Chromosomal Aberrations

Types of Chromosome

Metacentric:

Telocentric:

Acrocentric:

Sub-metacentric:

Variations in Chromosome Number and Arrangement

Terminology

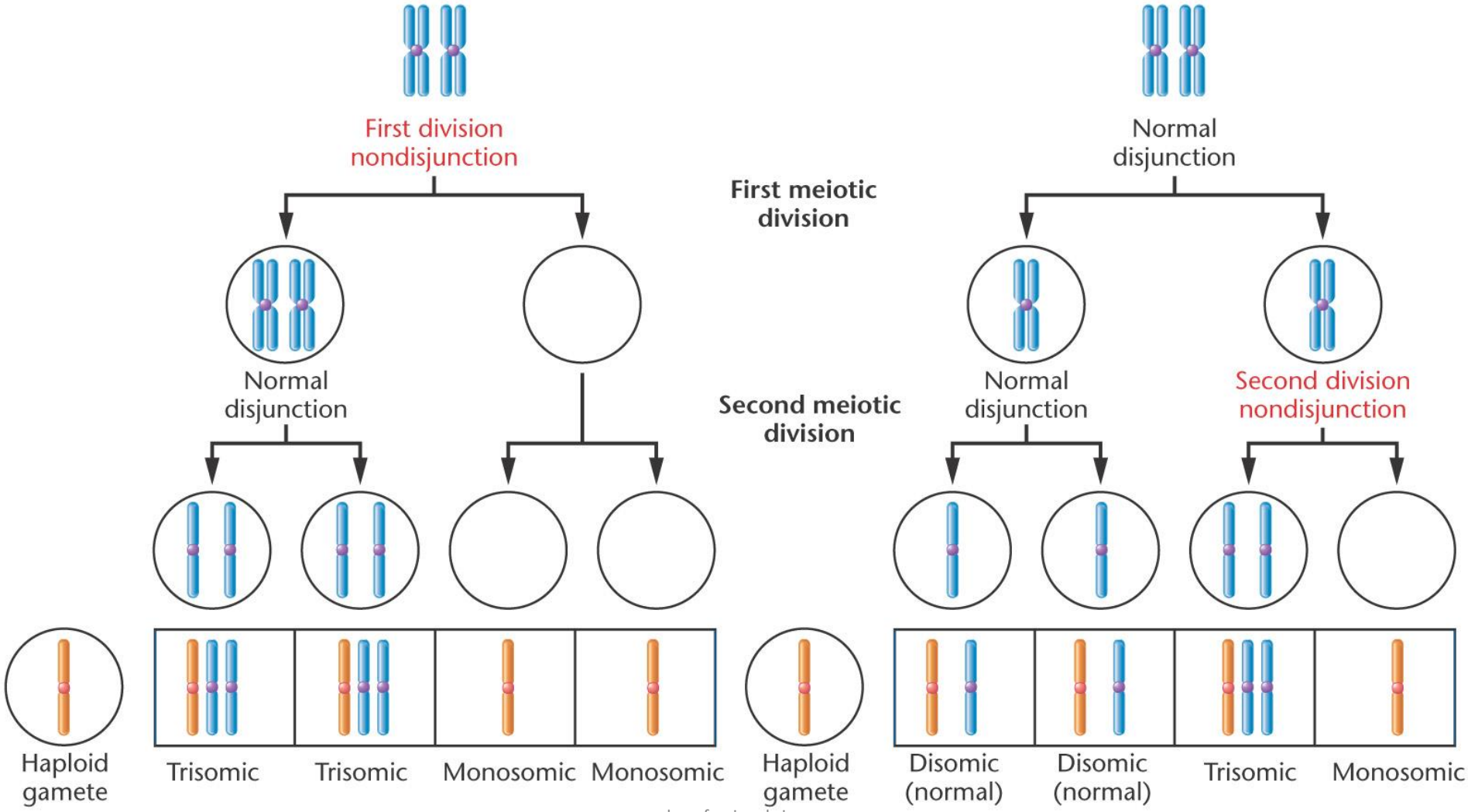
different

TABLE 8.1 TERMINOLOGY FOR VARIATION IN CHROMOSOME NUMBERS

Term	Explanation
Aneuploidy	$2n \pm x$ chromosomes
Monosomy	$2n - 1$
Trisomy	$2n + 1$
Tetrasomy, pentasomy, etc.	$2n + 2$, $2n + 3$, etc.
Euploidy	Multiples of n
Diploidy	$2n$
Polyploidy	$3n$, $4n$, $5n$, . . .
Triploidy	$3n$
Tetraploidy, pentaploidy, etc.	$4n$, $5n$, etc.
Autopolyploidy	Multiples of the same genome
Allopolyploidy (Amphidiploidy)	Multiples of different genomes

Aneuploidy

Nondisjunction



Nondisjunction In Drosophila

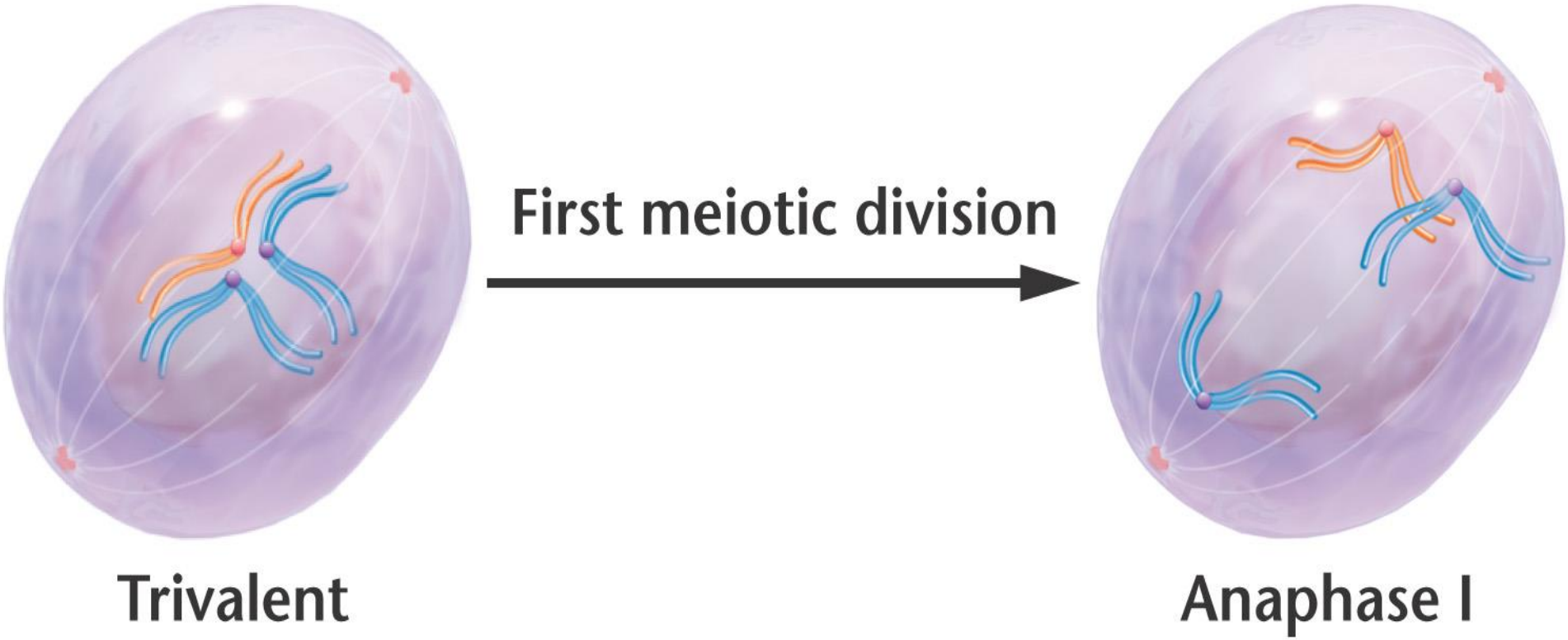
	W	Y
w	Ww (Red eyed female)	wY (White eyed Male)
ww	Www Dies	wwY White eyed female
(-)	W- Red eyed Male (Sterile)	-Y Dies

