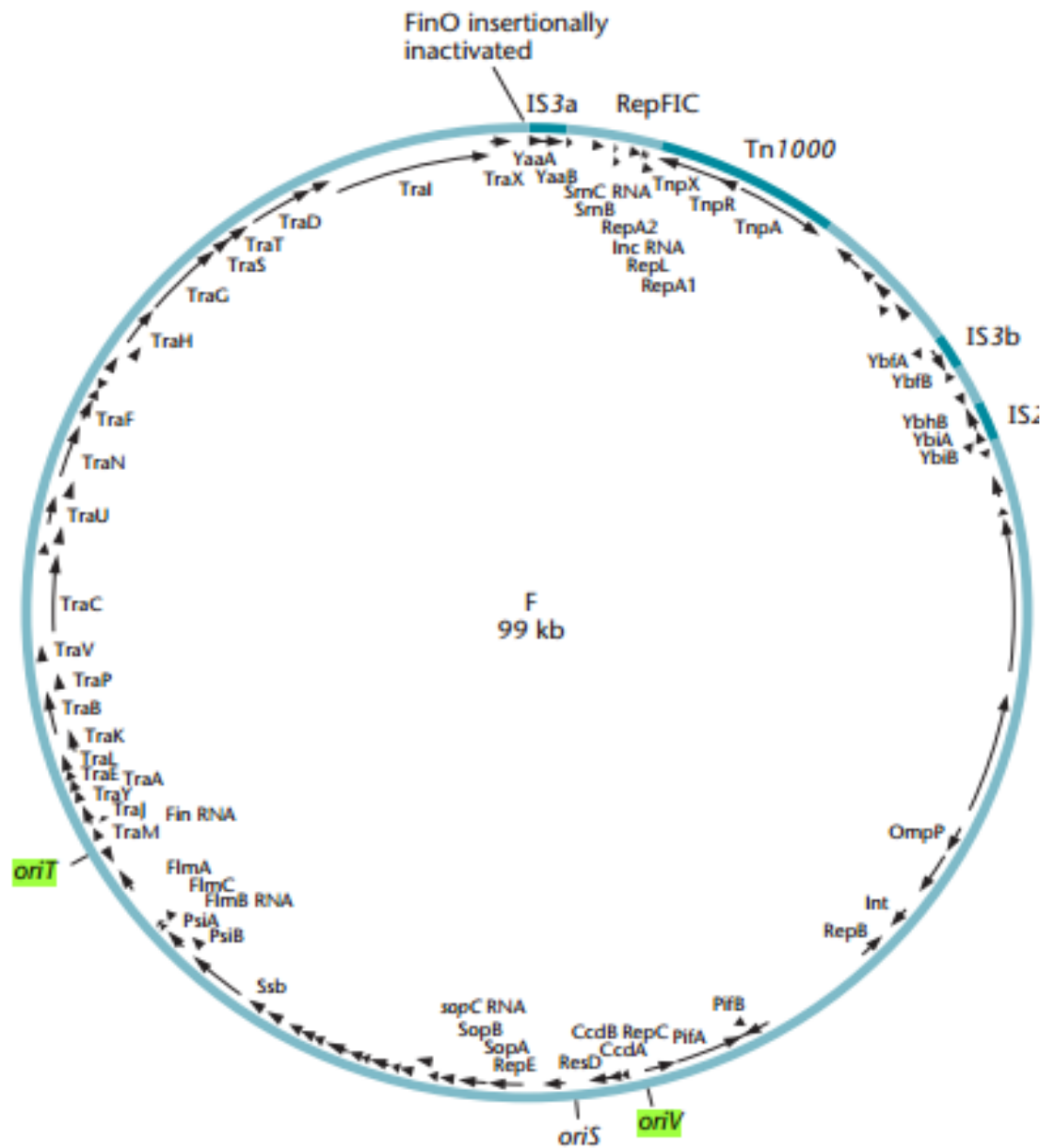


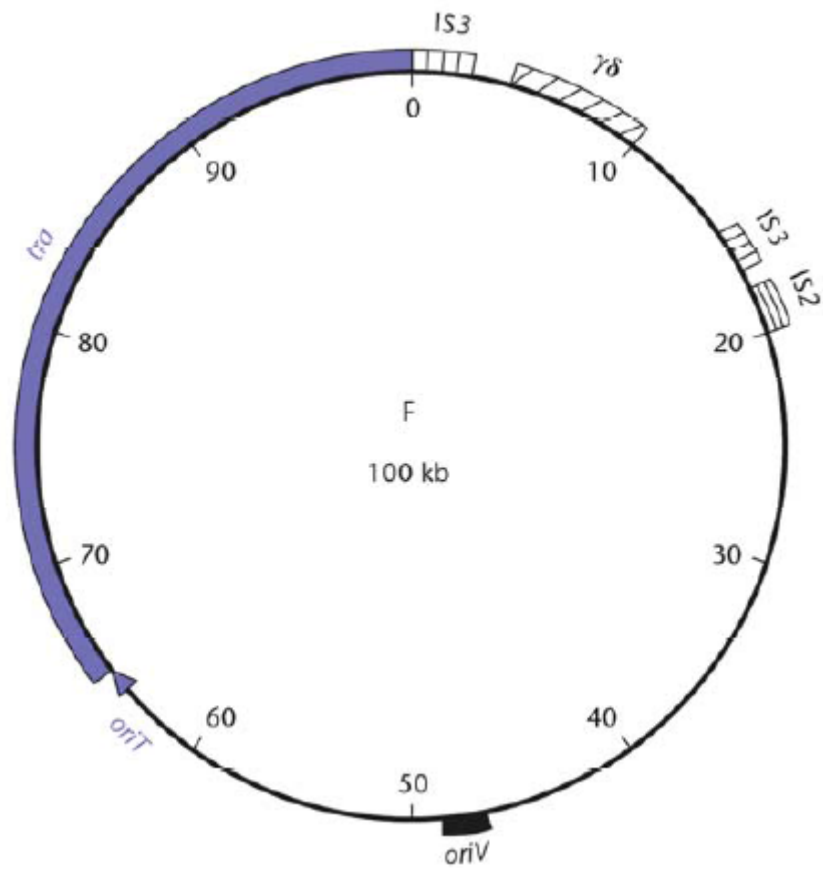
# Conjugation

By: Dr. Marashi

# introduction

- Lederburg & tatum
- *Transconjugant*
- *self-transmissible # mobilizable plasmid*
- *Tra gene*
- *promiscuous plasmids (several host)*
  - *pKM101*
- *Transposon and R plasmids*



