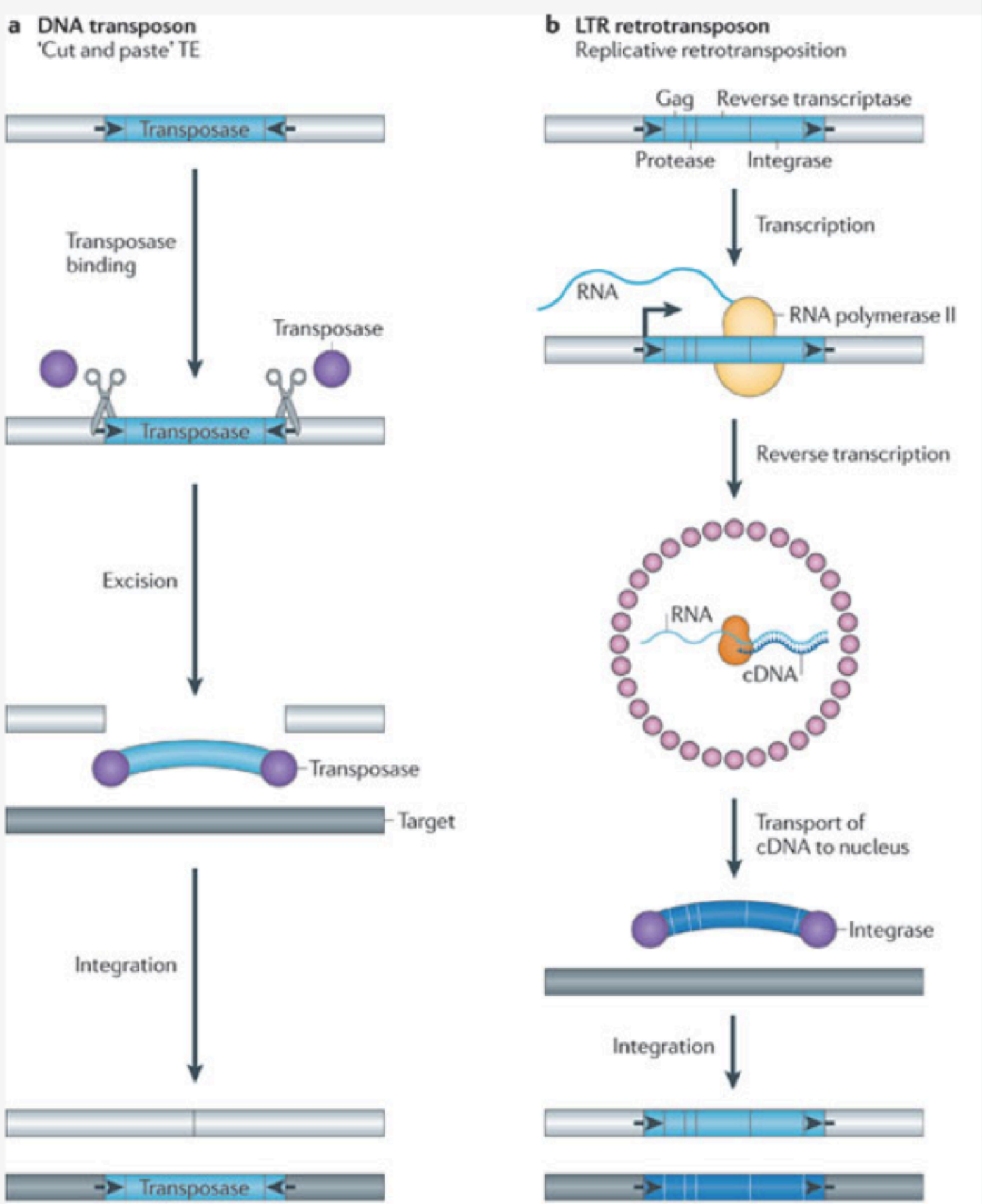
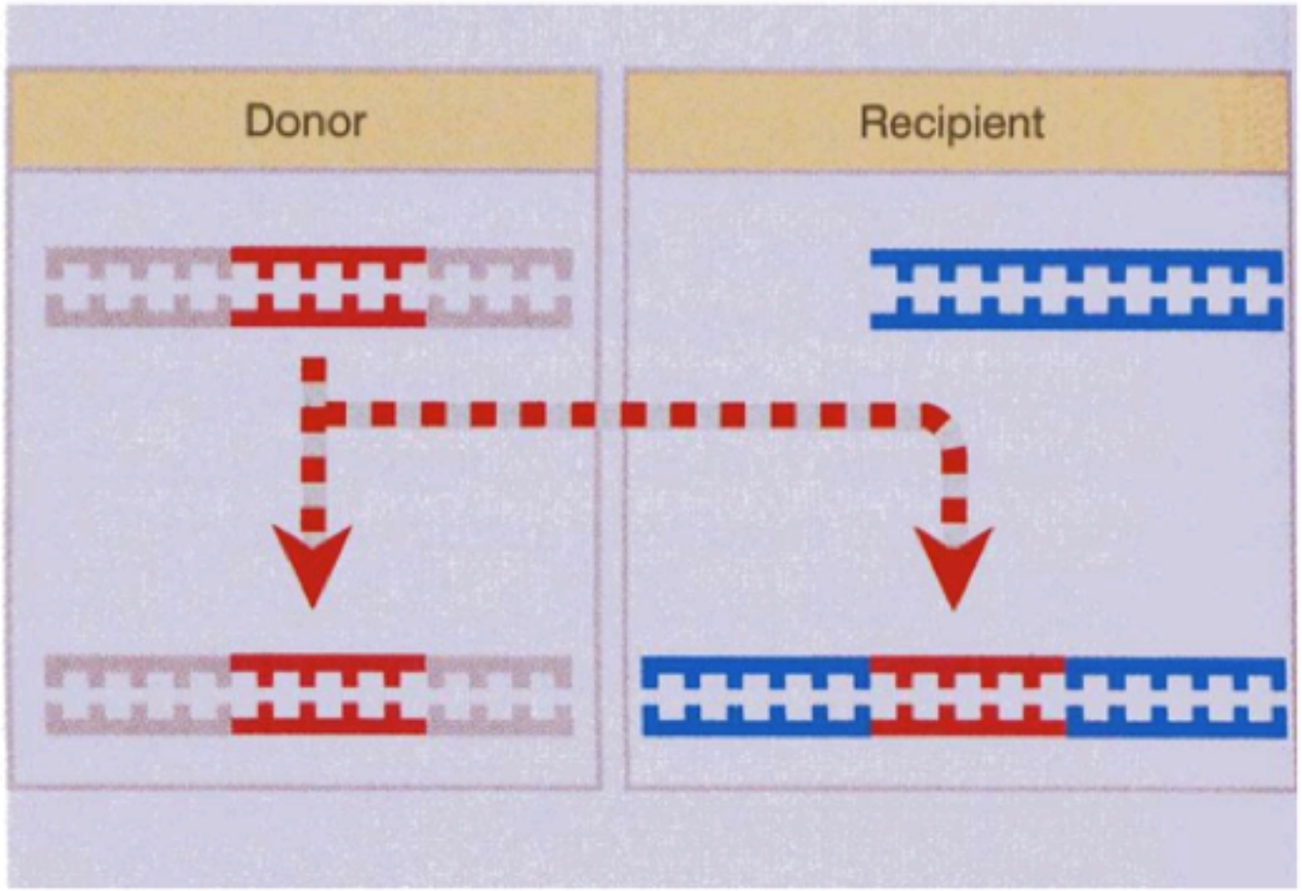
Elementos Transponibles :

- Retrotransposones (usan un intermediario de ARN para generar la copia)