	W	Y
ww	Www (Super female dies)	wwY (White eyed female)
Y	WY Red eyed Male	YY Dies
w	Ww Red eyed Female	wY White eyed Male
wY	WwY Red eyed female	wYY White eyed Male

Monosomy

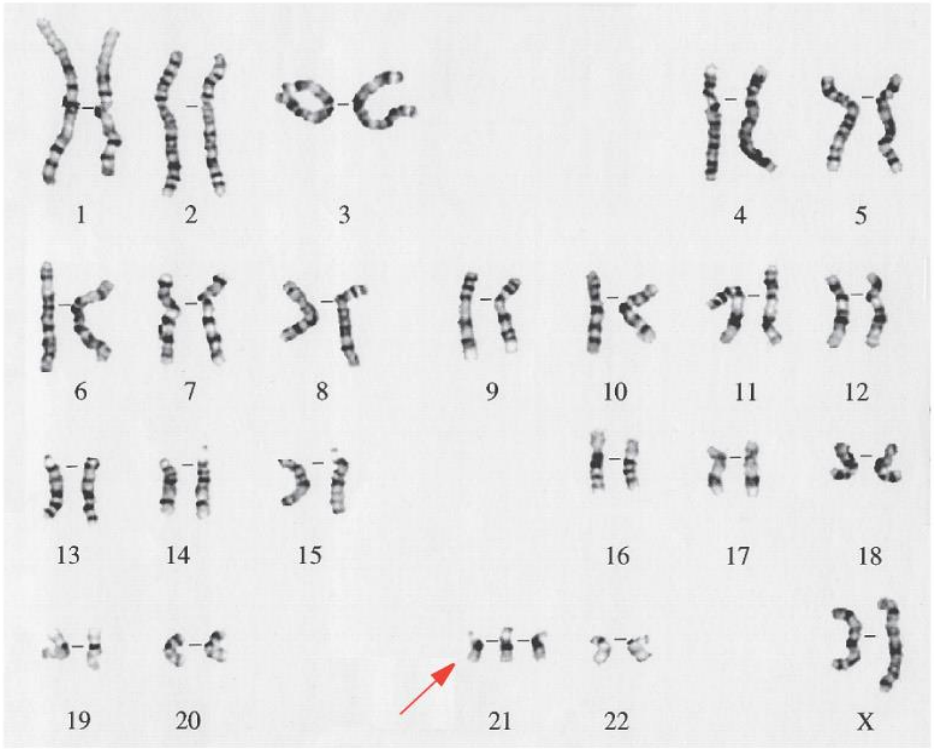
Trisomy

Trisomy Meiosis



Down Syndrome

Down Syndrome – Trisomy 21



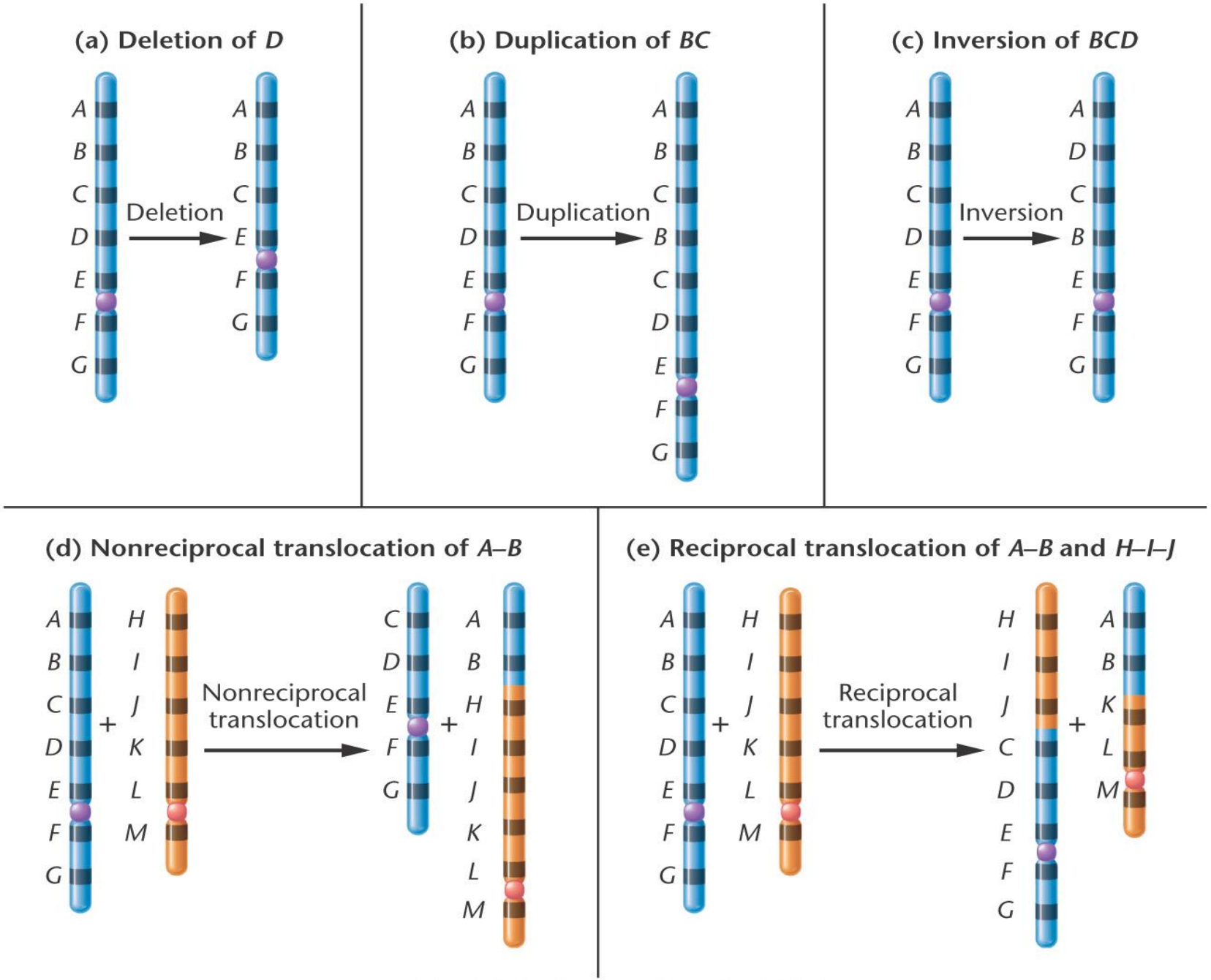
Polyploidy in Plants

Autopolyploidy

Allopolyploidy