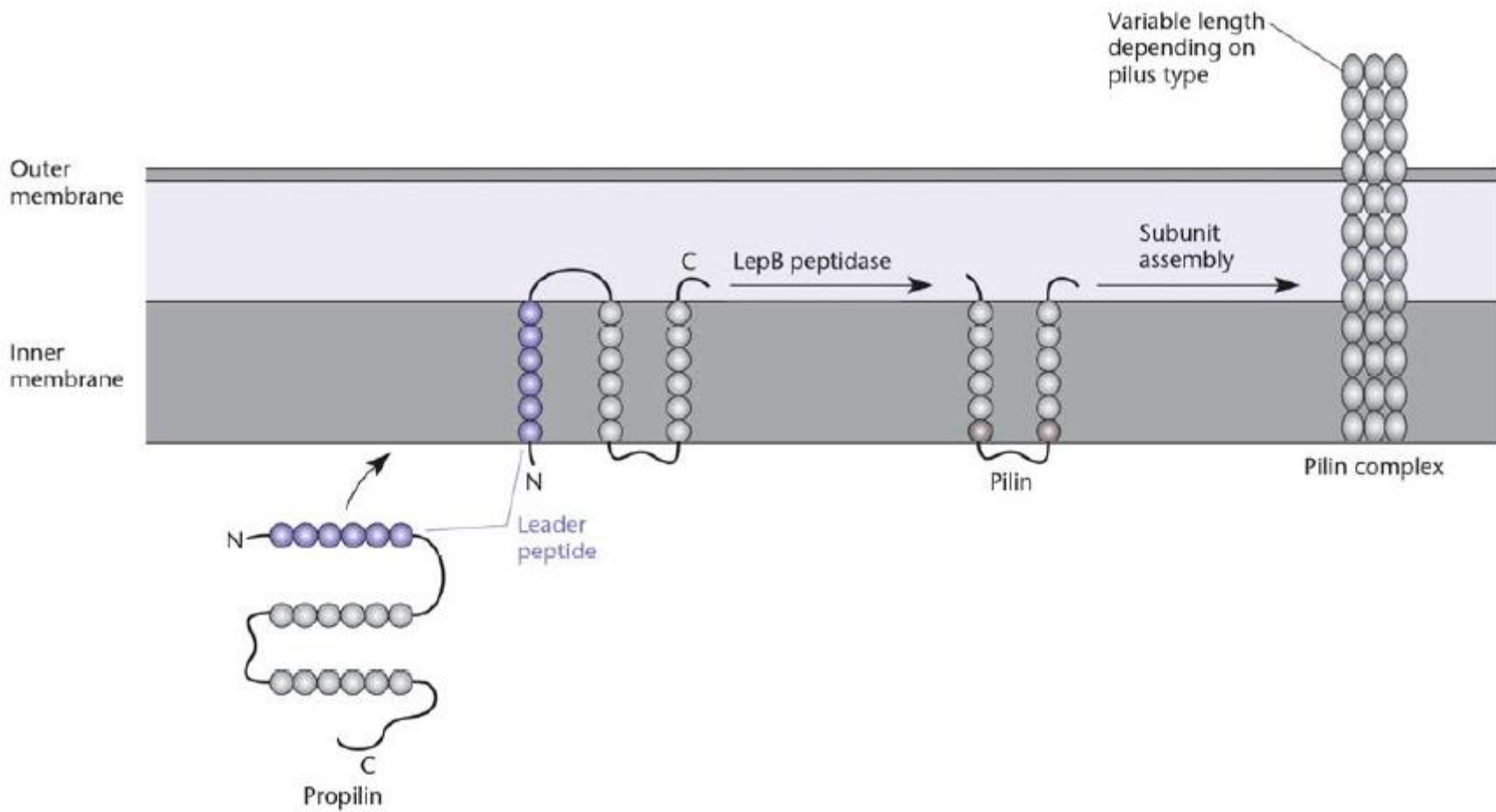


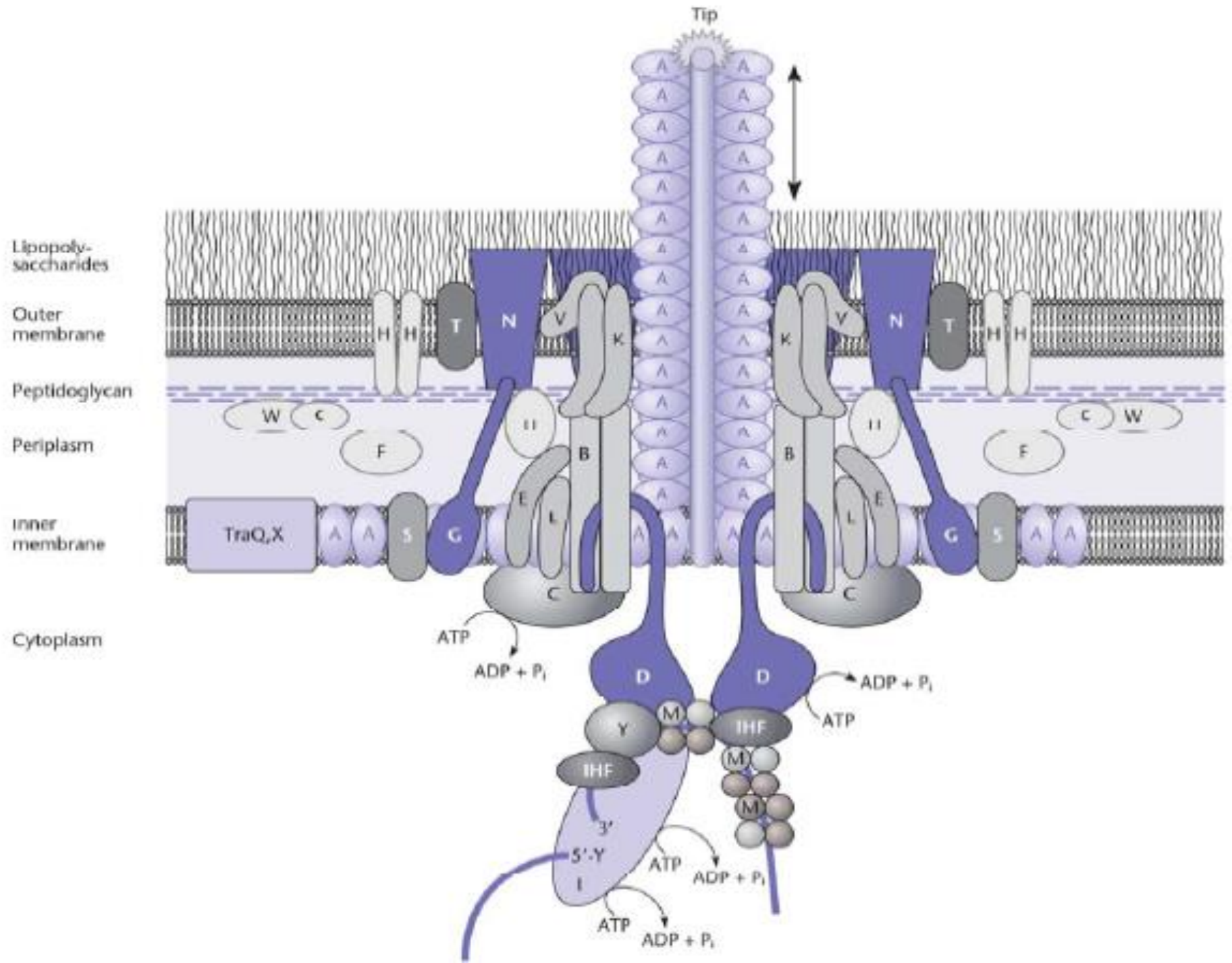
**TABLE 5.1****Some F-plasmid genes and sites**

Symbol	Function
<i>ccdAB</i>	Inhibition of host cell division
<i>incBCE</i>	Incompatibility
<i>oriT</i>	Site of initiation of conjugal DNA transfer
<i>oriV</i>	Origin of bidirectional replication
<i>sopAB</i>	Partitioning
<i>traABCEFGHKLQUVWX</i>	Pilus biosynthesis, assembly
<i>traGN</i>	Mating-pair stabilization
<i>traD</i>	Coupling protein
<i>traI</i>	Relaxase
<i>traYM</i>	Accessories for relaxosome
<i>traJ, finOP</i>	Regulation of transfer
<i>traST</i>	Entry exclusion

