



**Figure 6.1**


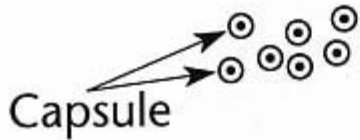


	Bacterial type	Effect in mouse	Bacteria recovered
A	Live type R 	Nonpathogenic	None
B	Live type S 	Pathogenic	Live type S
C	Heat-killed type S 	Nonpathogenic	None
D	Mixture of live type R and heat-killed type S 	Pathogenic	Live type S

Figure 6.2

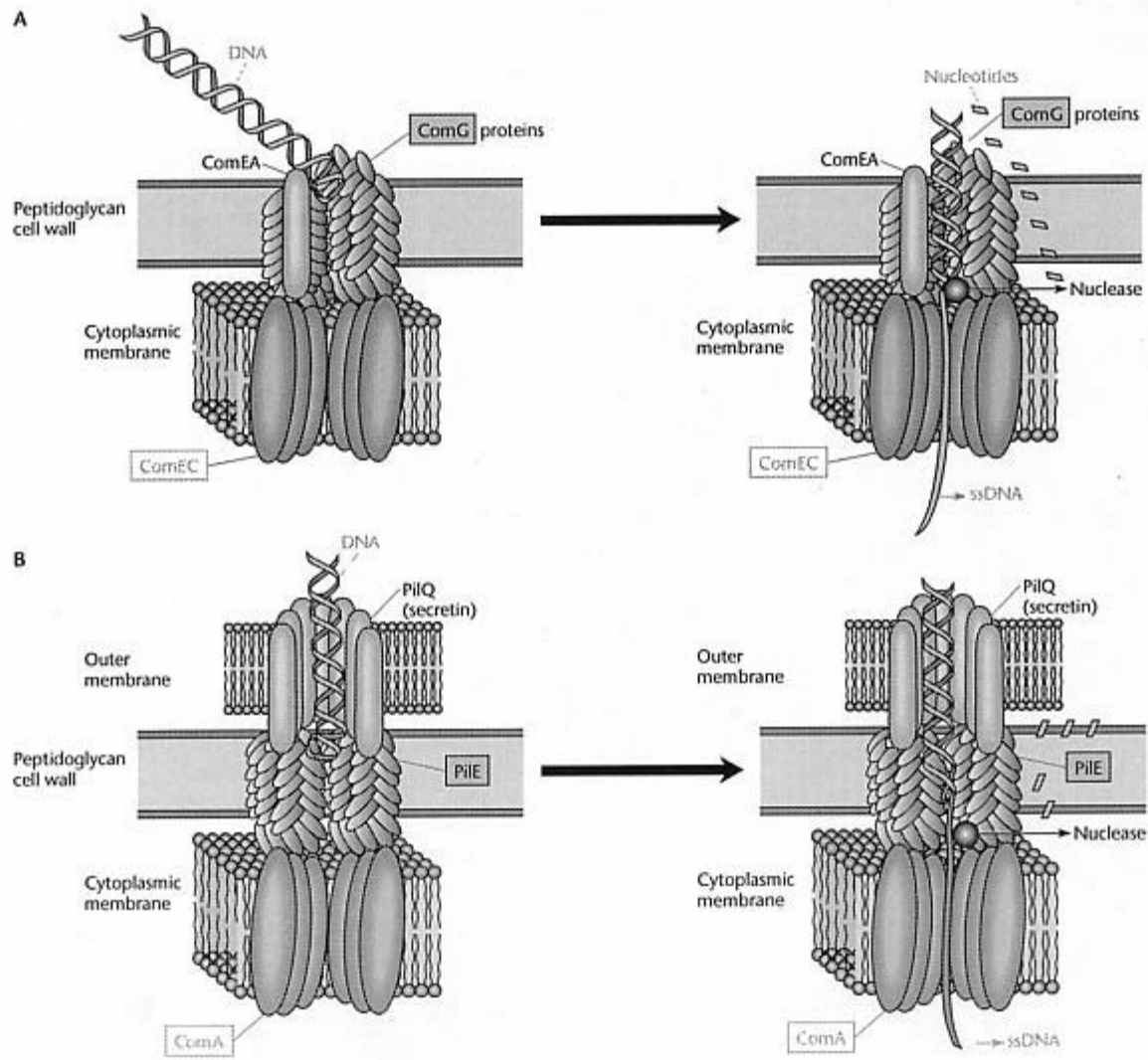
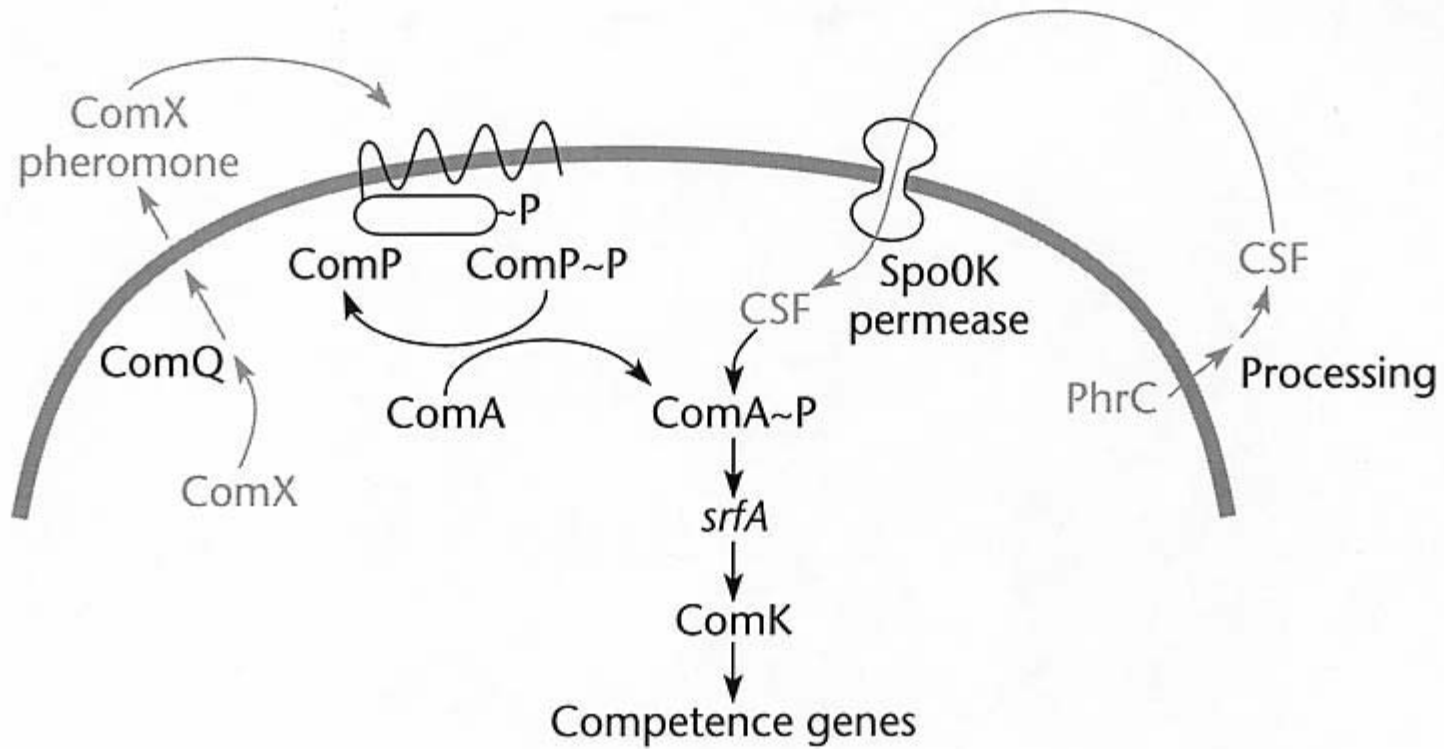