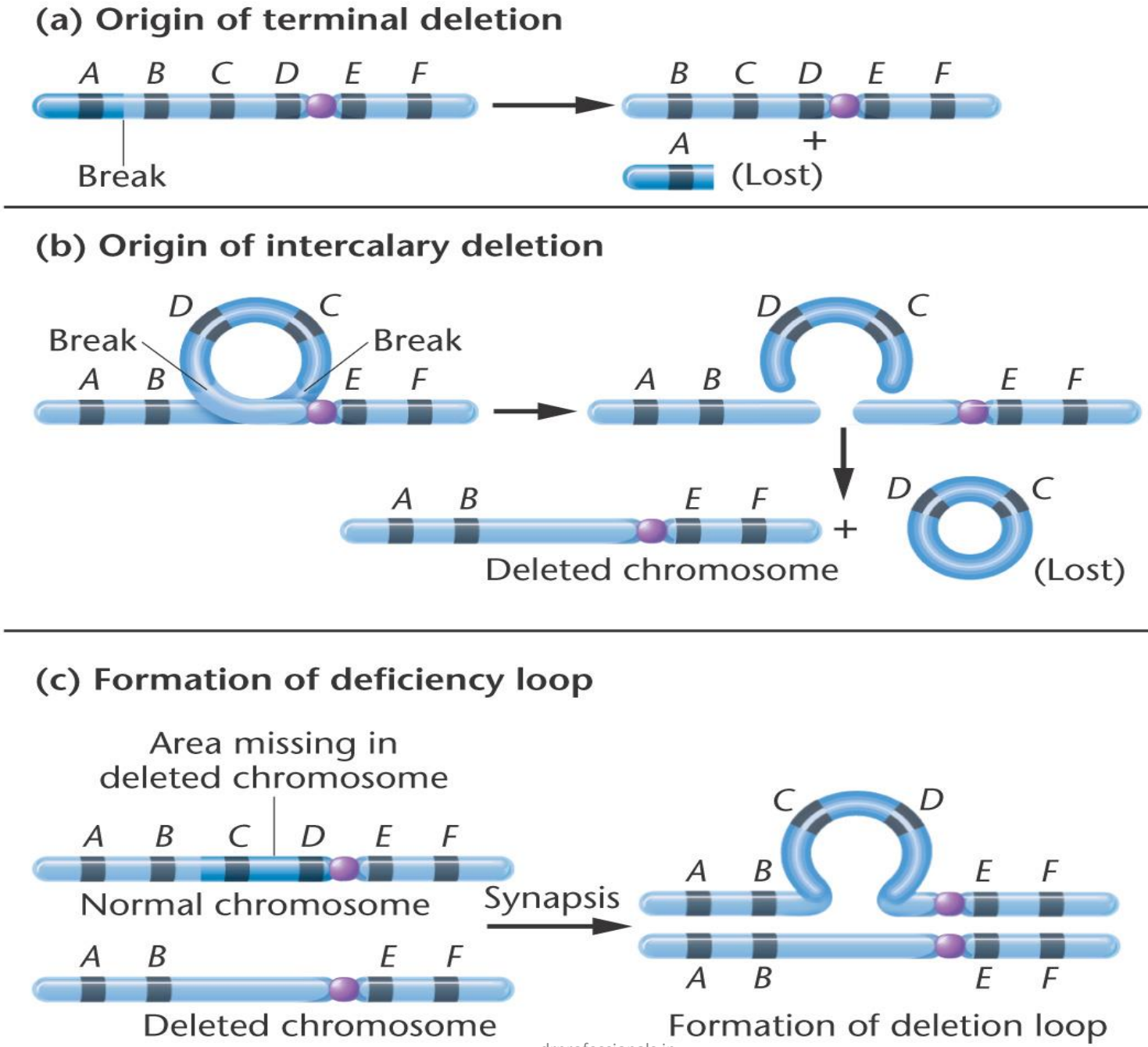
Allotetraploids

Chromosome Rearrangements



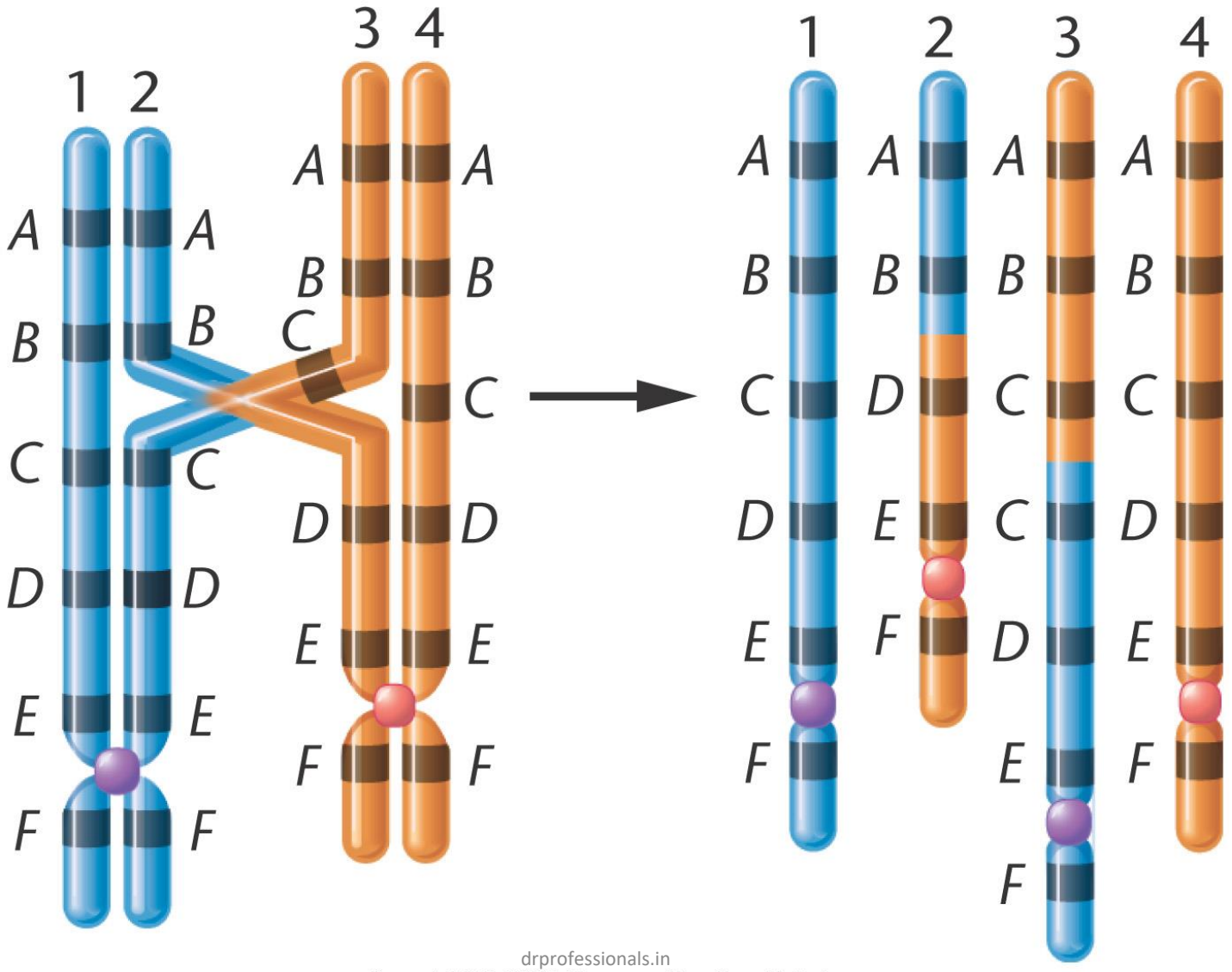
Consequences of Rearrangements

Deletions



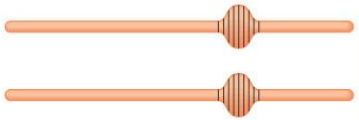
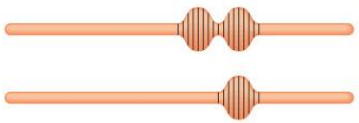
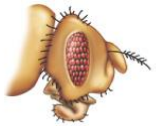
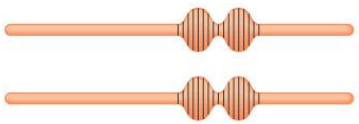
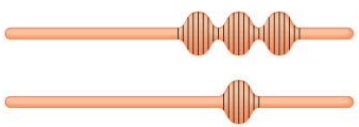