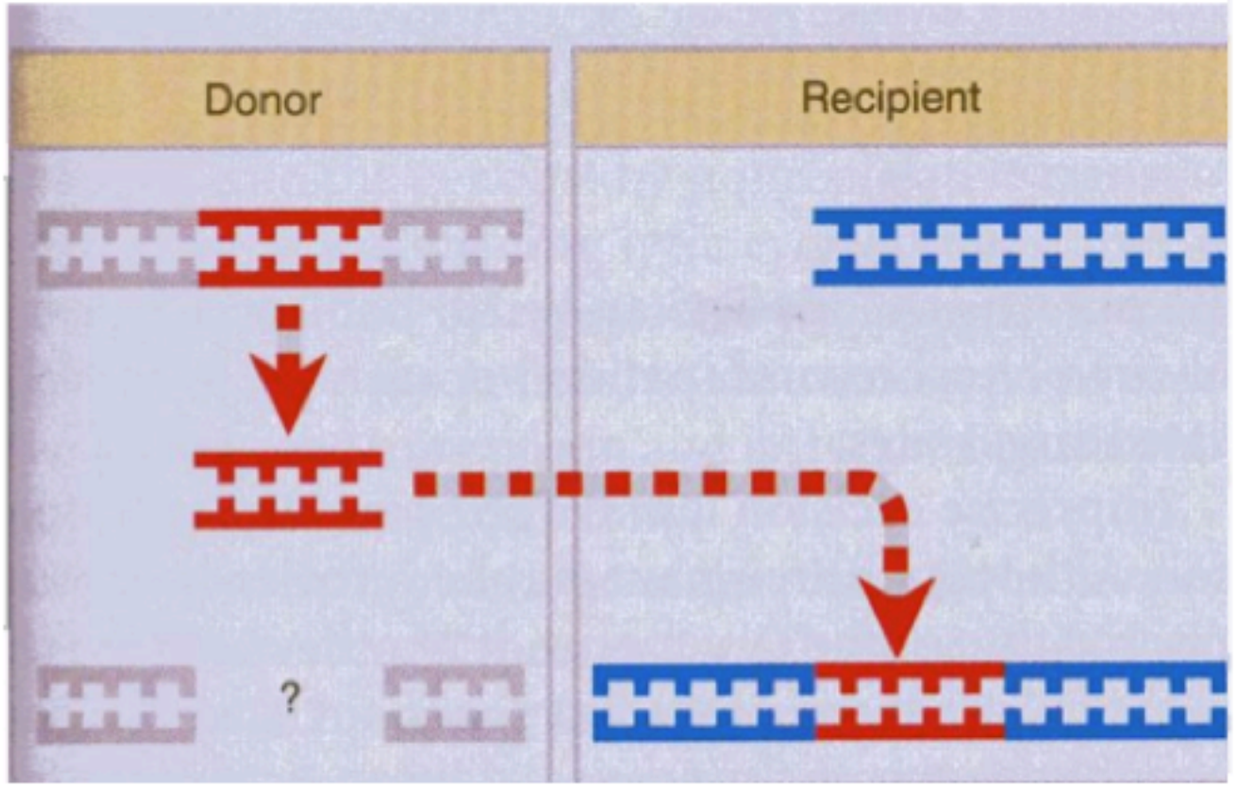
- Transposones de ADN

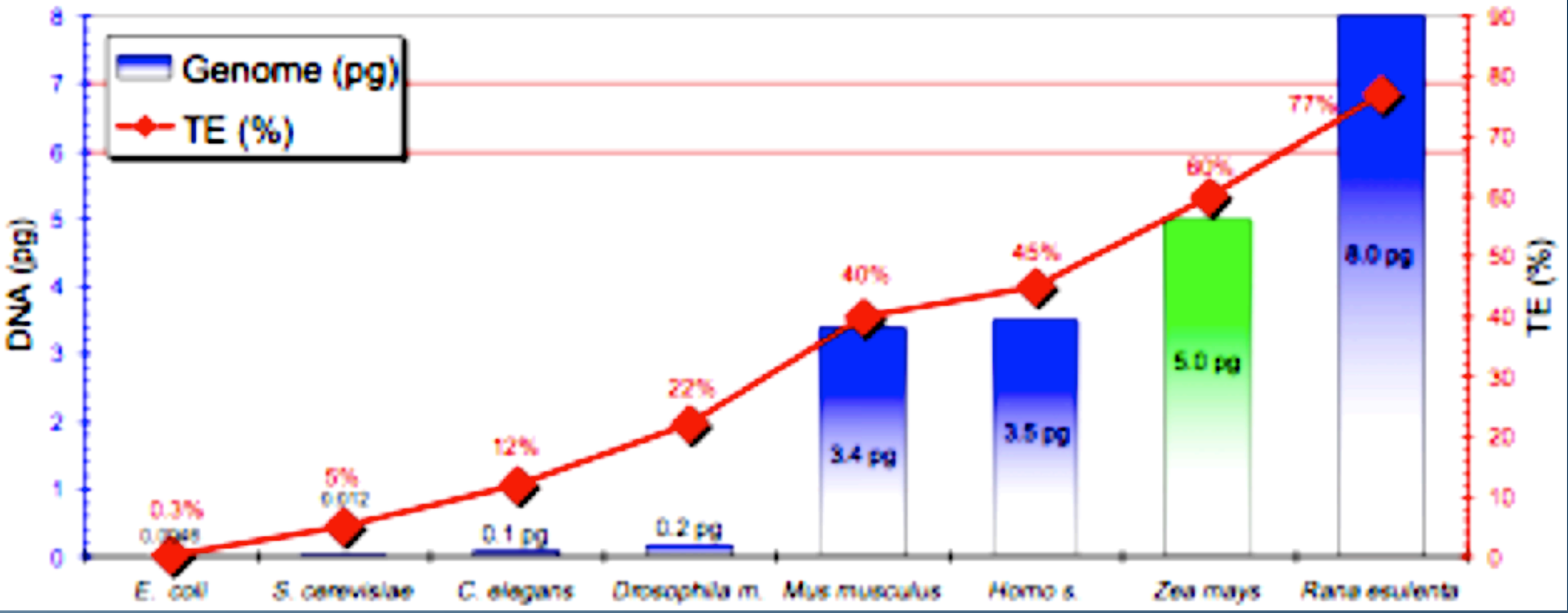

a DNA transposon
'Cut and paste' TE
Transposase
Transposase binding
Transposase
Transposase
Excision
Transposase
Target
Integration
Transposase
b LTR retrotransposon
Replicative retrotransposition
Gag
Reverse transcriptase
Protease
Integrase
Transcription
RNA
RNA polymerase II
Reverse transcription
RNA
cDNA
Transport of cDNA to nucleus
Integrase
Integration