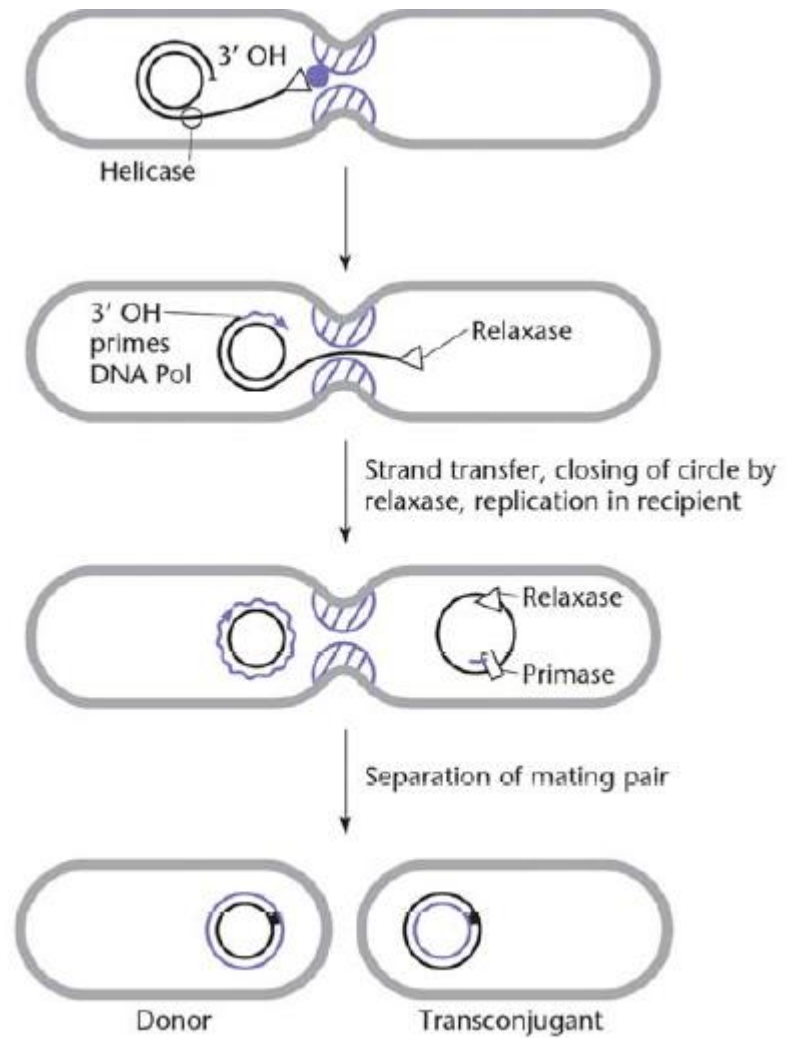
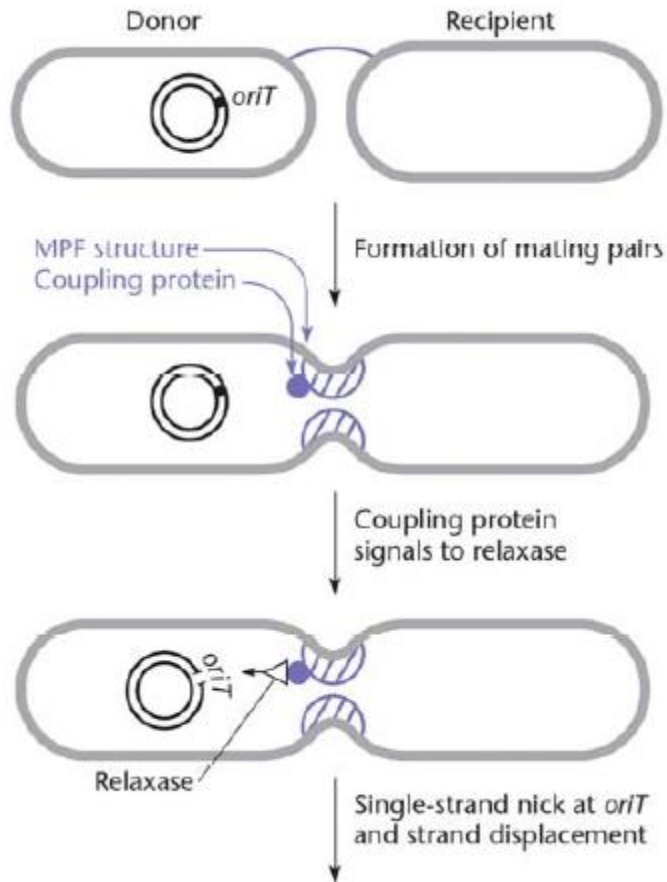
# Conjugation

- Tra genes
  - *Dtr (mob) genes (DNA transfer and replication)*
    - *Relaxase (Tra I) (ori T)*
    - *Relaxosome compartment (unknown functions)*
  - *MPF (Mating Pair formation)*
    - *IV secretory system*
- *Coupling protein (Tra D) Dtr & MPF relationship*