Duplications

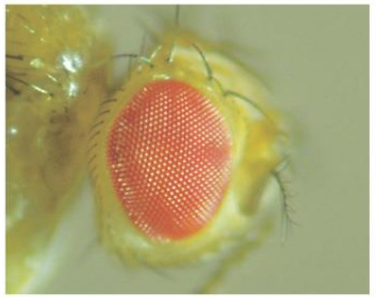
Unequal Crossing Over



Position Effects

(a) Genotypes and Phenotypes

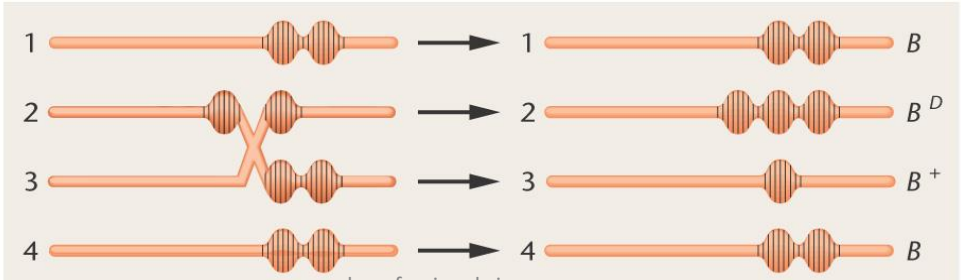
Genotype	Facet Number	Phenotype	= 16A segments
B^+/B^+	779		
B/B^+	358		
B/B	68		
B^D/B^+	45		



B^+/B^+

B/B^+

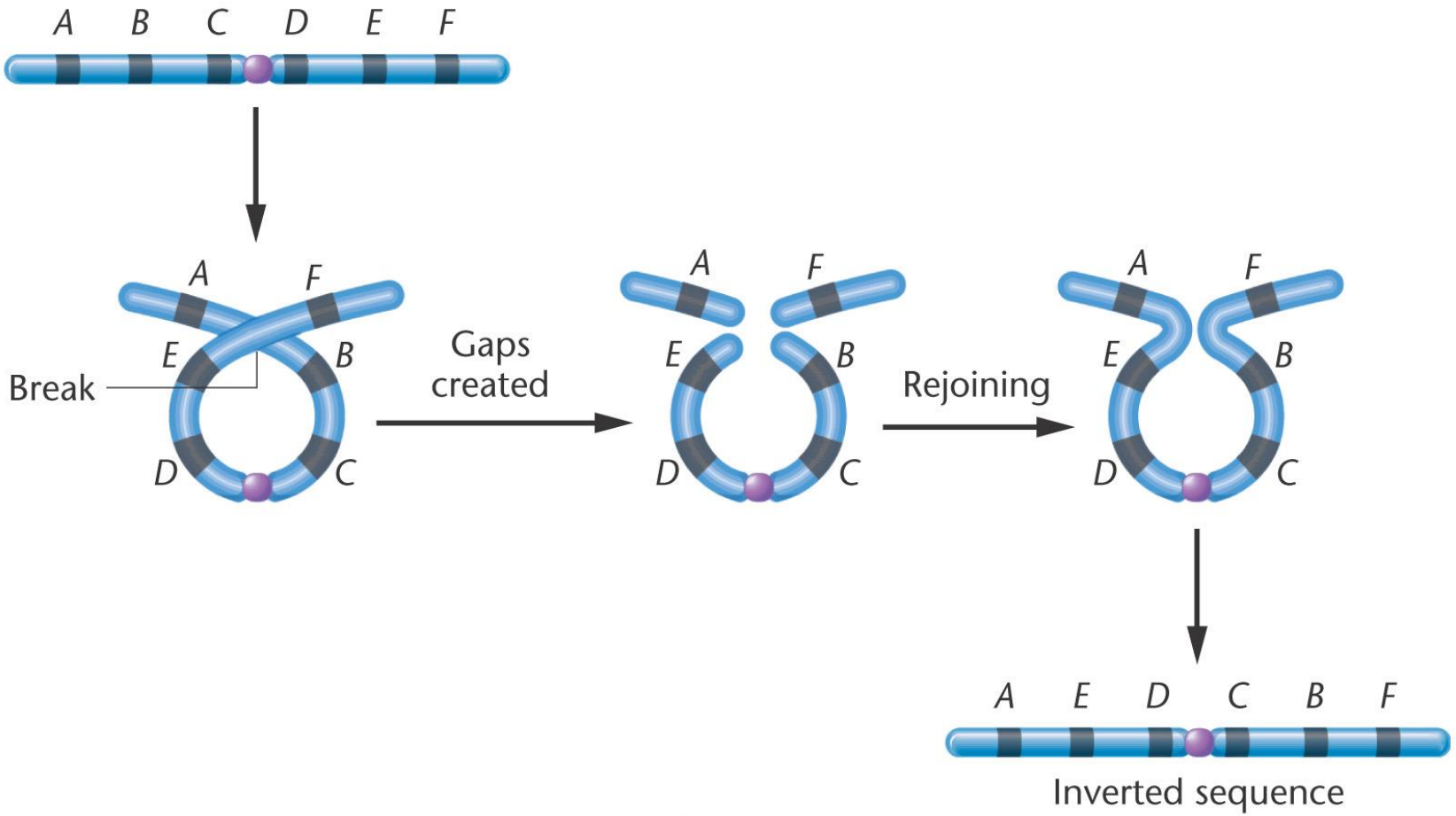
(b) Origin of B^D allelle as a result of unequal crossing over