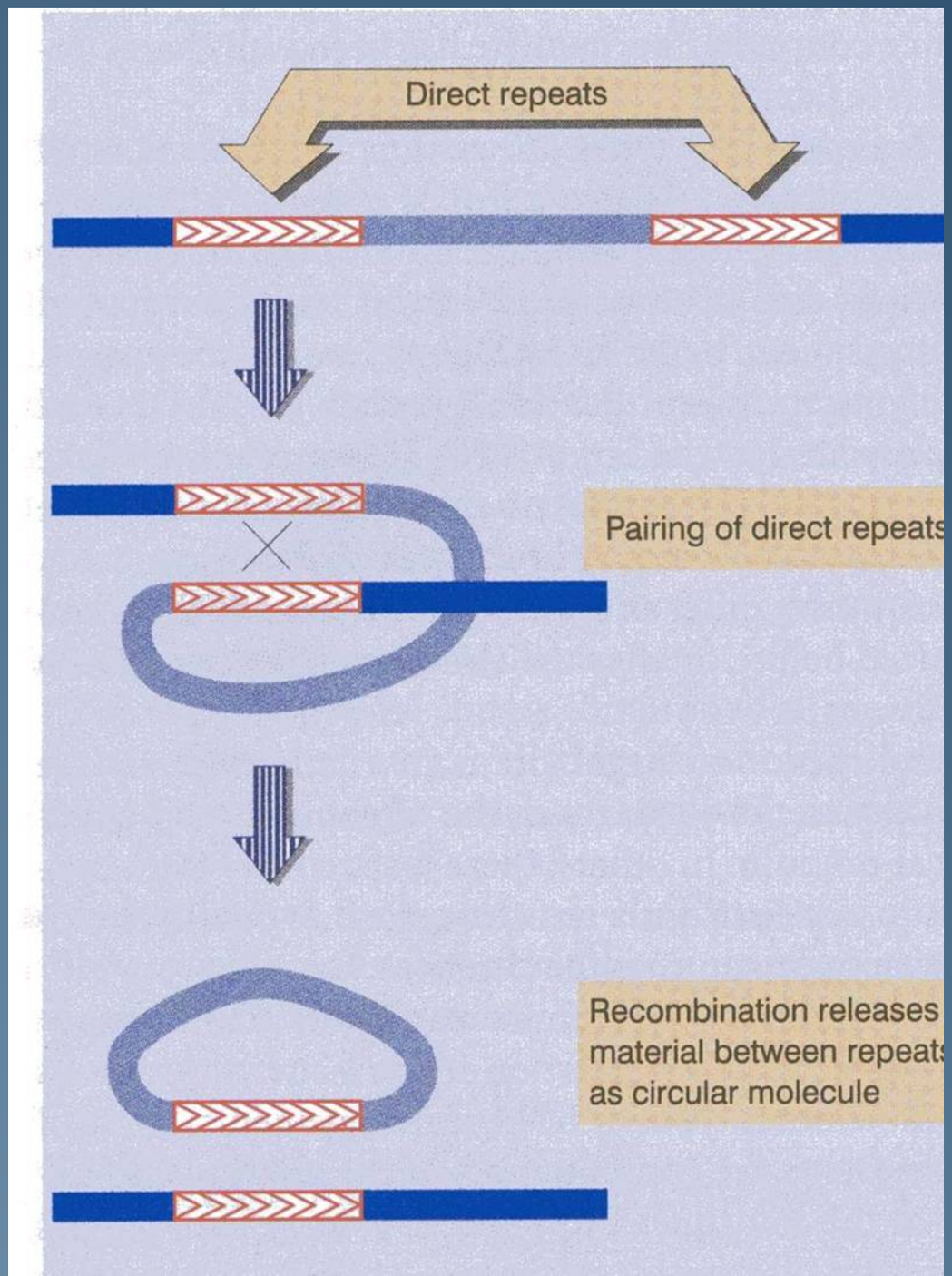
Transposición replicativa

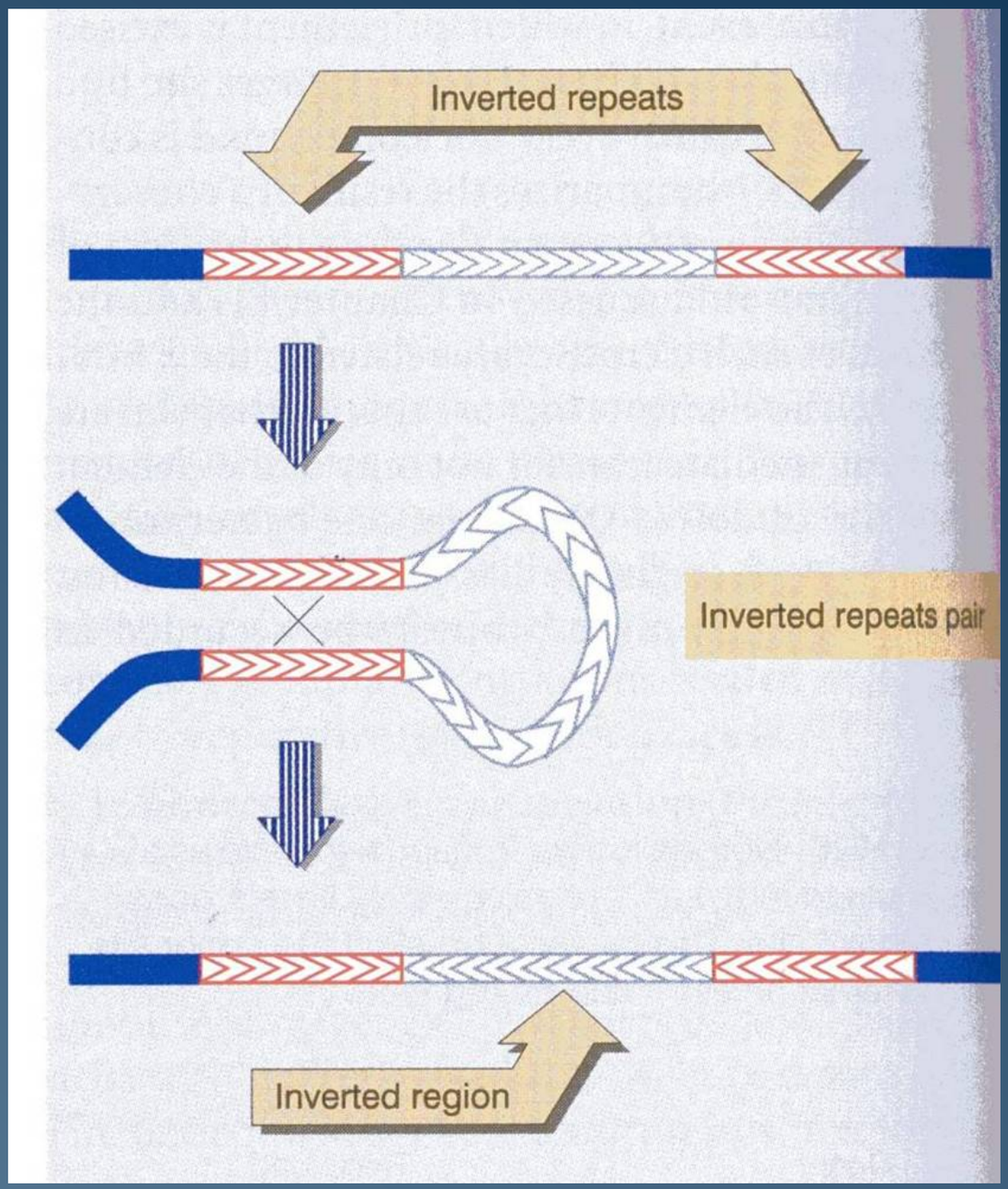
Transposición no-replicativa



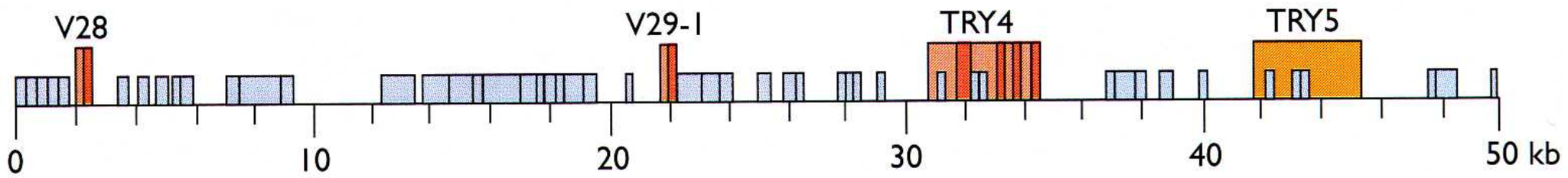

Genome (pg)
TE (%)
DNA (pg)
TE (%)
0.3%
5%
12%
22%
40%
45%
60%
77%
0.1 pg
0.2 pg
3.4 pg
3.5 pg
5.0 pg
8.0 pg
E. coli
S. cerevisiae
C. elegans
Drosophila m.
Mus musculus
Homo s.
Zea mays
Rana esculenta