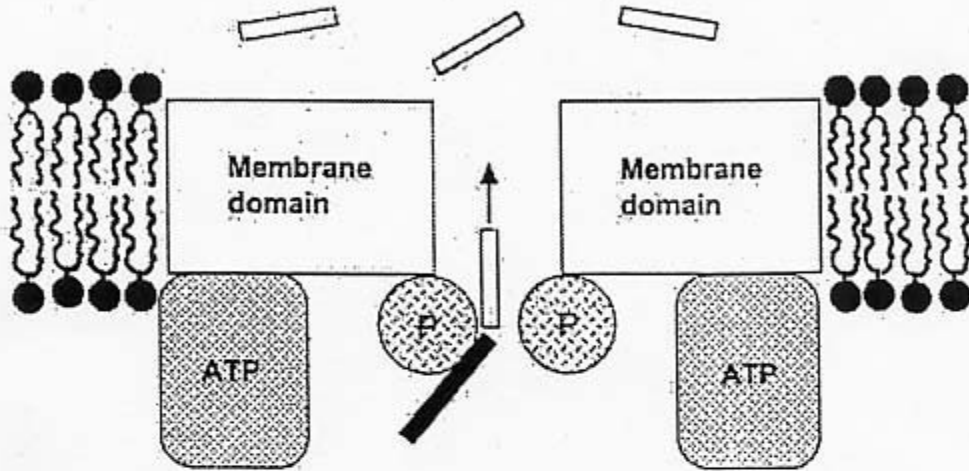
TABLE 1 PSTC proteins required for competence, pullulanase secretion and pilus formation

Class	Competence proteins						
	<i>B. s</i> <sup>a</sup>	Strep. <sup>b</sup>	<i>N. g.</i> <sup>c</sup>	<i>H. i.</i> <sup>d</sup>	<i>A. c.</i> <sup>e</sup>	Pul <sup>f</sup>	Pil <sup>g</sup>
1	ComGA (1)	CglA (107) CilD1 (16) ComYA (92)	PilT (146)	PilB (54)	N. D.	PulE (111)	PilB (104)
2	ComGB (1)	CglB (107) CilD2 (16) ComYB (92)	PilG (141)	PilC (54)	N. D.	PulF (111)	PilC (104)
3	ComGC (1) ComGD (1) ComGE (1) ComGG (1)	CgC (107) CglD (107) ComYC (92)	PilE (128)	PilA (54)	ComP (110)	PulG (119) PulH (119) PulI (119) PulJ (119)	XcpT (8, 105) XcpU (8, 105) XcpV (8, 105) XcpW (8, 105)
4	ComC (98)	CilC (16) ComYD (92)	PilD (47)	ComE (140)	N. D.	PulO (114)	PilD (104)
5	None	N. D.	PilQ (32)	ComE (140)		PulD (58)	PilQ (93)

<sup>a</sup>*B. subtilis*.<sup>b</sup>Streptococci.<sup>c</sup>*N. gonorrhoeae*.<sup>d</sup>*H. influenzae*.<sup>e</sup>*A. calcoaceticus*.<sup>f</sup>Pullulanase secretion representing class 2 secretion.<sup>g</sup>Pilus assembly in *P. aeruginosa* representing type 4 pilus assembly. <sup>†</sup>Annu. Rev. Micro. 53, 217 (99)PSTC proteins = pilus/secretion/twitching-  
motility/competence(Gm) <sup>†</sup> *Helicobacter pylori* - DNA translocation similar to type IV secretion/expi.

Figure 6.3





ComC  
(CSP)


  
 MKNTVKLEQFVALKEKDLQKIKGGEMRLSKFFRDFILQRKK



Figure 1. Model depicting processing and secretion of the competence stimulating peptide (CSP) by its dedicated ABC-exporter, ComA. The ABC-exporter operates as a dimer, and consists of three functional domains; an ATP-hydrolysing domain (ATP) providing energy for transport, a membrane domain that mediates translocation of the mature peptide across the membrane (open rectangle), and a proteolytic domain (P) that recognizes the double-glycine leader peptide (solid rectangle) and processes it as indicated by the arrow. Amino acid residues in the GG-leader of ComC that are conserved in most leaders of the GG-type are indicated in bold.

