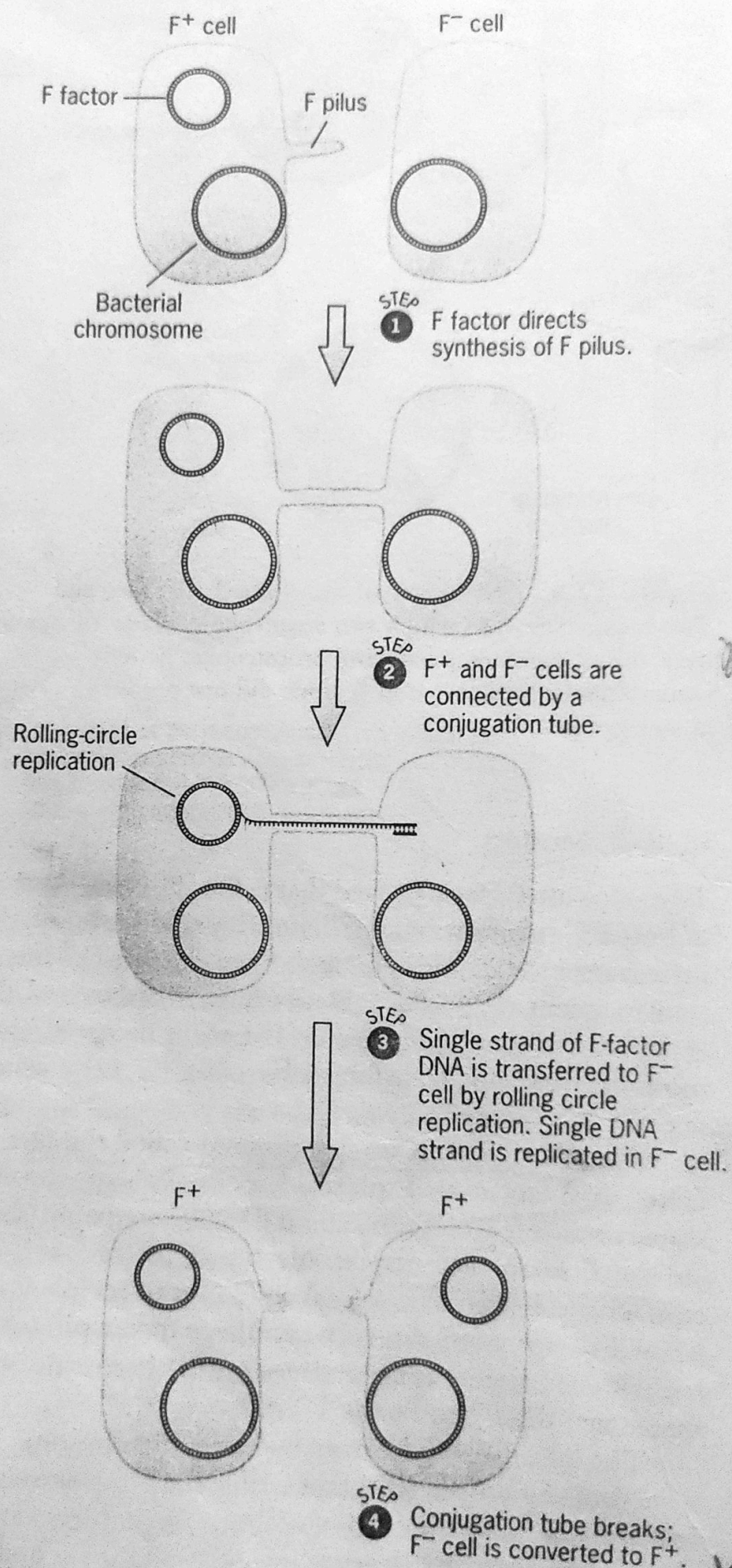


Figure 17.9 $F^+ \times F^-$ conjugation.