La transposición produce deleciones e inversiones

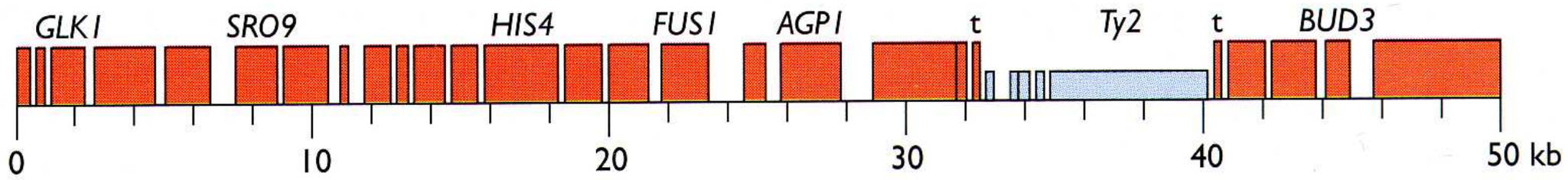




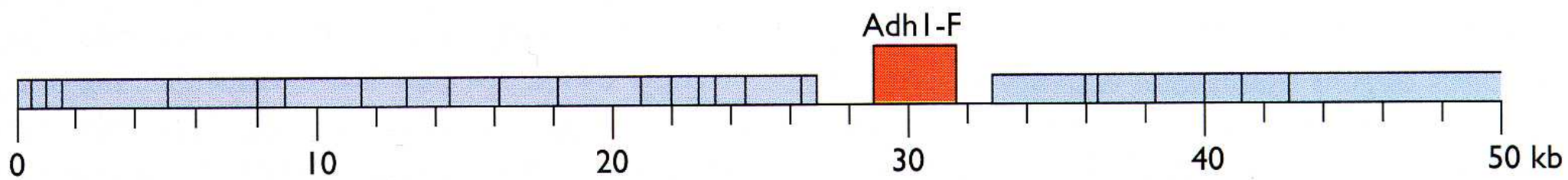
(A) Human



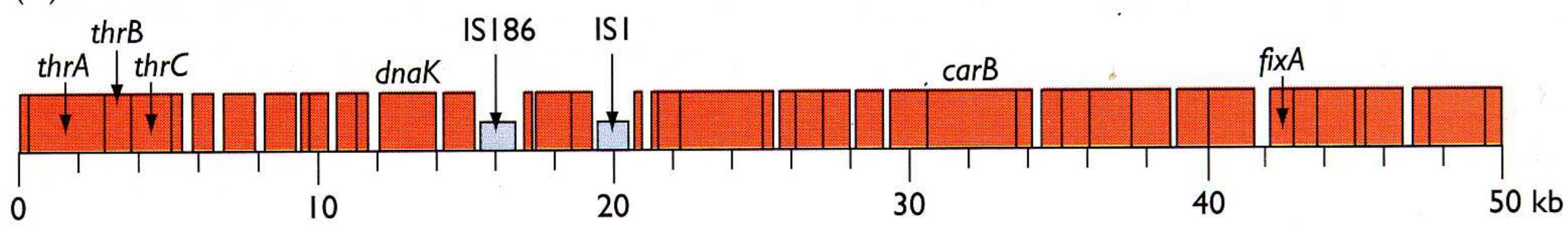
(B) *Saccharomyces cerevisiae*



(C) Maize



(D) *Escherichia coli*

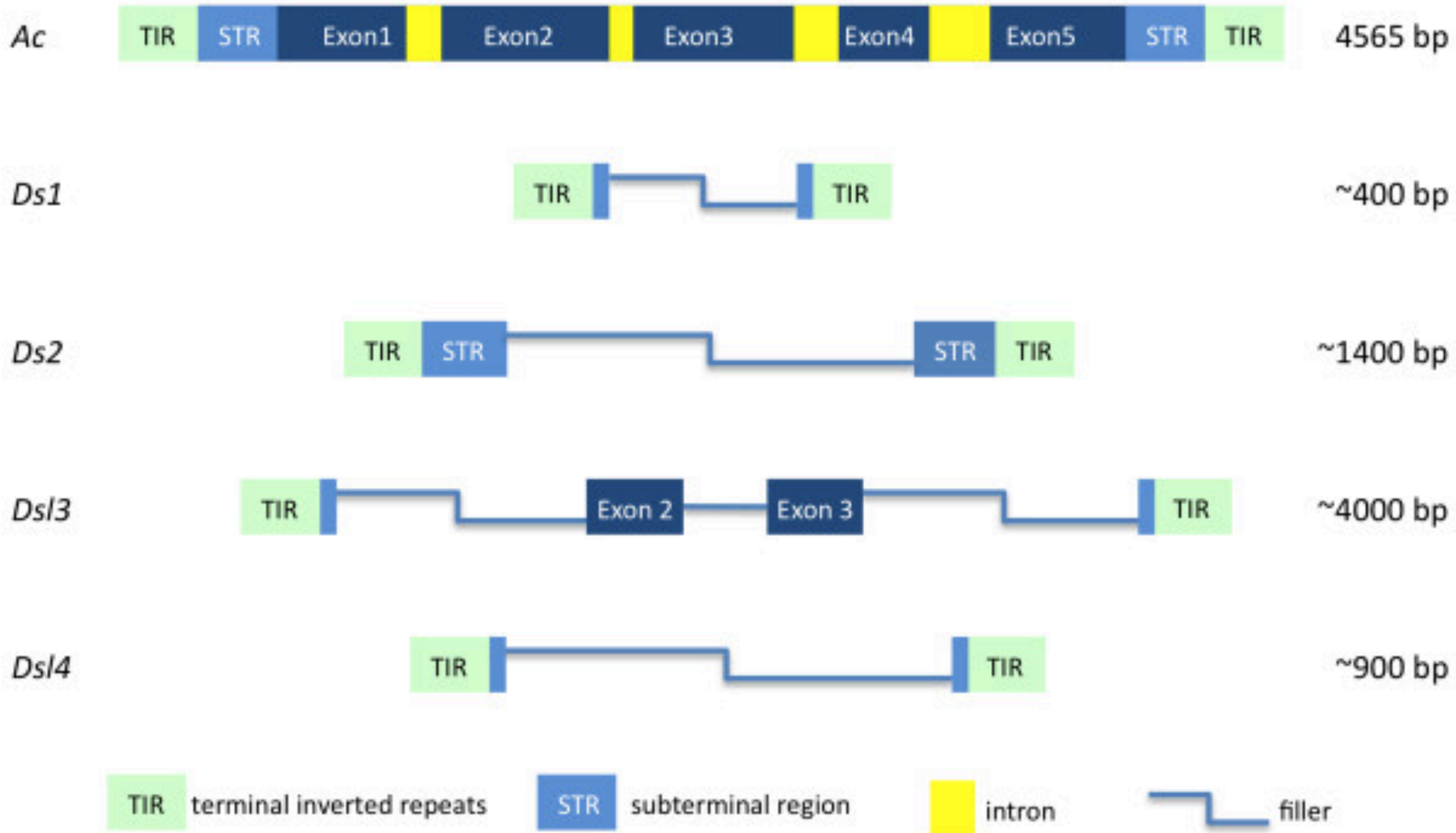


KEY

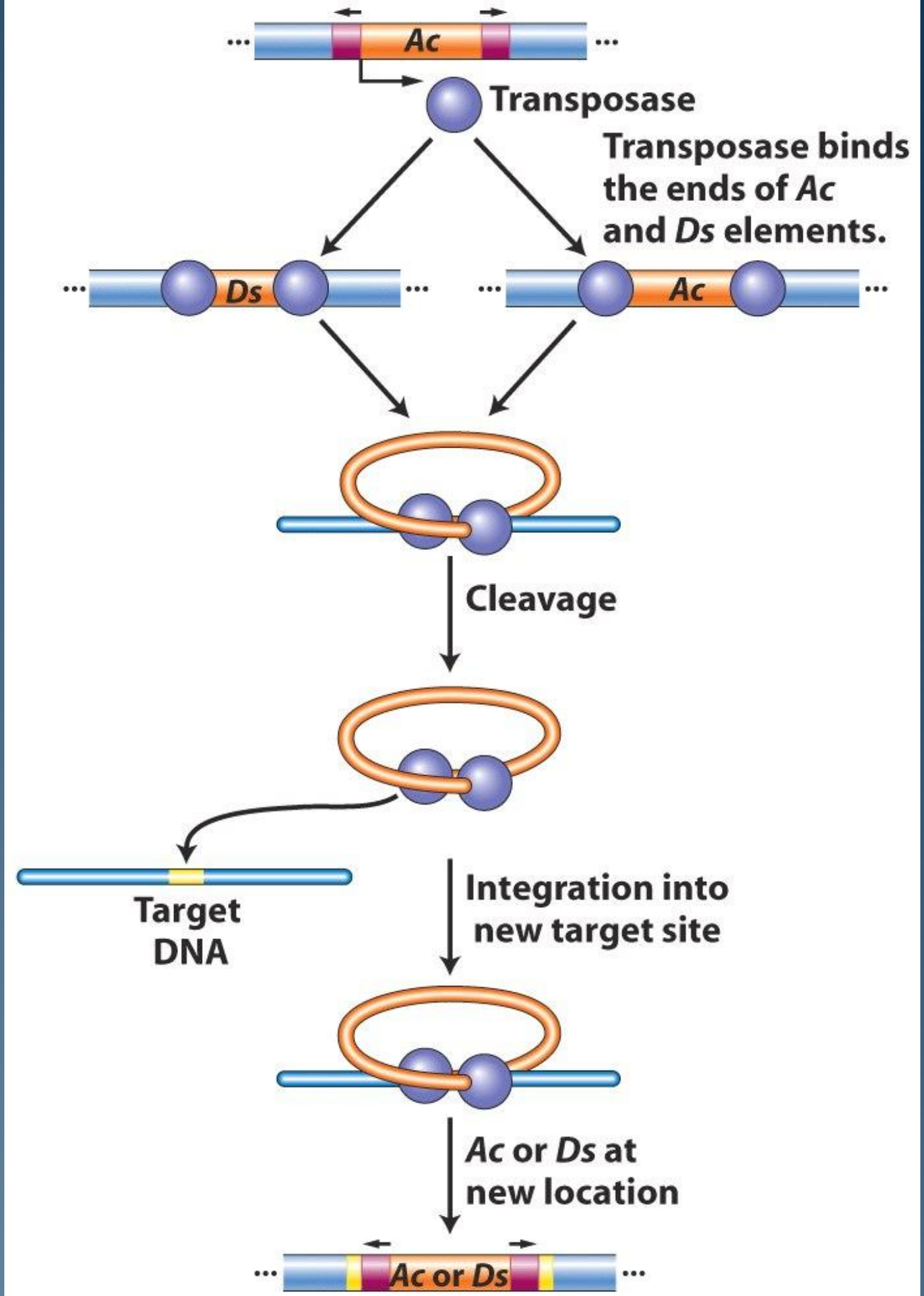
Gene | Intron | Human pseudogene | Genome-wide repeat | t tRNA gene

Transposable elements in the human genome

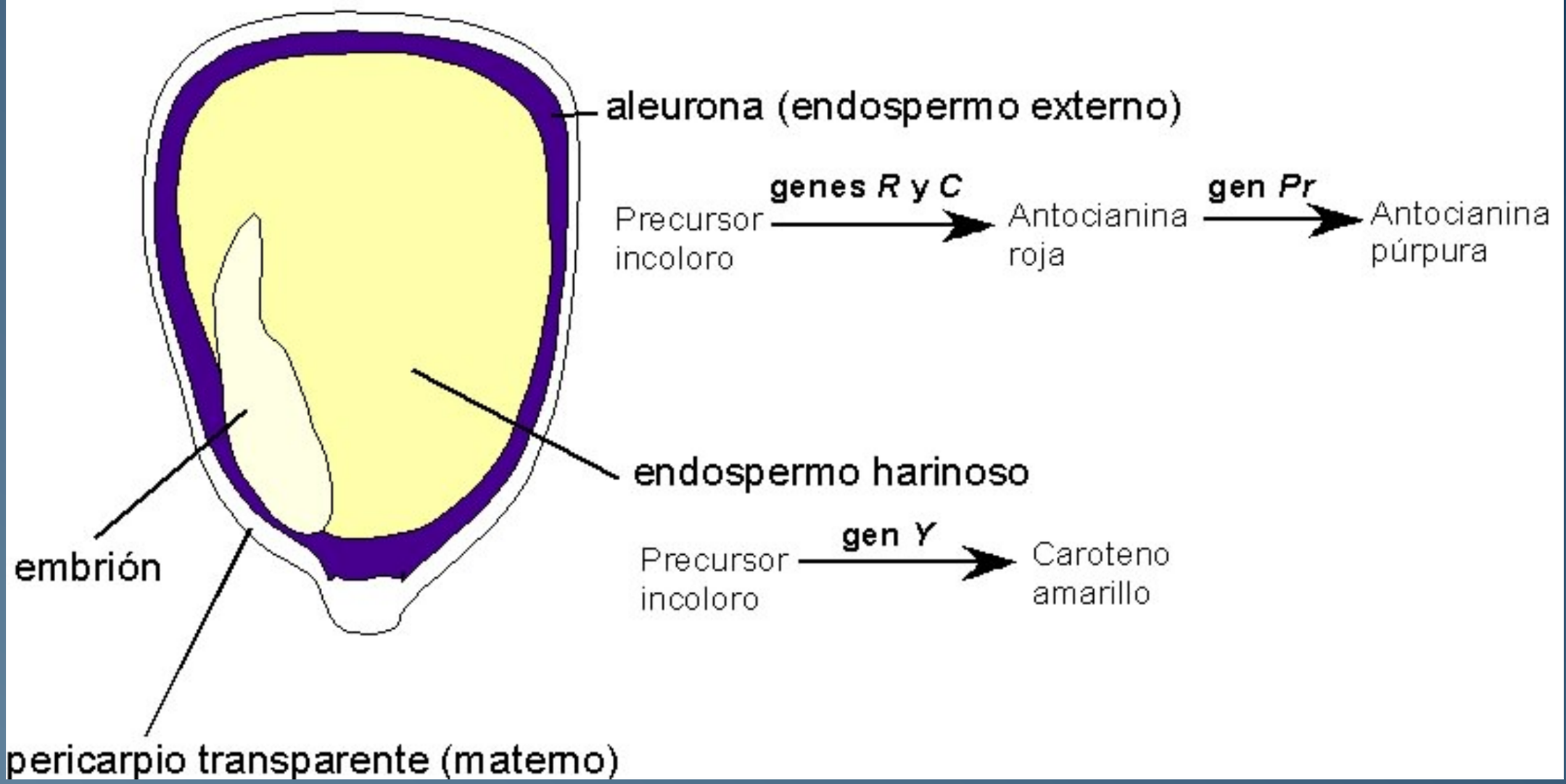
Class	Family	Approximate number of copies	Fraction of genome (%)
SINE	Alu	1,200,000	10.7
	MIR	450,000	2.5
	MIR3	85,000	0.4
LINE	LINE-1	600,000	17.3
	LINE-2	370,000	3.3
	LINE-3	44,000	0.3
LTR retroelements	ERV	240,000	4.7
	MaLR	285,000	3.8
DNA transposons	MER-1	213,000	1.4
	MER-2	68,000	1.0
	Others	60,000	0.4