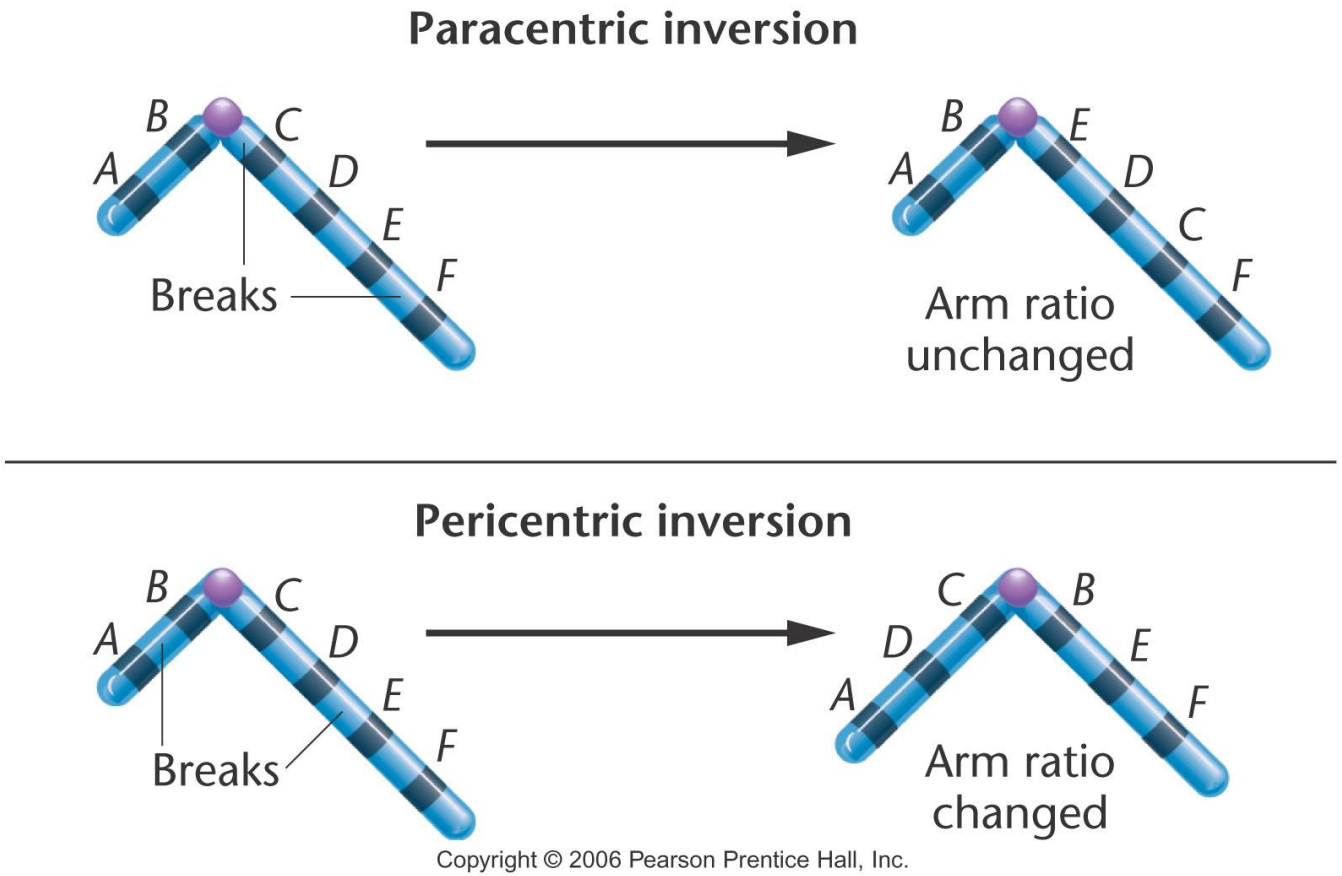
B/B

Position Effect –Bar Eye condition in Drosophila	
X Chromosome	Phenotype
B / B	Normal
BB / B	Heterozygous
BB / BB	Homozygous Bar Eye
BBB / B	Heterozygous Ultra Bar
BBB / BBB	Homozygous Ultra Bar