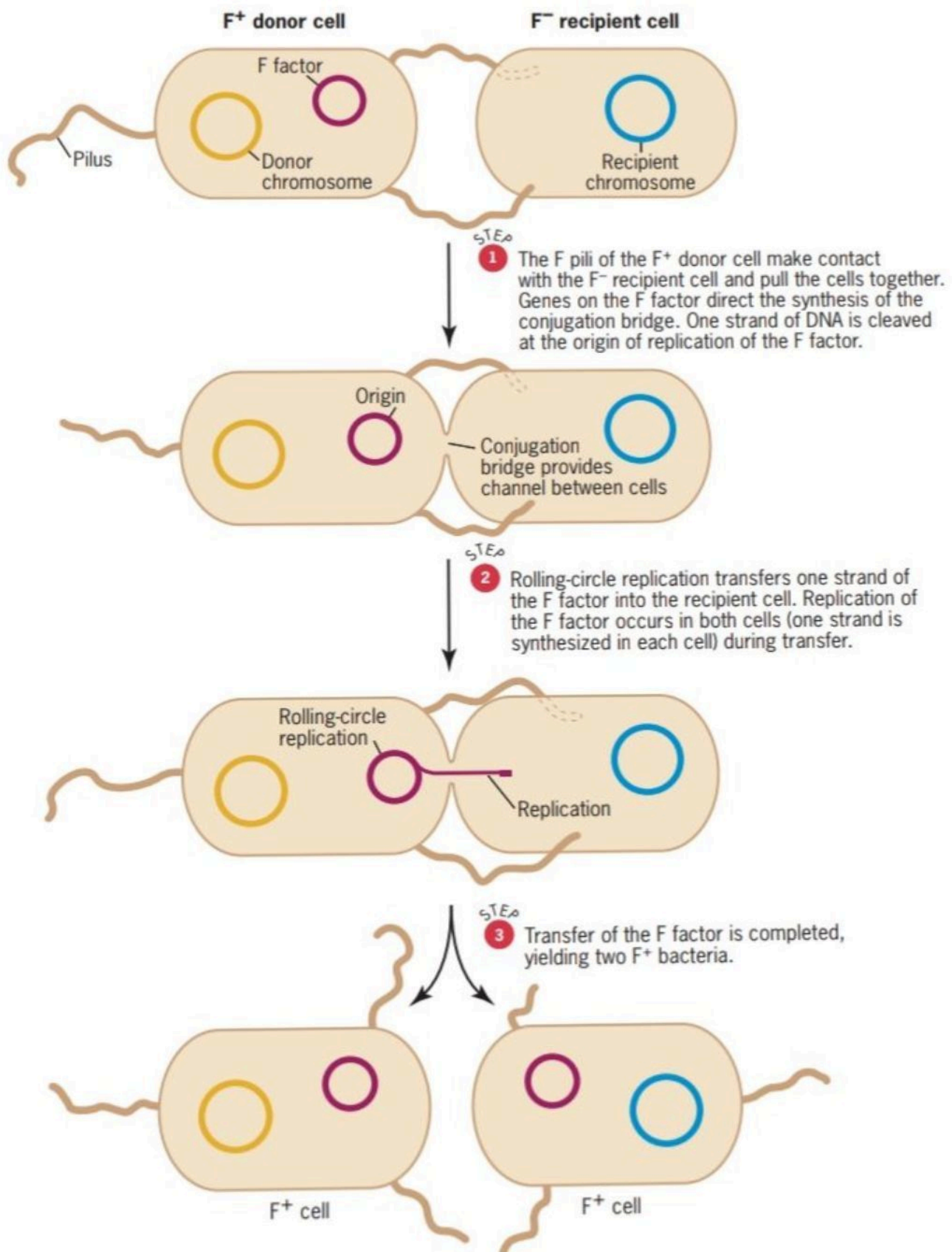


FIGURE 8.16 Mating between an F⁺ cell and an F⁻ cell. The F factor of the donor cell is replicated during transfer from an F⁺ cell to an F⁻ cell. When the process is complete, each cell has a copy of the F factor.