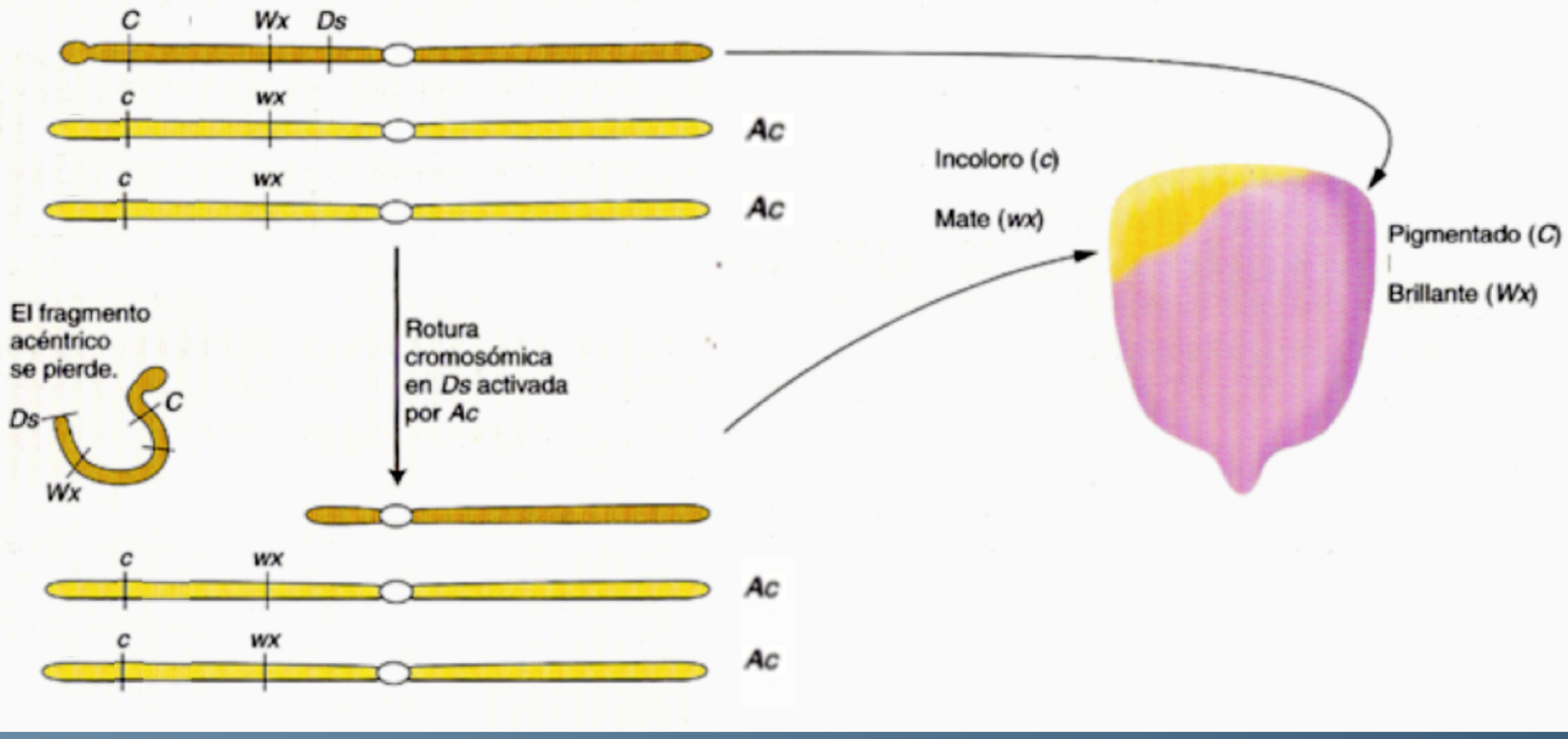


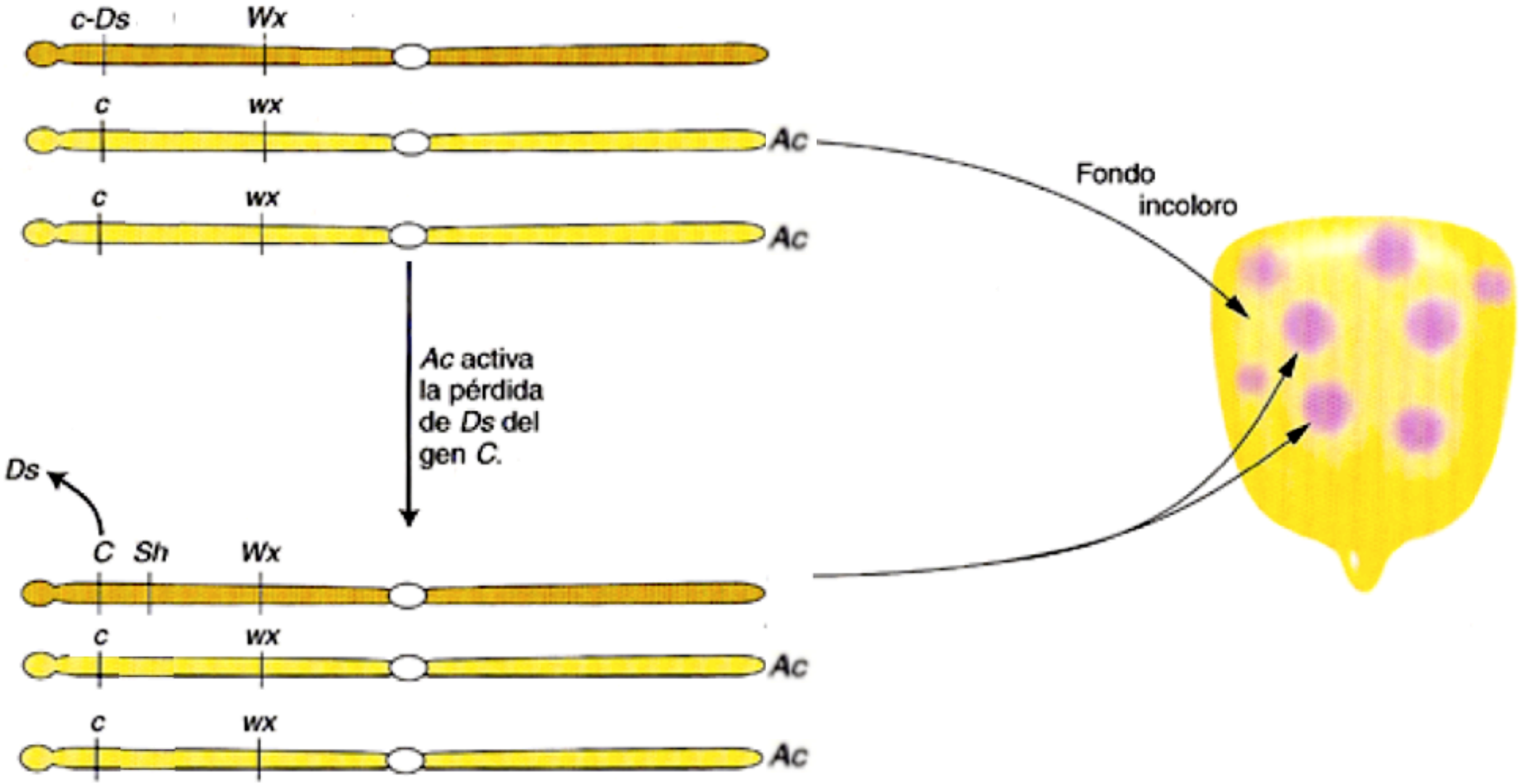
Structure of different types of *Ds* elements compared with *Ac*. *Ac* is 4565-bp long and encodes a 5-exon transposase. *Ds1* elements are the shortest and share little in common with *Ac*. *Ds2* elements have ~200 bp of the *Ac* subterminal region at each end. *Ds-l3* elements carry sequences corresponding to parts of exons 2 and 3 of the *Ac* transposase and are the longest *Ds* elements, on average. *Ds-l4* elements have a modal length of about 1 kb and share with *Ac* only about 30 bp at either end.

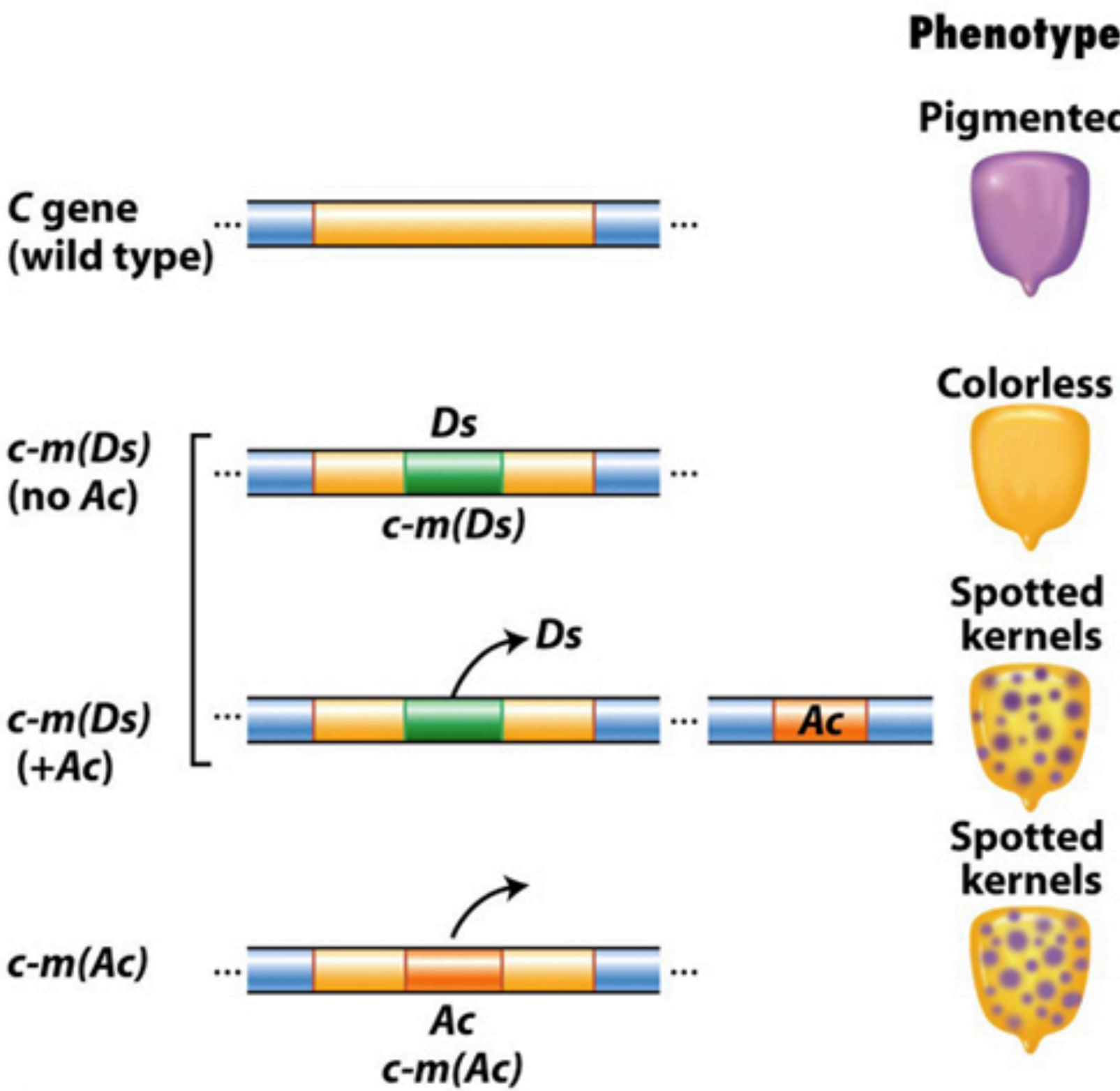

Ac
Transposase
Transposase binds
the ends of Ac
and Ds elements.
Ds
Ac
Cleavage
Target
DNA
Integration into
new target site
Ac or Ds at
new location
Ac or Ds