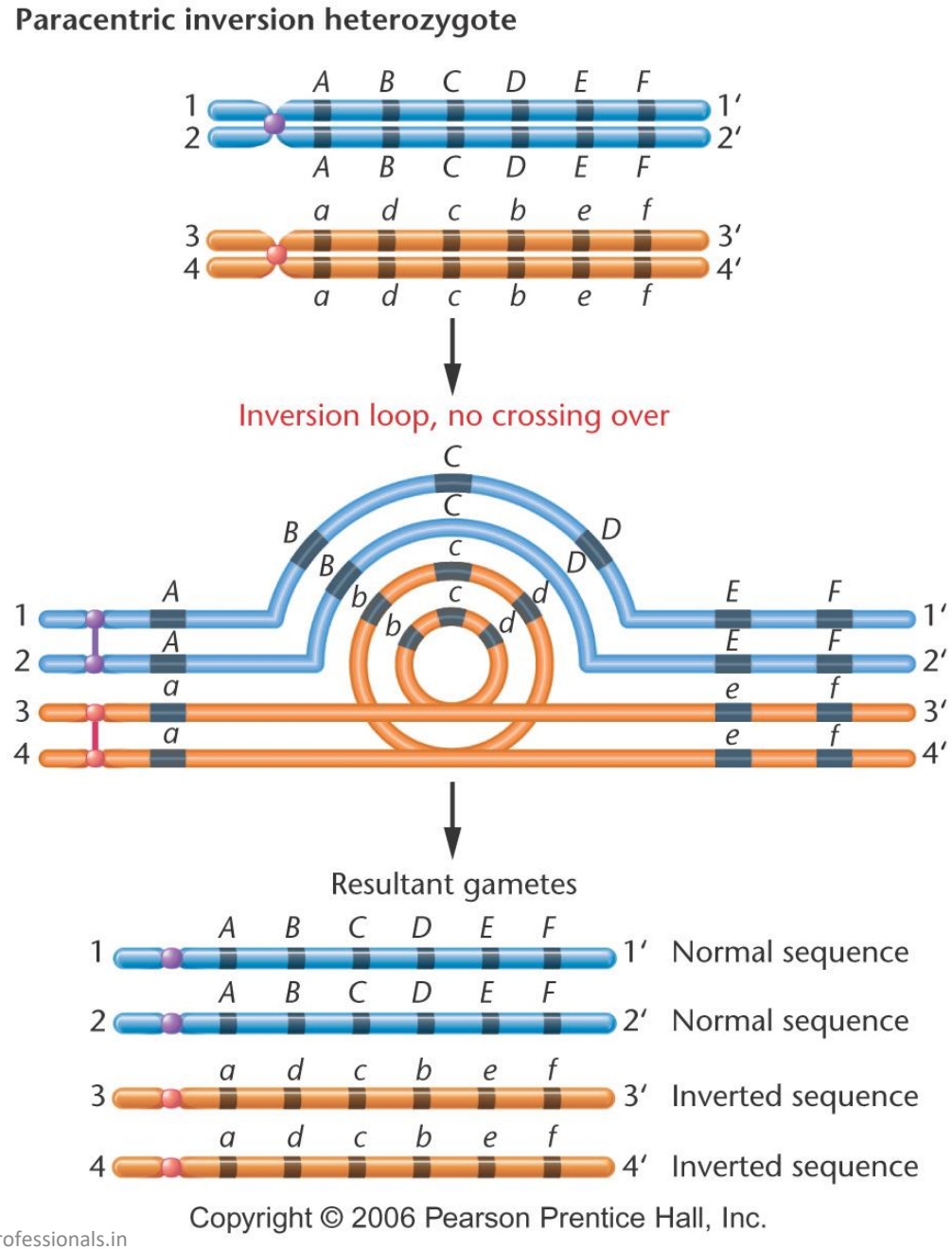
Chromosomal Inversions



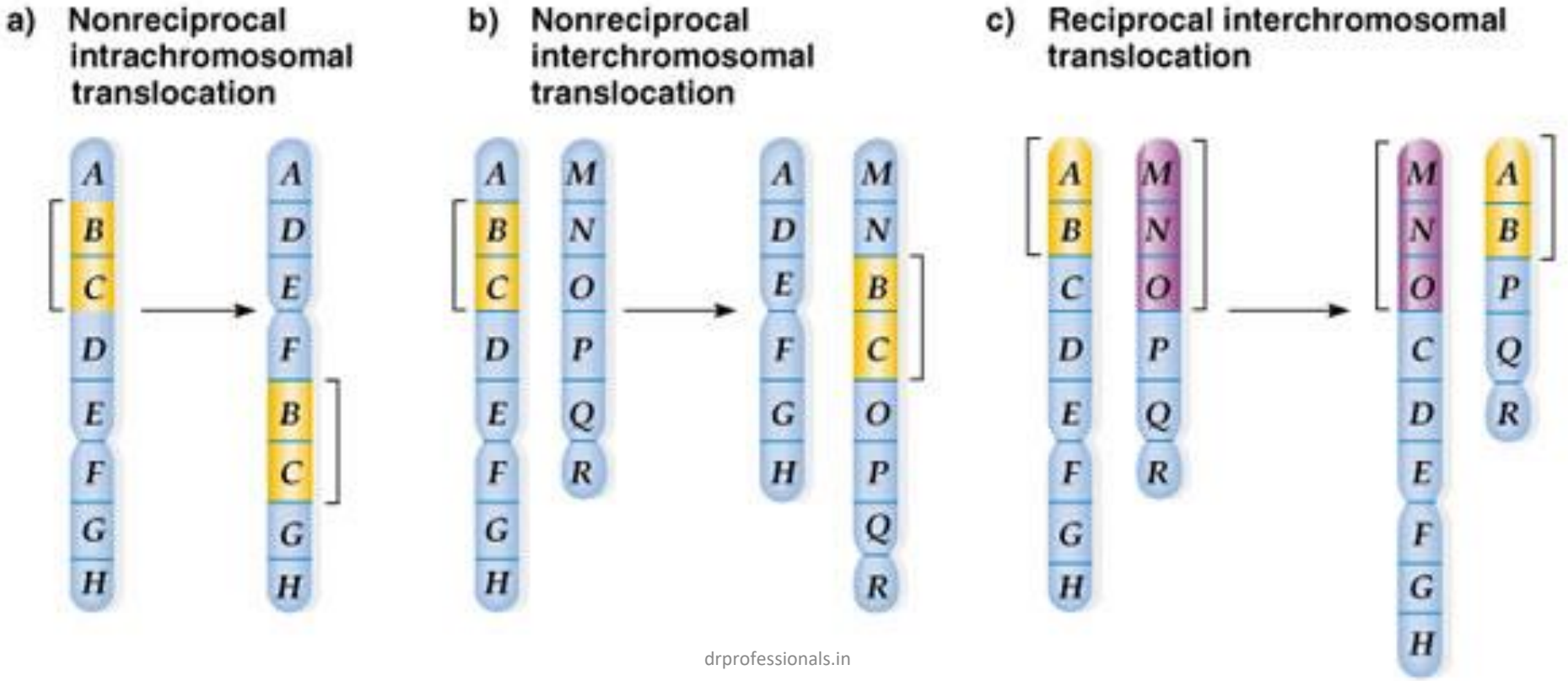
Chromosomal Inversions



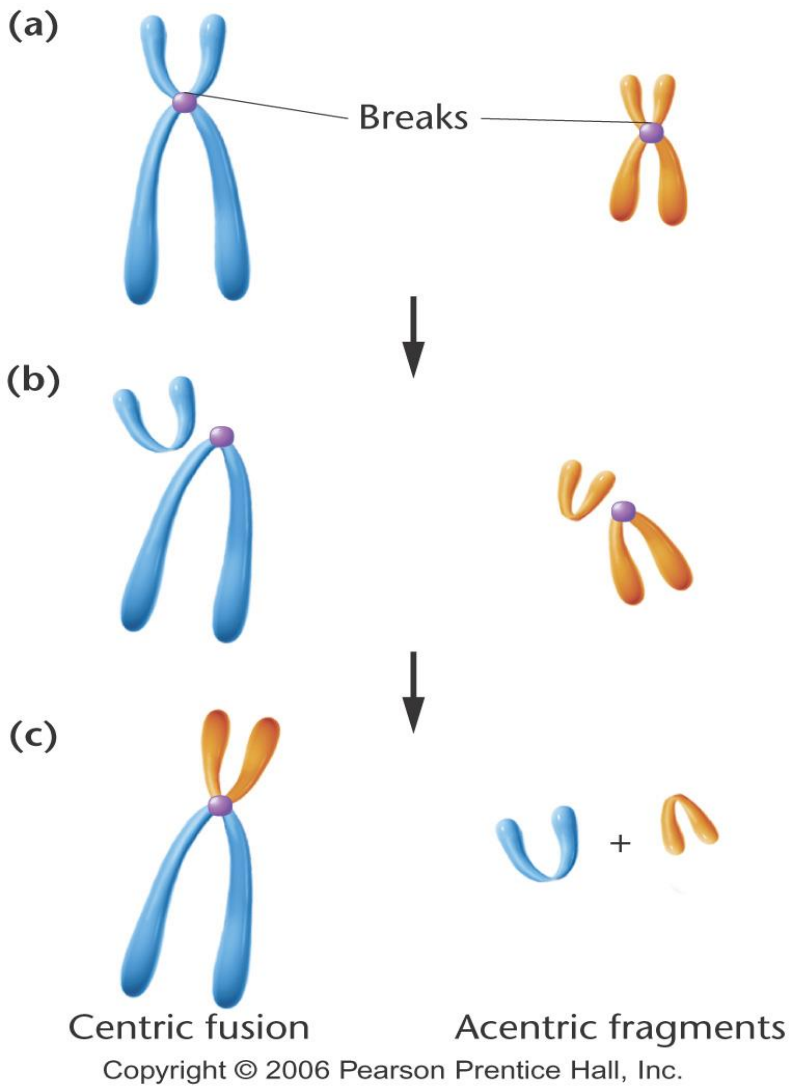
Inversions and Gametogenesis



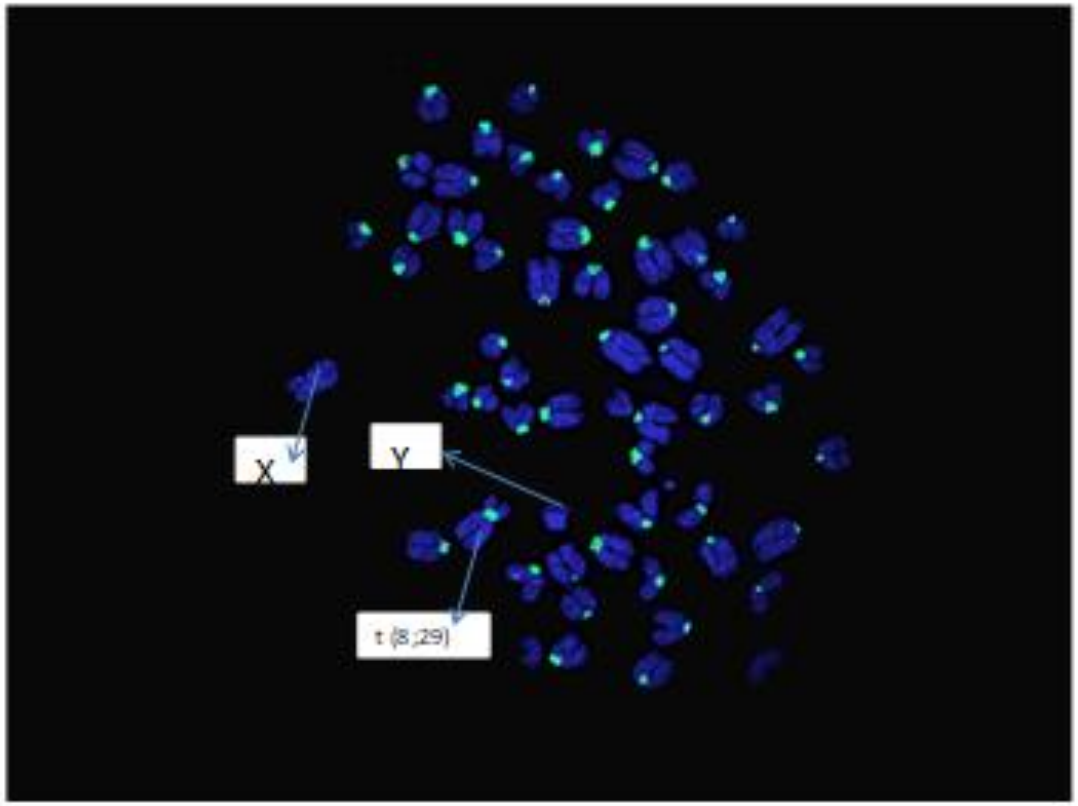
Translocations