Hfr H donor cells would be killed by the not grow without threonine and leucine. combinants were then transferred (see tes containing different selective media kers were present. The series of plates

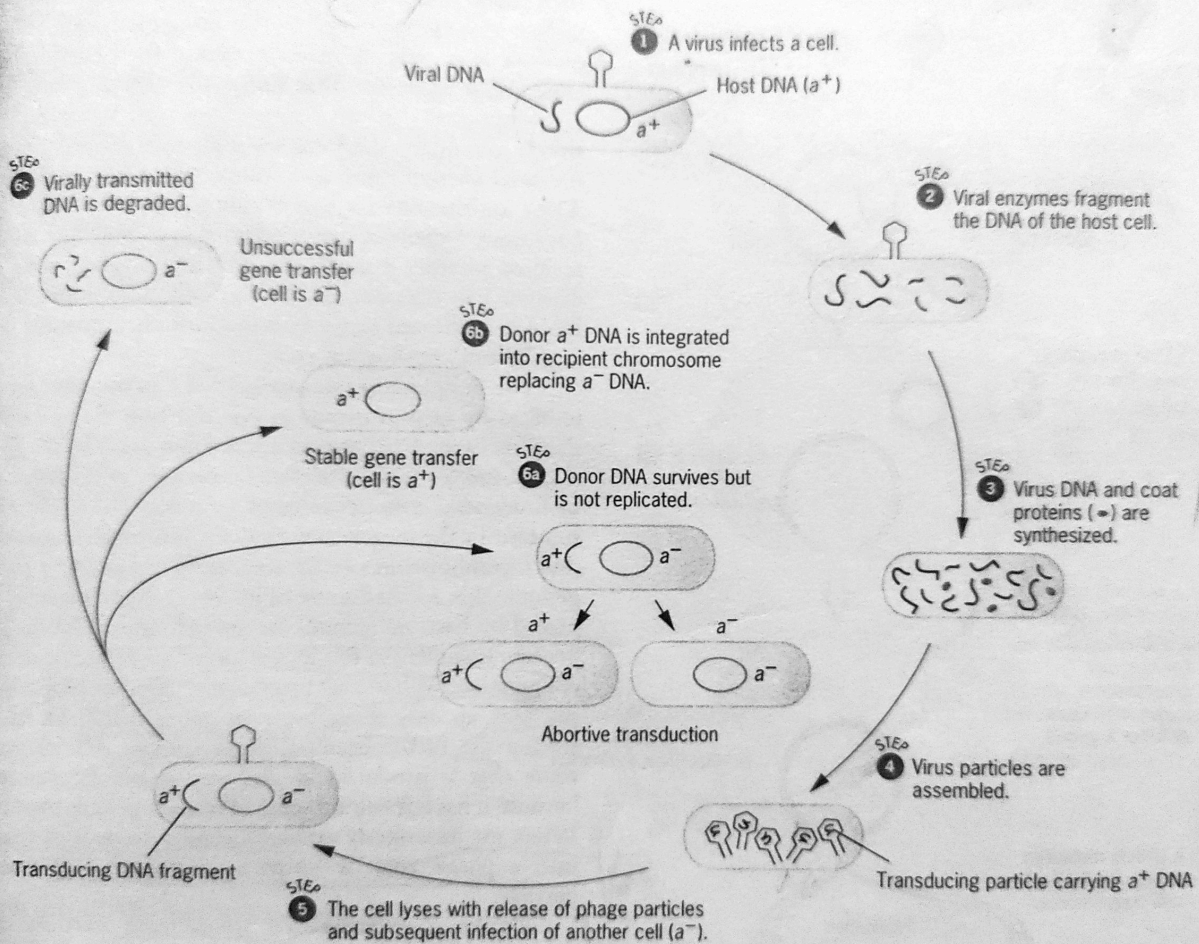


Figure 17.17 The formation of generalized transducing viruses and the subsequent transduction of recipient bacteria.

Chapter 8 The Genetics of Bacteria and Their Viruses

The F factor in *E. coli*: F^- , F^+ , and Hfr . (a) An F^- cell has no F factor. (b) An F^+ cell contains an F factor that replicates independently of the chromosome. (c) An Hfr cell contains an F factor that is integrated into the chromosome.