Determinación del color en la semilla de maíz



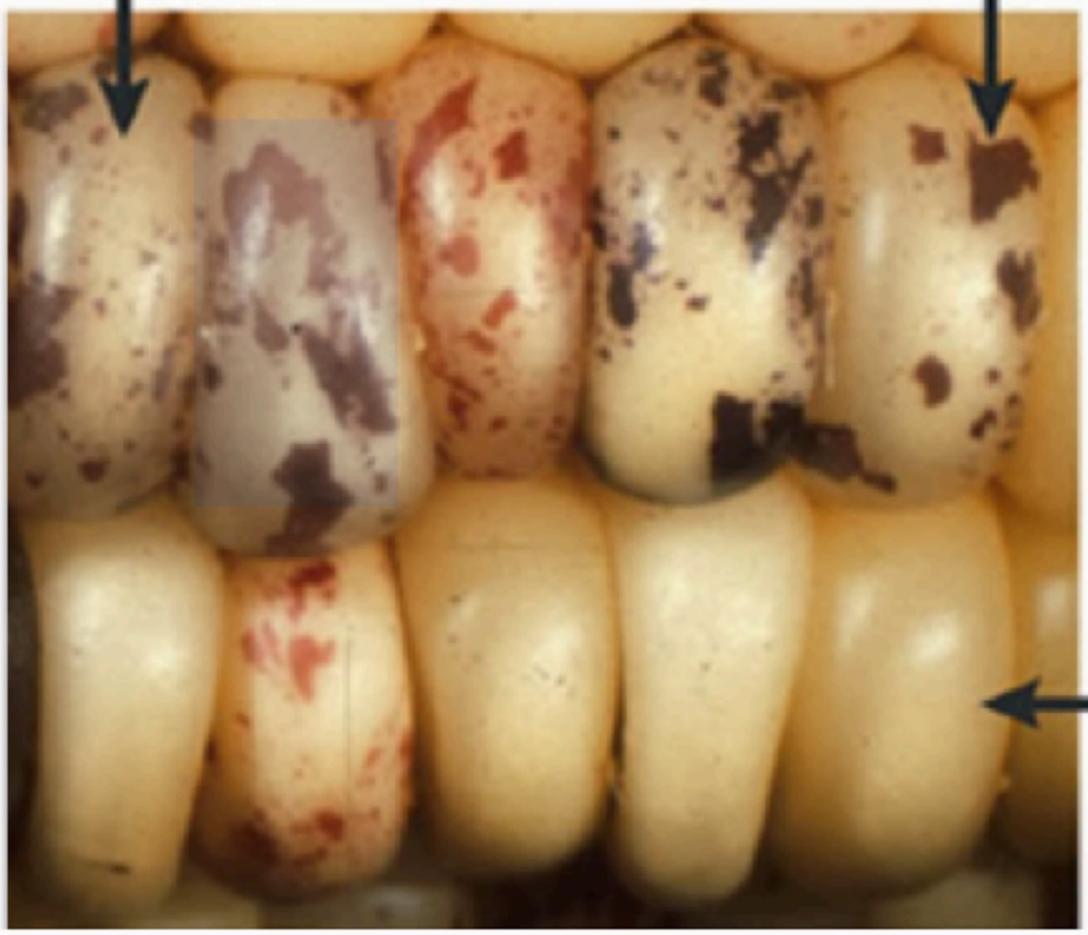

C
Wx
Ds
c
wx
Ac
c
wx
Ac
El fragmento acéntrico se pierde.
Ds
C
Wx
Rotura cromosómica en Ds activada por Ac
c
wx
Ac
c
wx
Ac
Incoloro (c)
Mate (wx)
Pigmentado (C)
Brillante (Wx)


c-Ds
Wx
c
wx
Ac
c
wx
Ac
Ac activa
la pérdida
de Ds del
gen C.
Fondo
incoloro
Ds
C
Sh
Wx
c
wx
Ac
c
wx
Ac

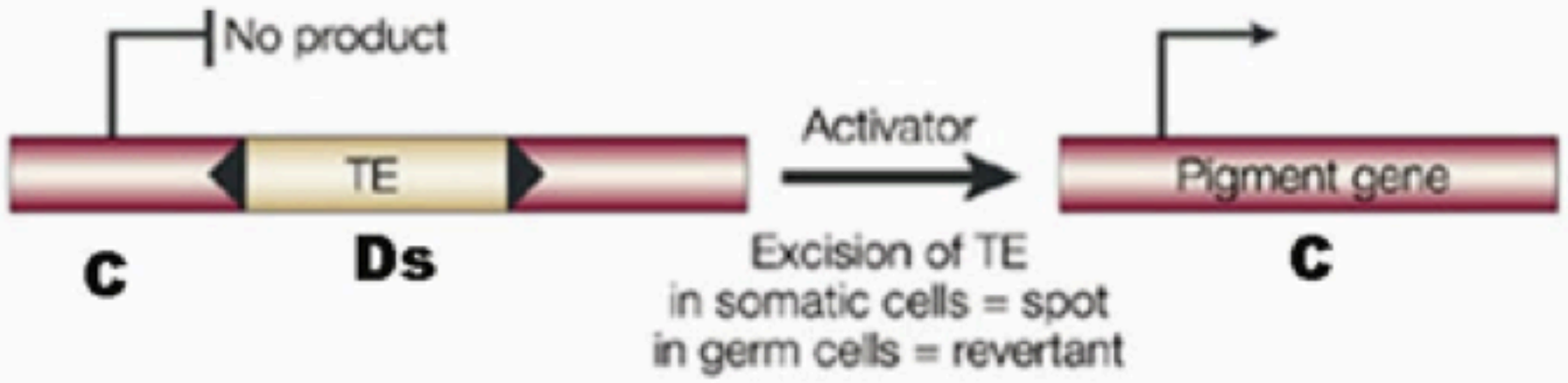

Phenotypes
C gene
(wild type)
Pigmented
Ds
c-m(Ds)
(no Ac)
c-m(Ds)
Colorless
Spotted
kernels
Ds
c-m(Ds)
(+Ac)
Ac
Spotted
kernels
c-m(Ac)
Ac
c-m(Ac)

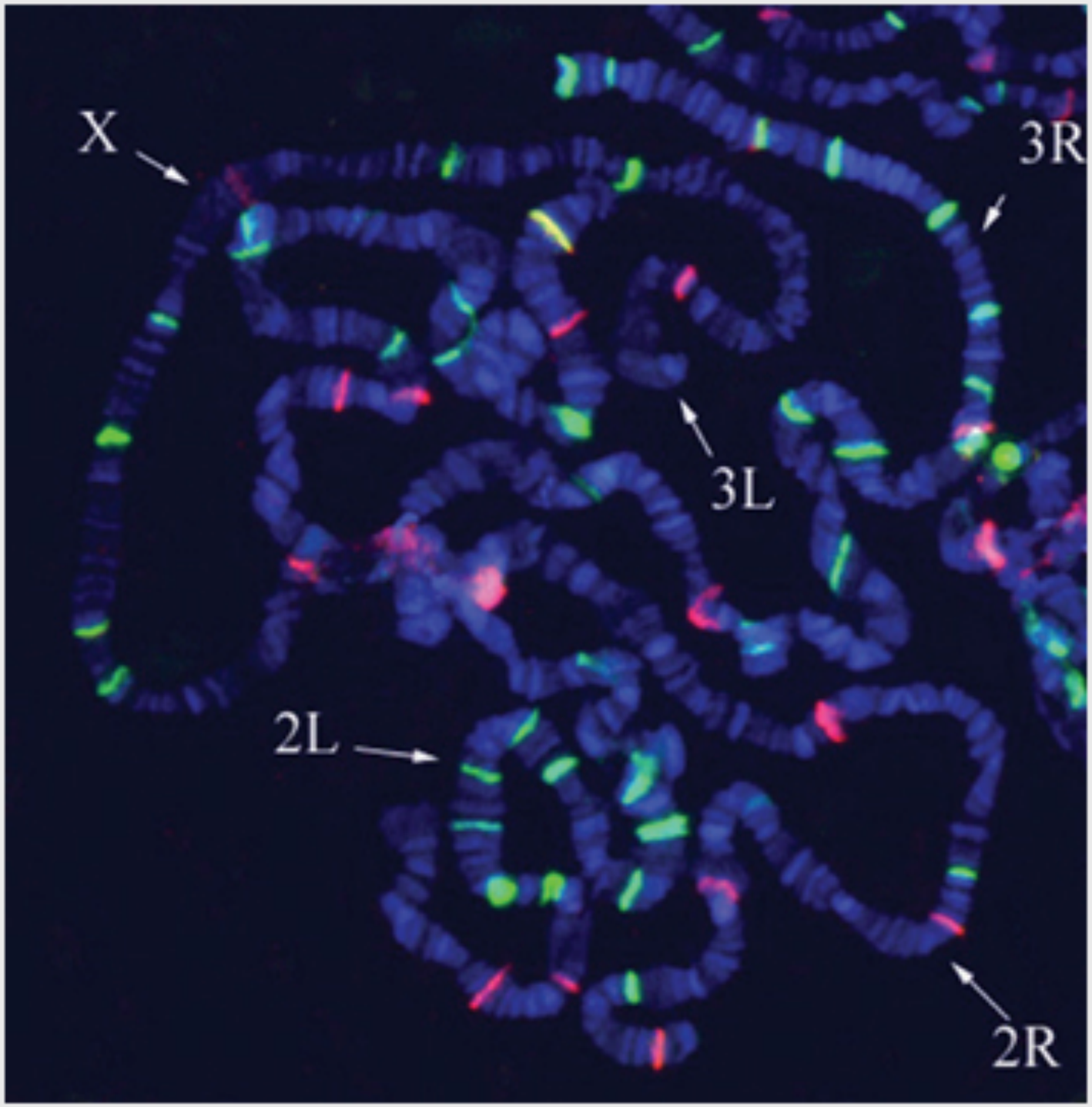
Small spots:
frequent excision
late in kernel
development