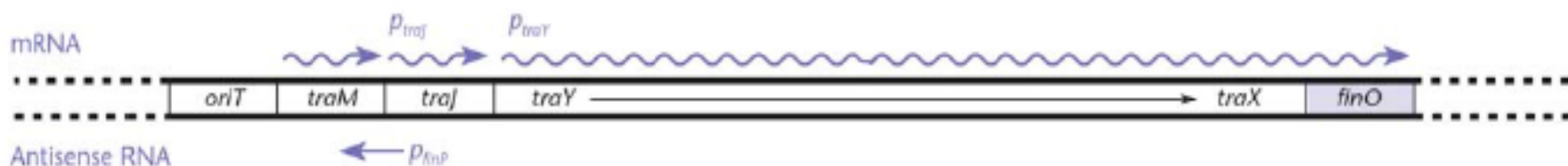






**Figure 5.7** Fertility inhibition of the  $\Gamma$  plasmid. Only the relevant *tra* genes discussed in the text are shown. (A) Genetic organization of the *tra* region. (B) The *traJ* gene product is a transcriptional activator that is required for transcription of the other *tra* genes, *Y-X*, and *finO* from promoter  $p_{traV}$ . (C) Translation of the *traJ* mRNA is blocked by hybridization of an antisense RNA, FinP, which is transcribed in the same region from the complementary strand. A protein, FinO, stabilizes the FinP RNA. Details are given in the text.

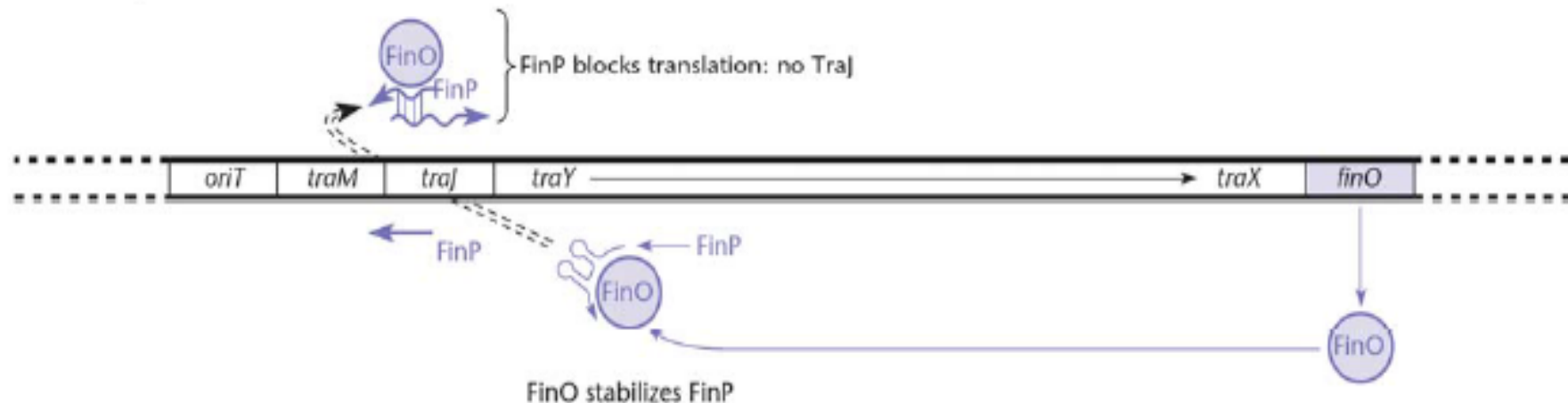
**A** Genetic organization of *tra* region