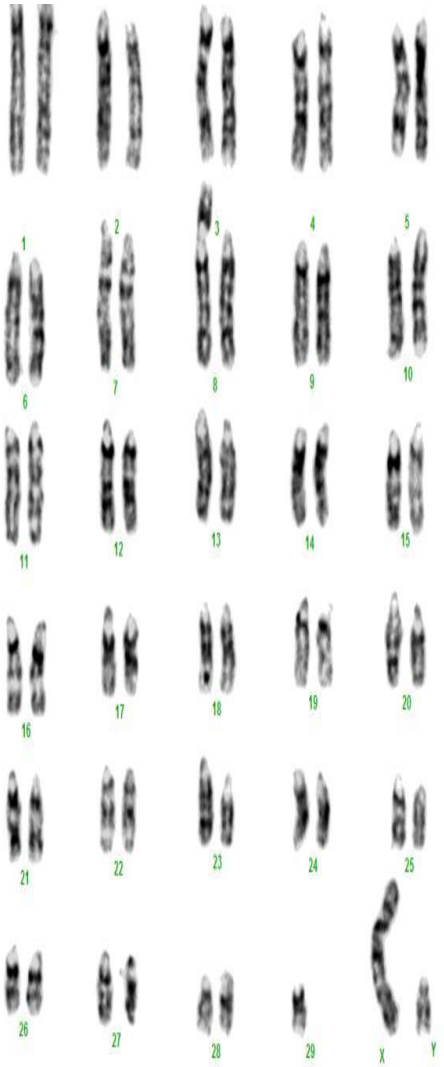
Familial Down Syndrome



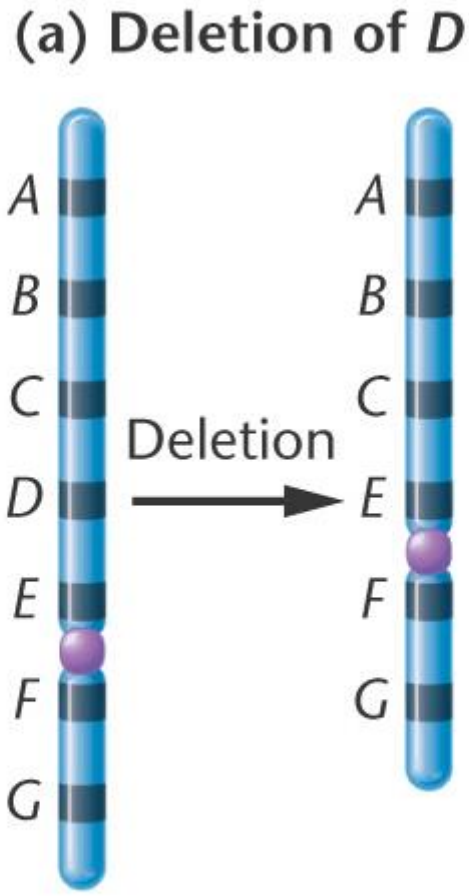
Fluorescent In-situ Hybridization

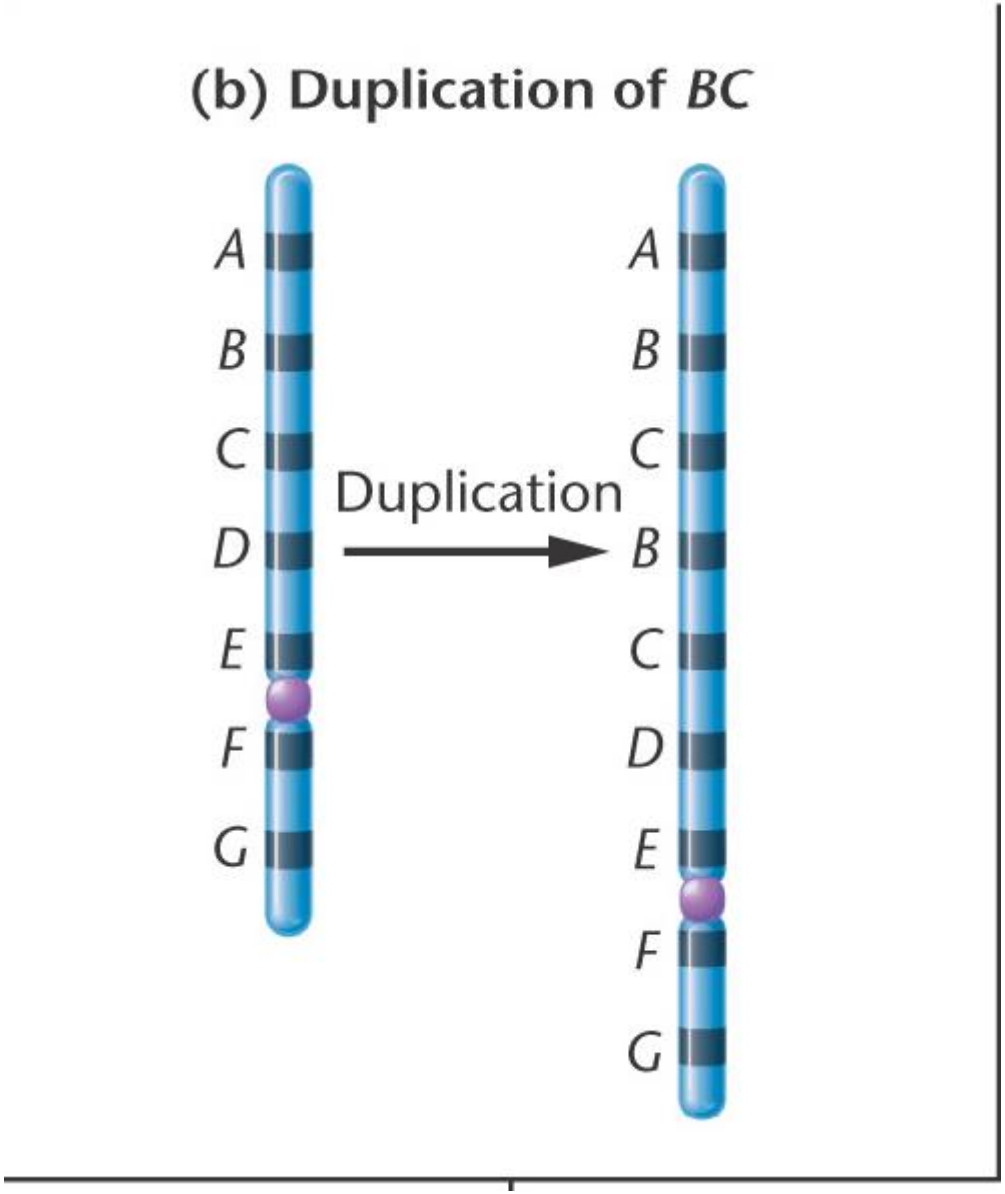


GTG- banded Karyotype of native male cattle showing 8; 29 Robertsonioan translocation