Large spot:
excision early in
kernal development



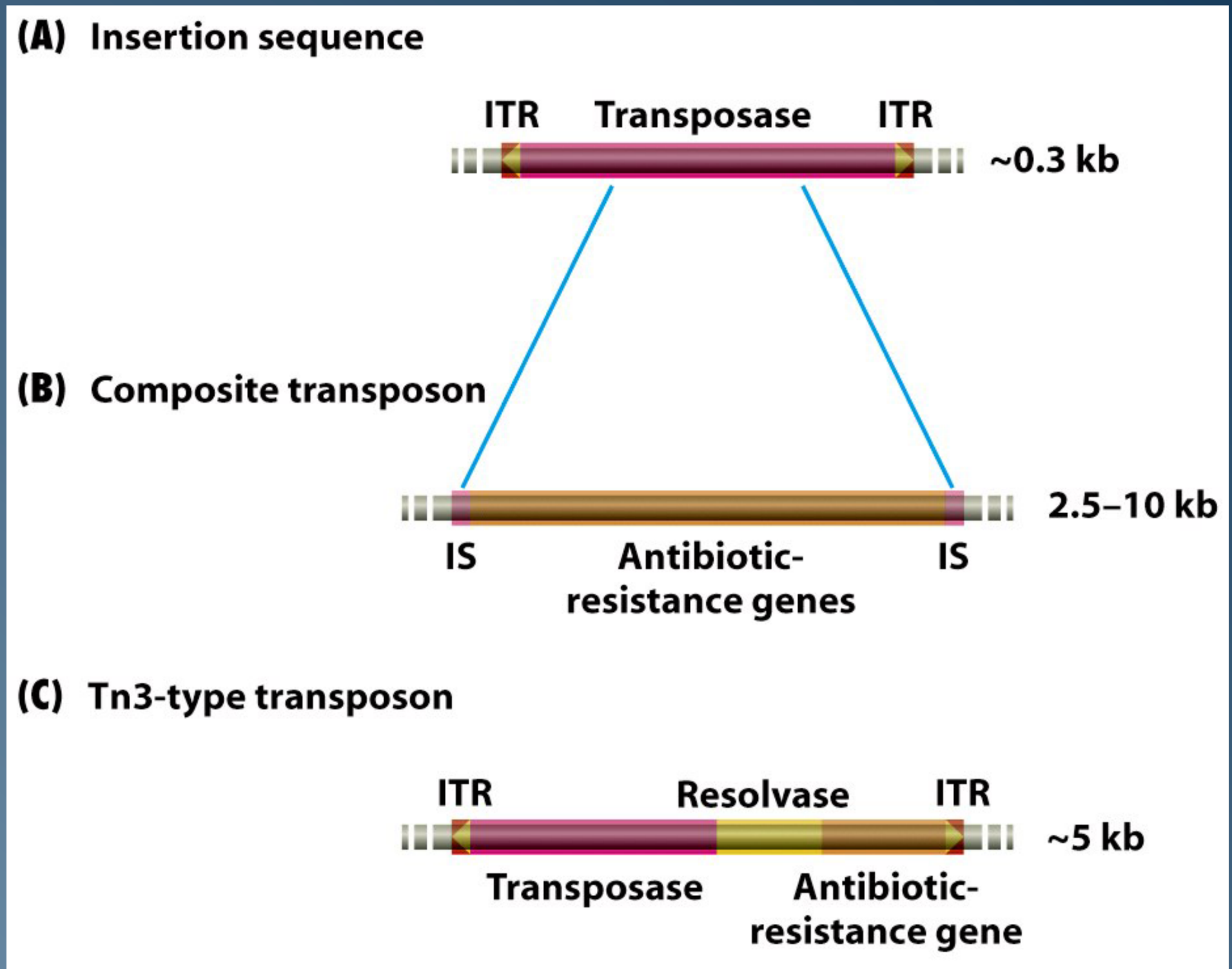
No excision,
autonomous
element not
in genome



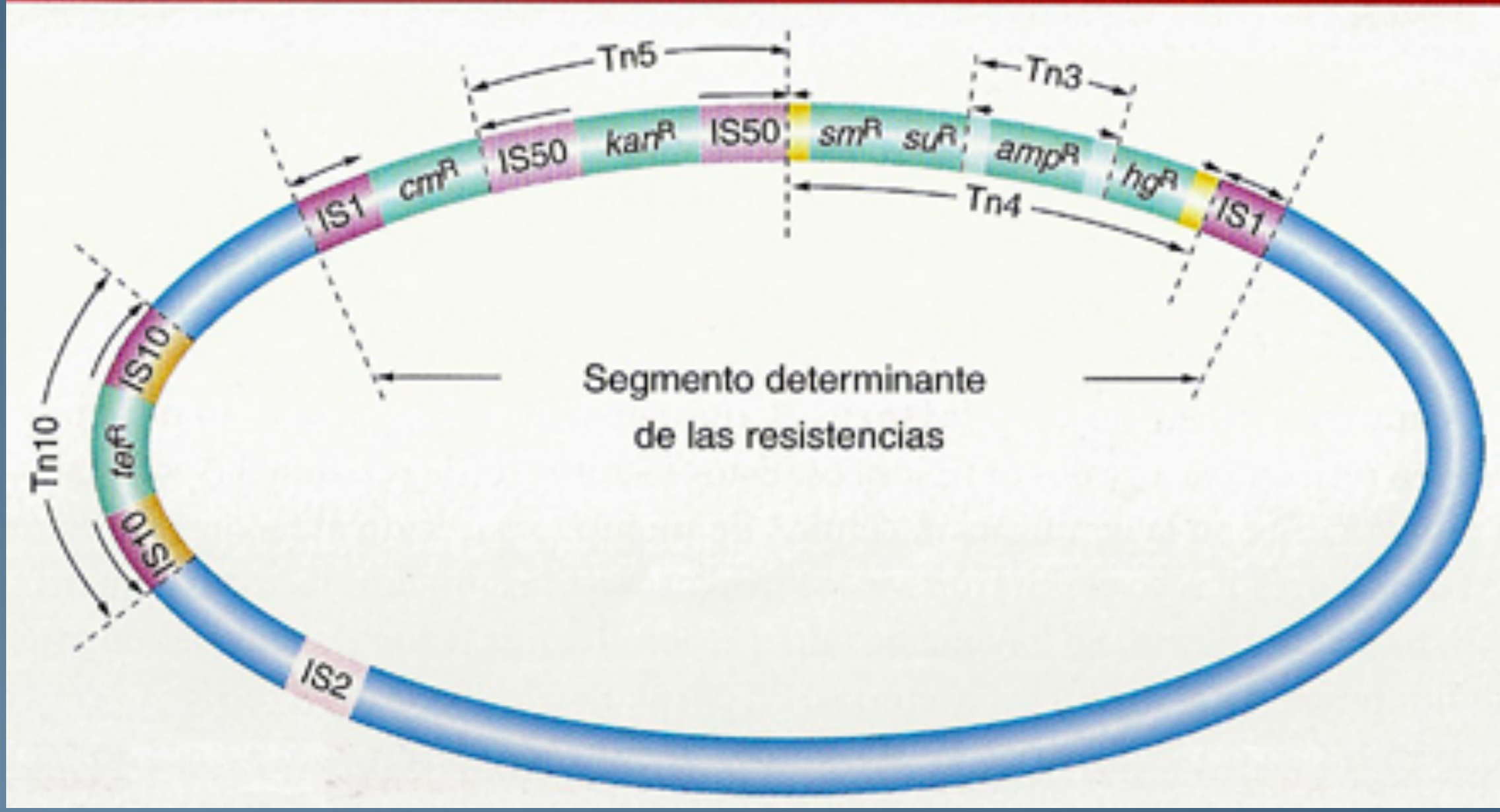


Fluorescence *in situ* hybridization (2005) of fluorescein isothiocyanate-labeled *hobo* DNA and Cy3-labeled *mdg1* DNA on the salivary gland polytene chromosomes from *y cn bw sp* strain. Black arrows show chromosome arms, gray arrows show *mdg1* hybridization sites.