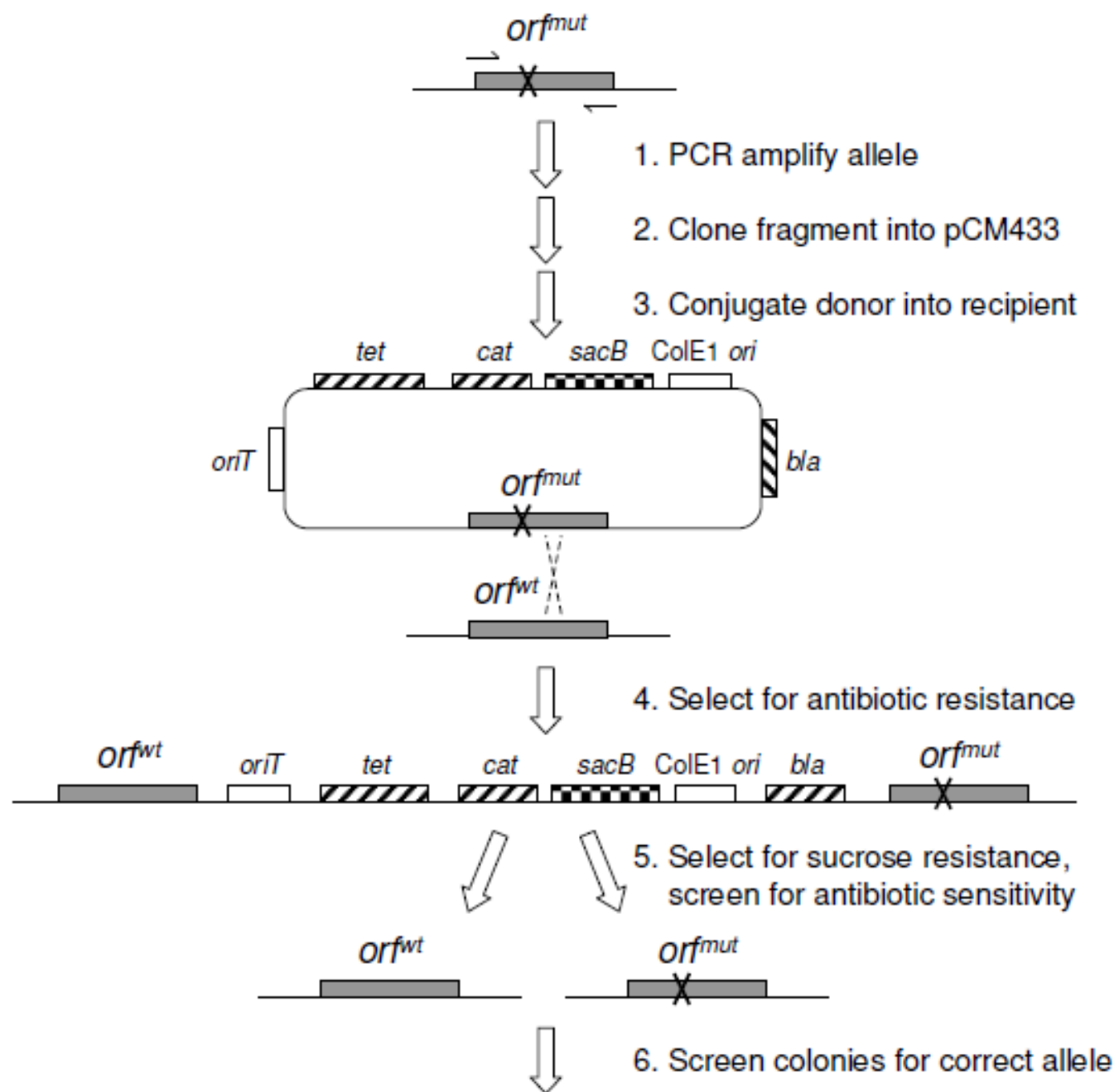


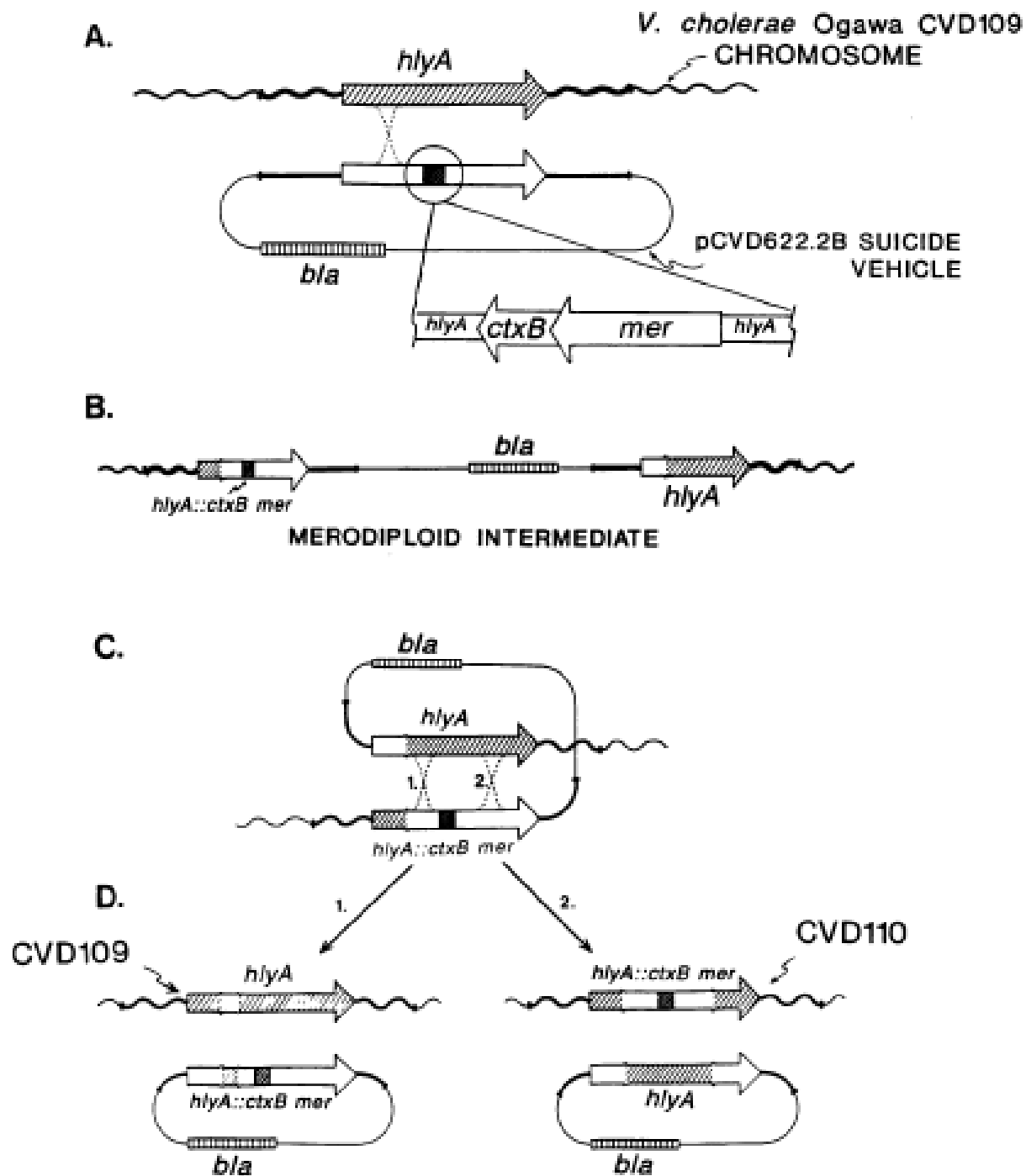
**B** Immediately after entry into cell



**C** After plasmid establishment







# Conjugation

- ***triparental mating***
  - *Self-mobilize / mobilized plasmid/ received*
- ***Hfr (High ferquency recombination)***
  - *IS*

# Questions

- ۱- چگونه شما نشان می‌دهید که تنها یک رشته *DNA* پلاسمید در طول انتقال پلاسمید به سلول پذیرنده وارد میشود؟
- ۲- شما کشف کردید که مقاومت به تتراسایکلین از یک سوش باکتری به سوش دیگر منتقل میشود. چگونه شما تعیین میکنید مقاومت به تتراسایکلین از یک پلاسمید خودانتقالی به باکتری انتقال یافته یا از طریق ترانسپوزون کانجوگه منتقل شده است؟