Front. Microbiol. 7, 1795 (2017) (S. pneumoniae)

ComA - leader peptidase (N term 150 aa) & Walker H & B motifs for ATP binding

ComB - accessory protein

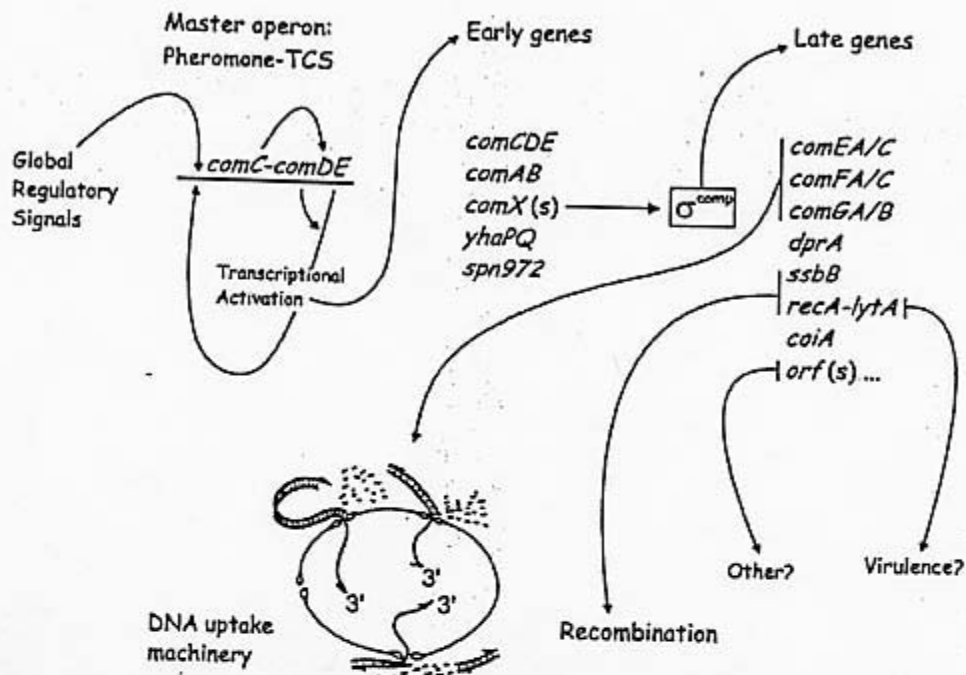
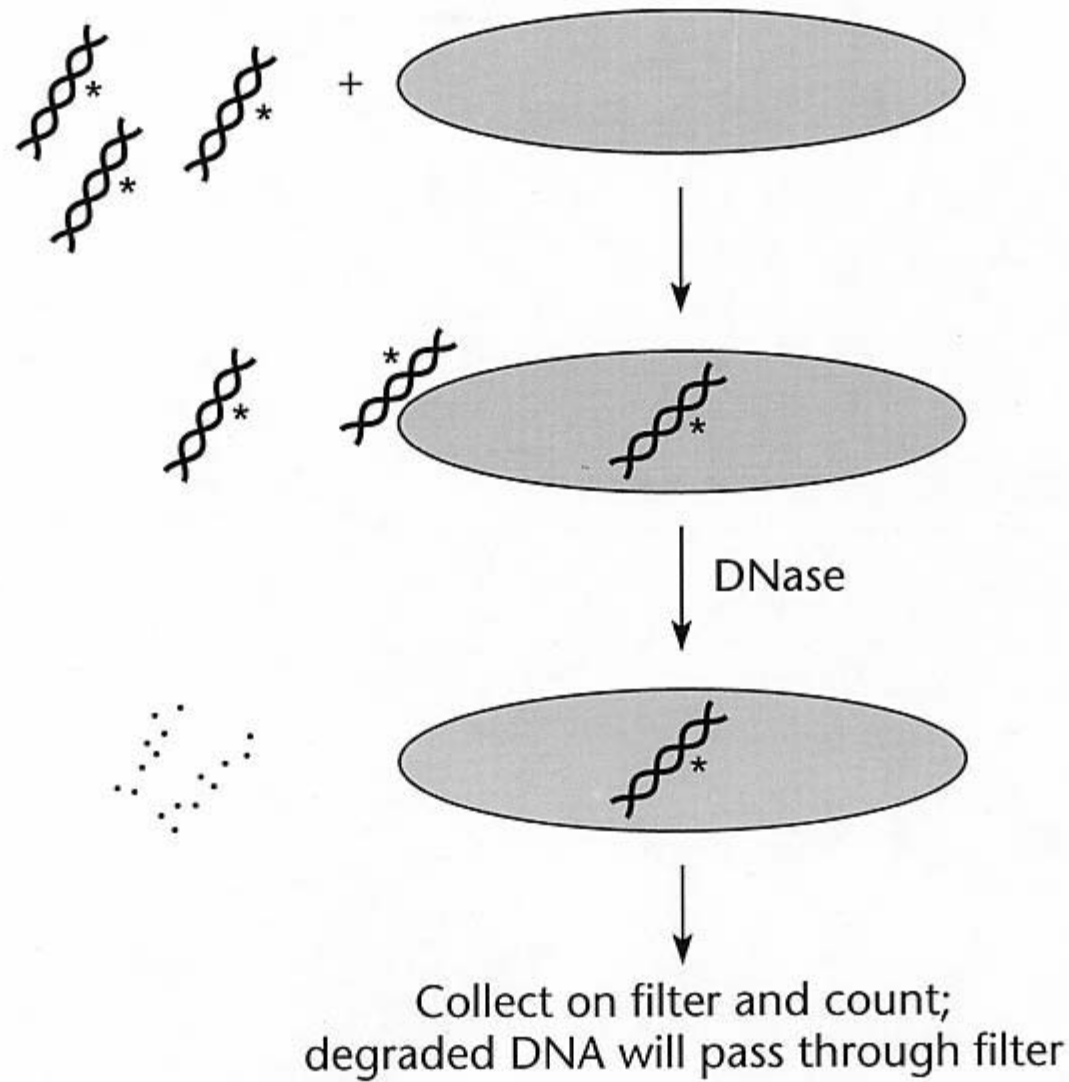