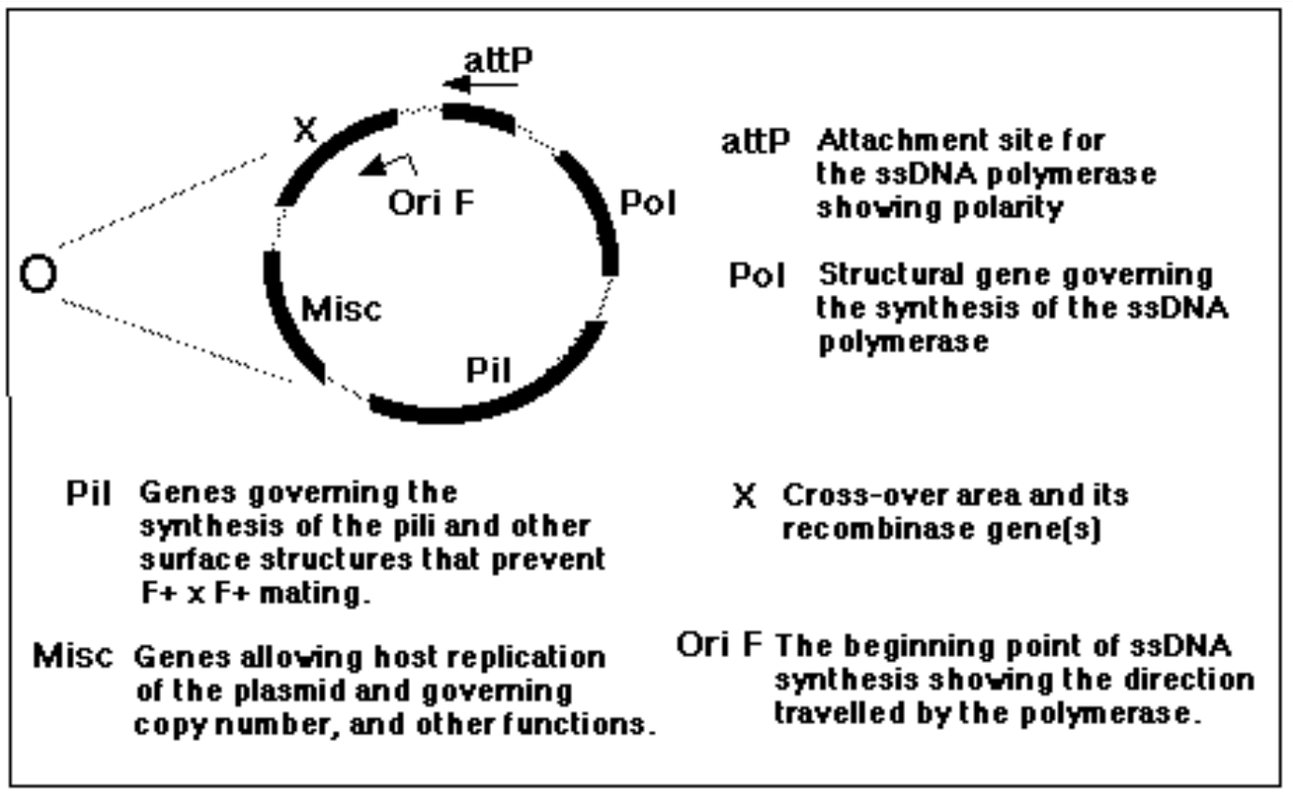
Transposones bacterianos

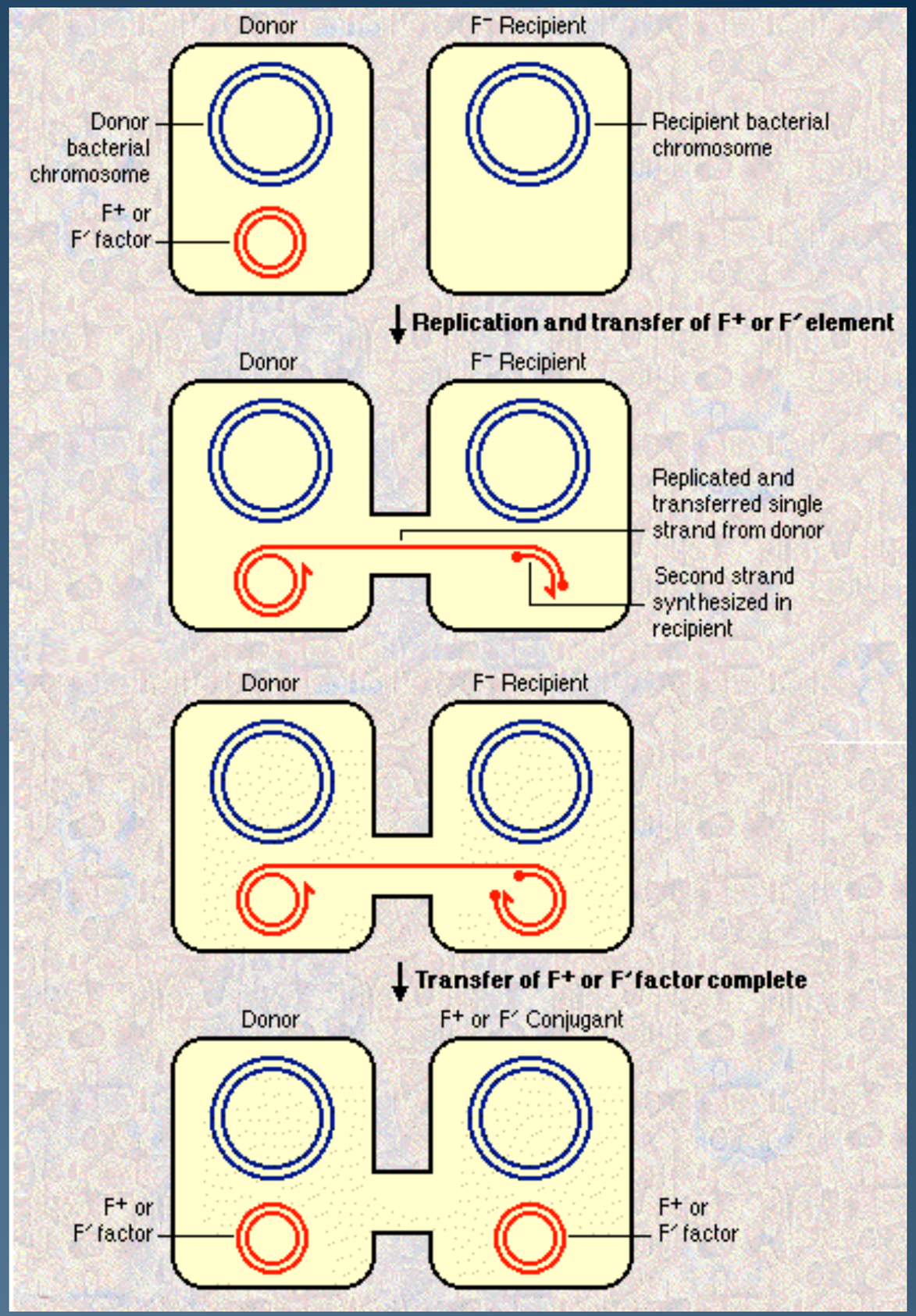


Un plásmido R puede contener varios transposones portadores de genes de resistencia

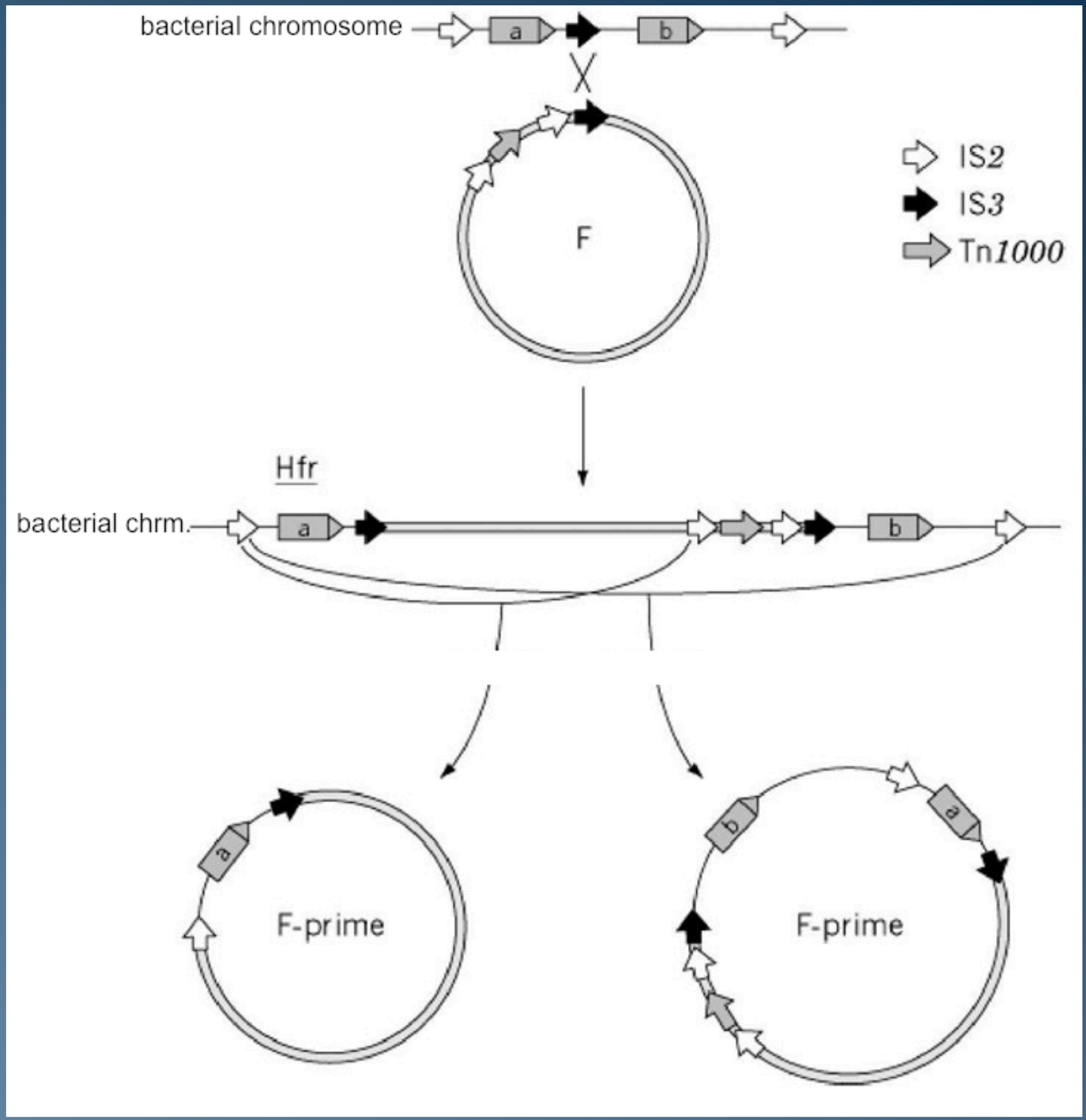


Factor F : Conjugación bacteriana:





Factor F´


bacterial chromosome
a
b
F
IS2
IS3
Tn1000
Hfr
bacterial chrm.
a
b
F-prime
F-prime
b
a