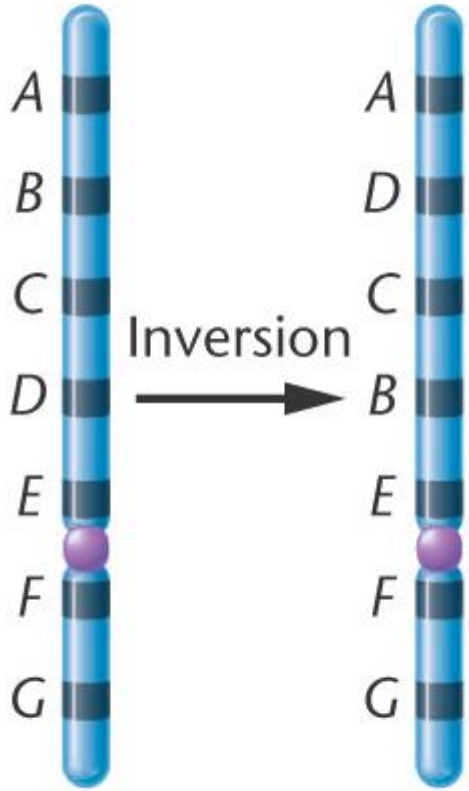


GTG- banded Karyotype of native female cattle showing 8;29 Robertsonoan translocation

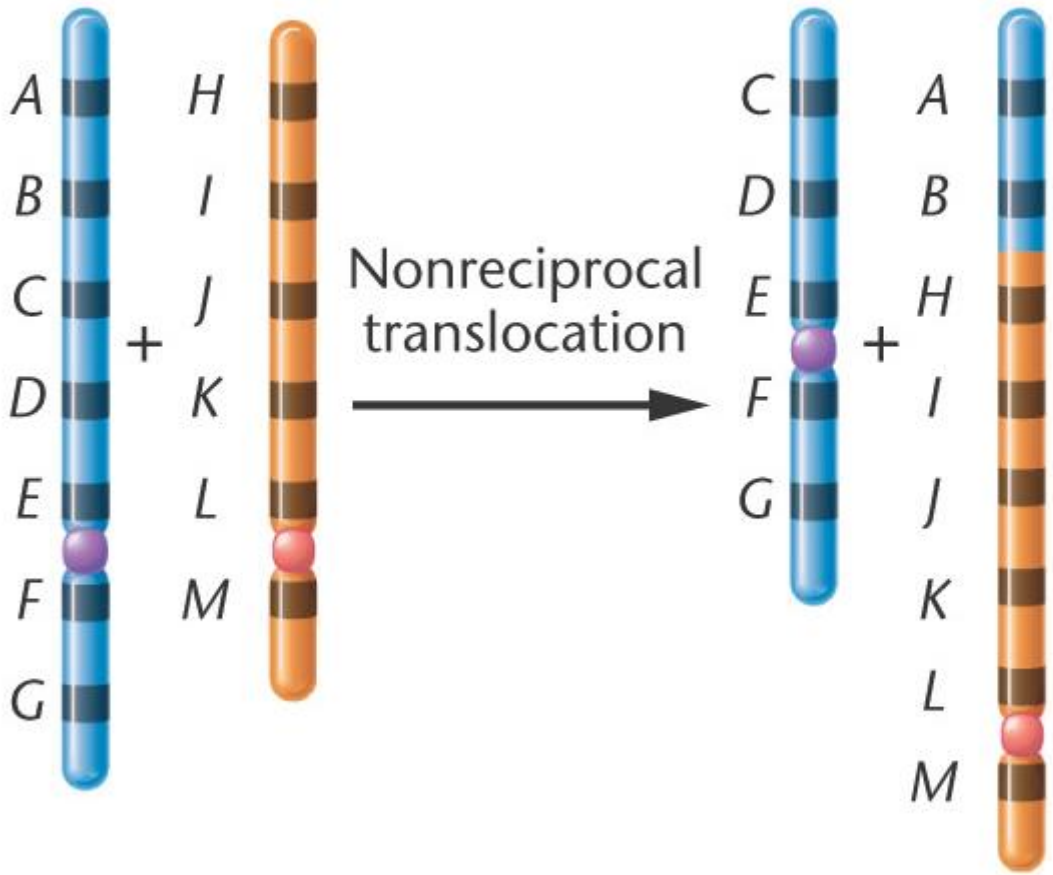




(c) Inversion of *BCD*



(d) Nonreciprocal translocation of *A–B*



(e) Reciprocal translocation of *A–B* and *H–I–J*