Figure 3. Pathway of competence regulation in *S. pneumoniae*. The pheromone precursor, ComC, is processed and exported by ComAB. The extracellular pheromone is detected by its specific receptor, the HK ComD, which, in turn, phosphorylates its cognate RR ComE. ComE~P drives expression of the early *com* genes, including *comX*. ComX ( $\sigma^H$ ) polymerase holoenzyme activates the transcription of late *com* genes. The latter encode the DNA uptake machinery (i.e. ComEFGs), recombination proteins (e.g. RecA), virulence proteins (e.g. LytA) and proteins of unknown functions. The DNA transport apparatus of *S. pneumoniae* (60) is likely to be very similar to that of *B. subtilis* (15). See text for explanations.

Frontiers Biosci 7, 129P (2002)



**Figure 6.4**





**Figure 6.5**

*Haemophilus influenzae* 5' AAGTGCGGTCA 3'

*Neisseria gonorrhoeae* 5' GCCGTCTCAA 3'



Figure 6.6

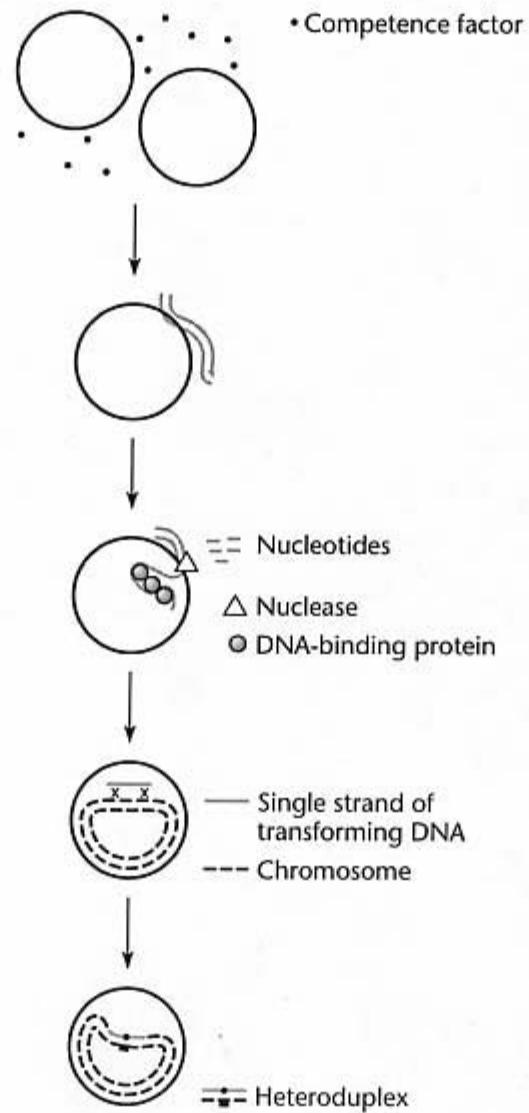


Figure 6.7

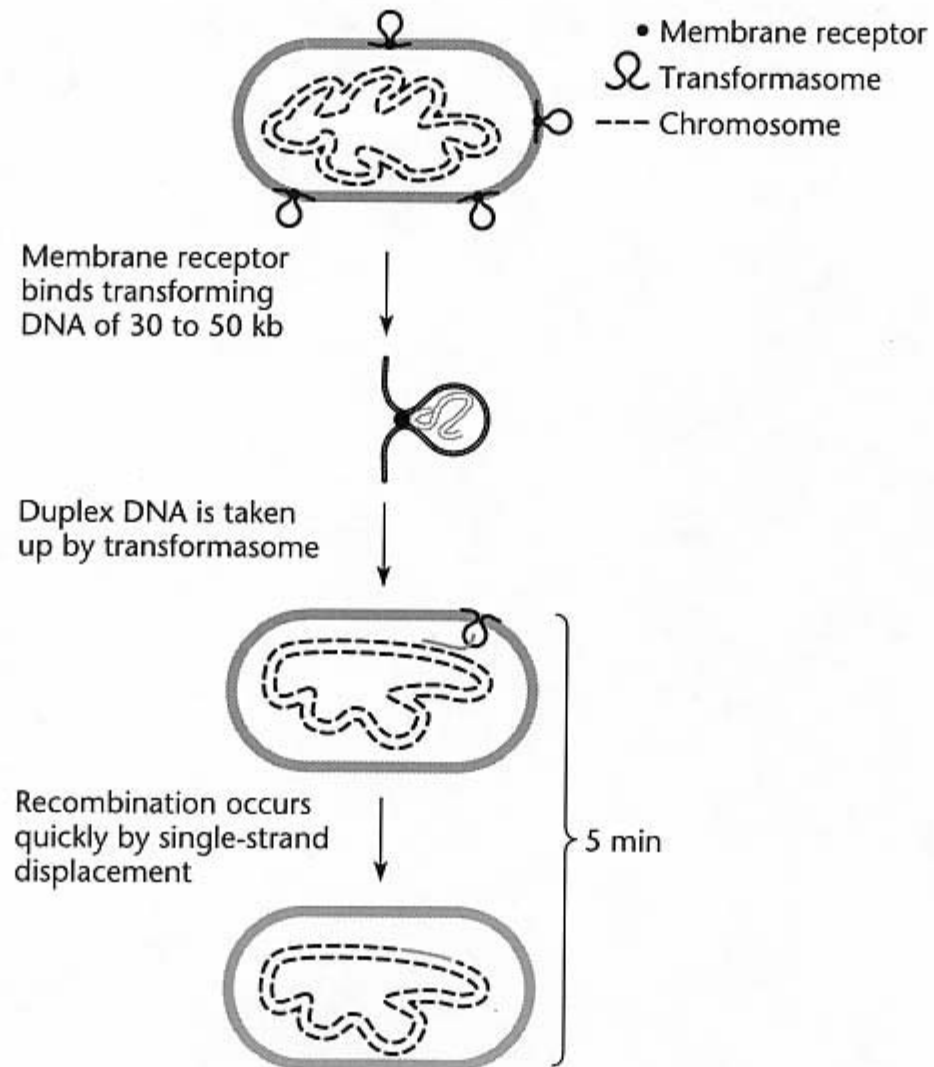


Figure 6.8

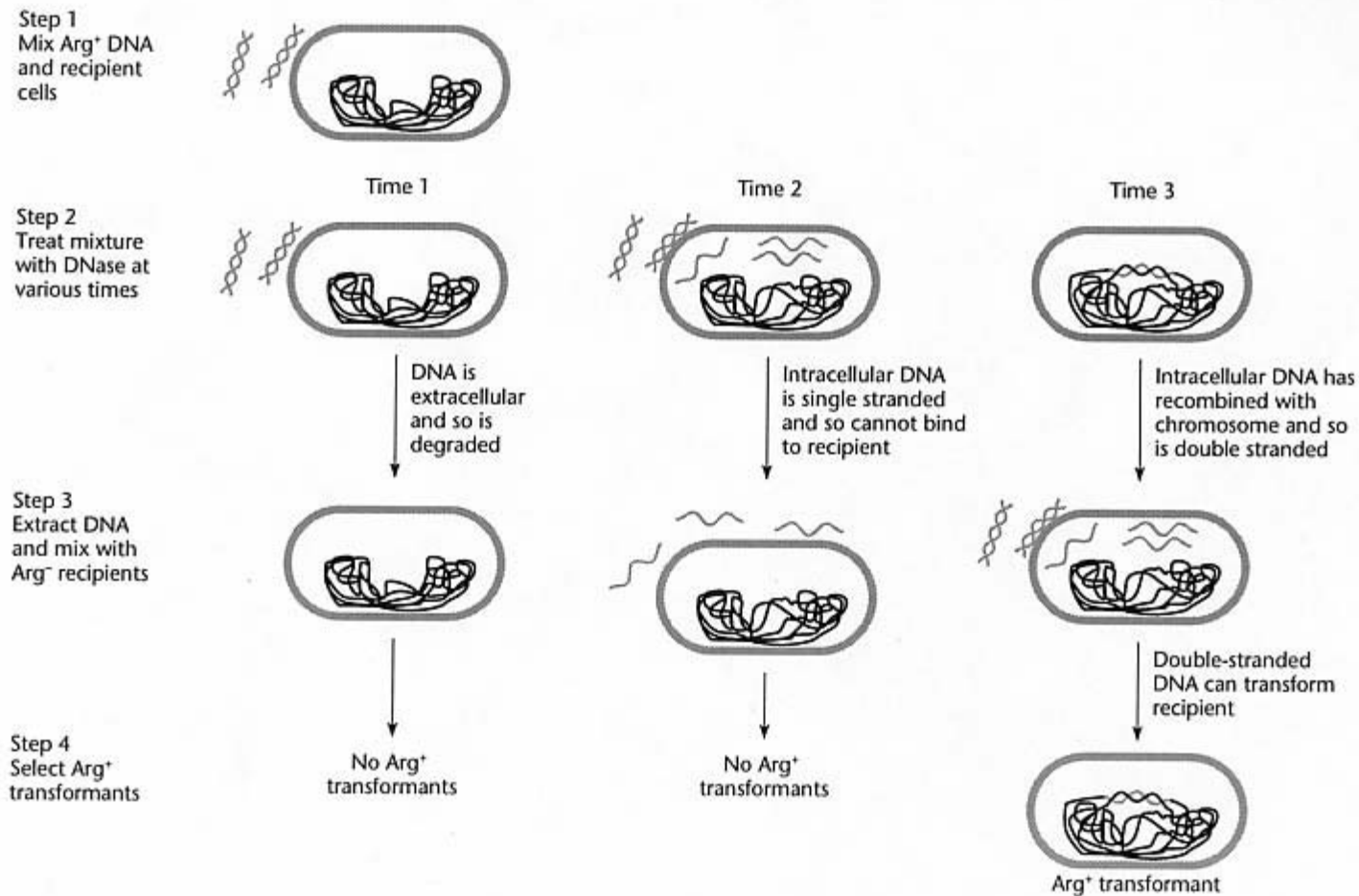


Figure 6.9

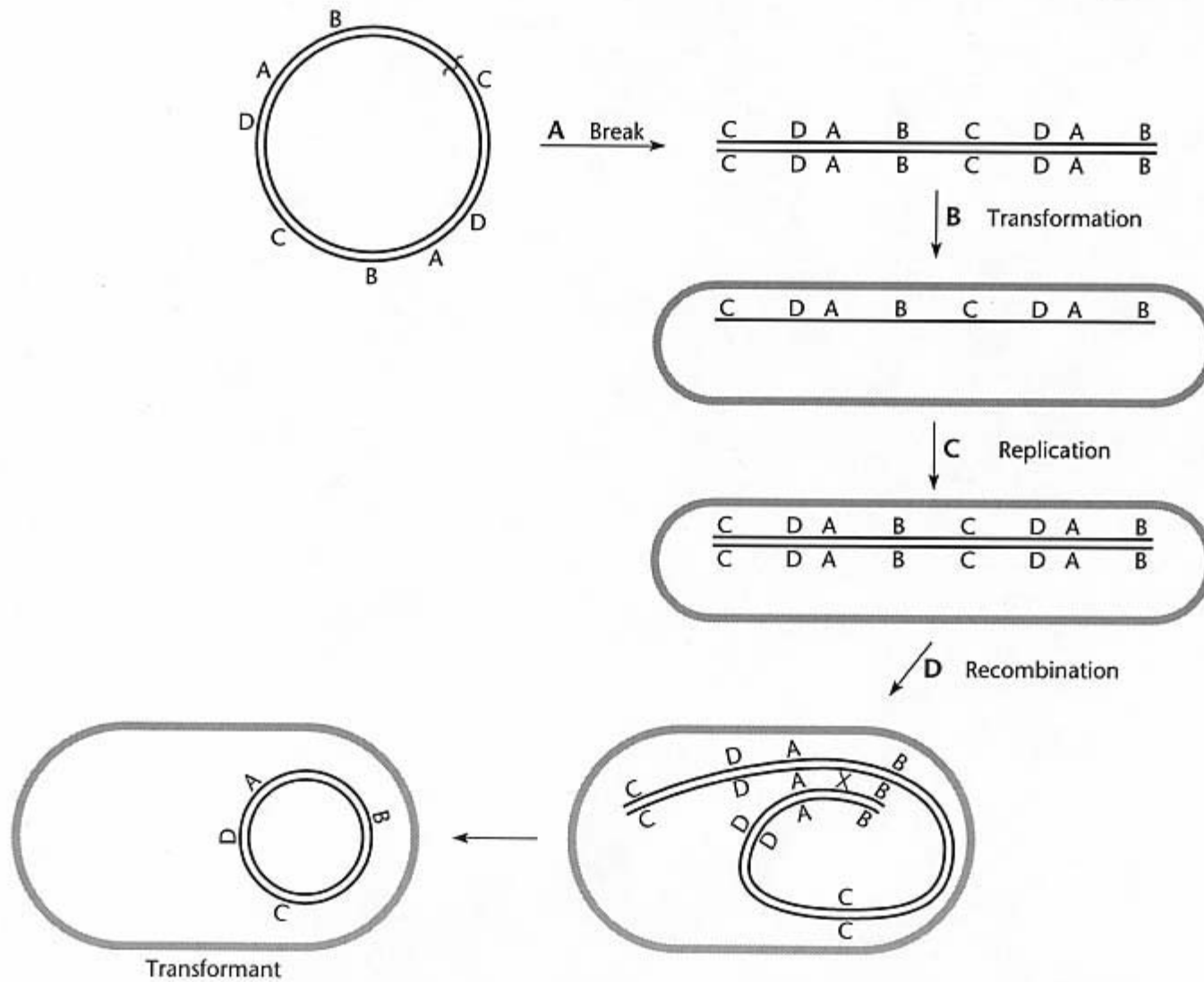


Figure 6.10

