OUTLINE 17

VII. Mutation

A. Point Mutations

1. Substitution
2. Insertion
3. Deletion

B. Causes of Mutation

C. Consequences of Mutation

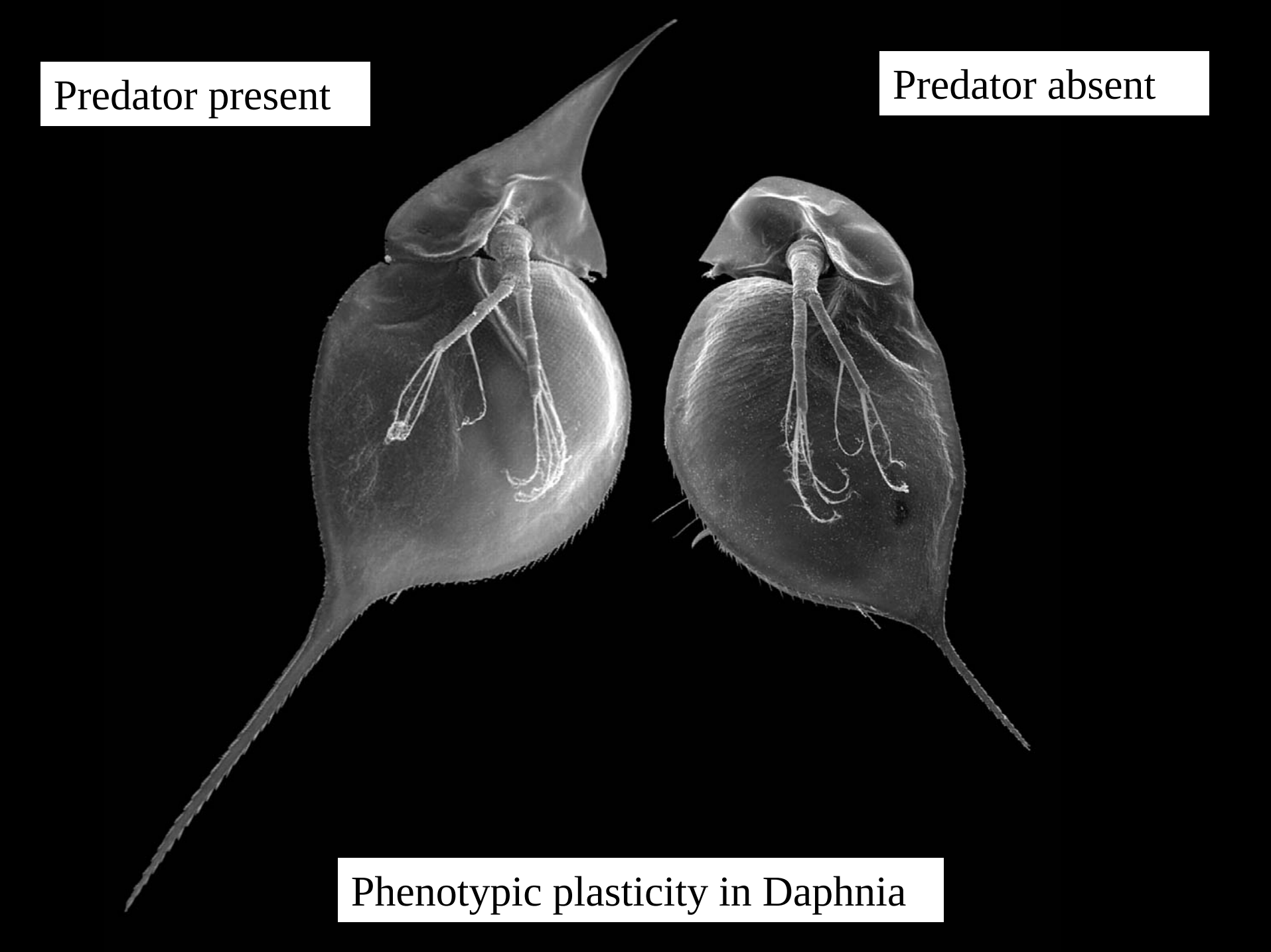
1. Beneficial
2. Neutral
3. Deleterious
4. Lethal
5. Heritable

D. Frequency of Mutations

E. Examples

F. Chromosomal abnormalities

1. Chromosome breakage
2. Aneuploidy and non-disjunction


Predator present
Predator absent
Phenotypic plasticity in Daphnia

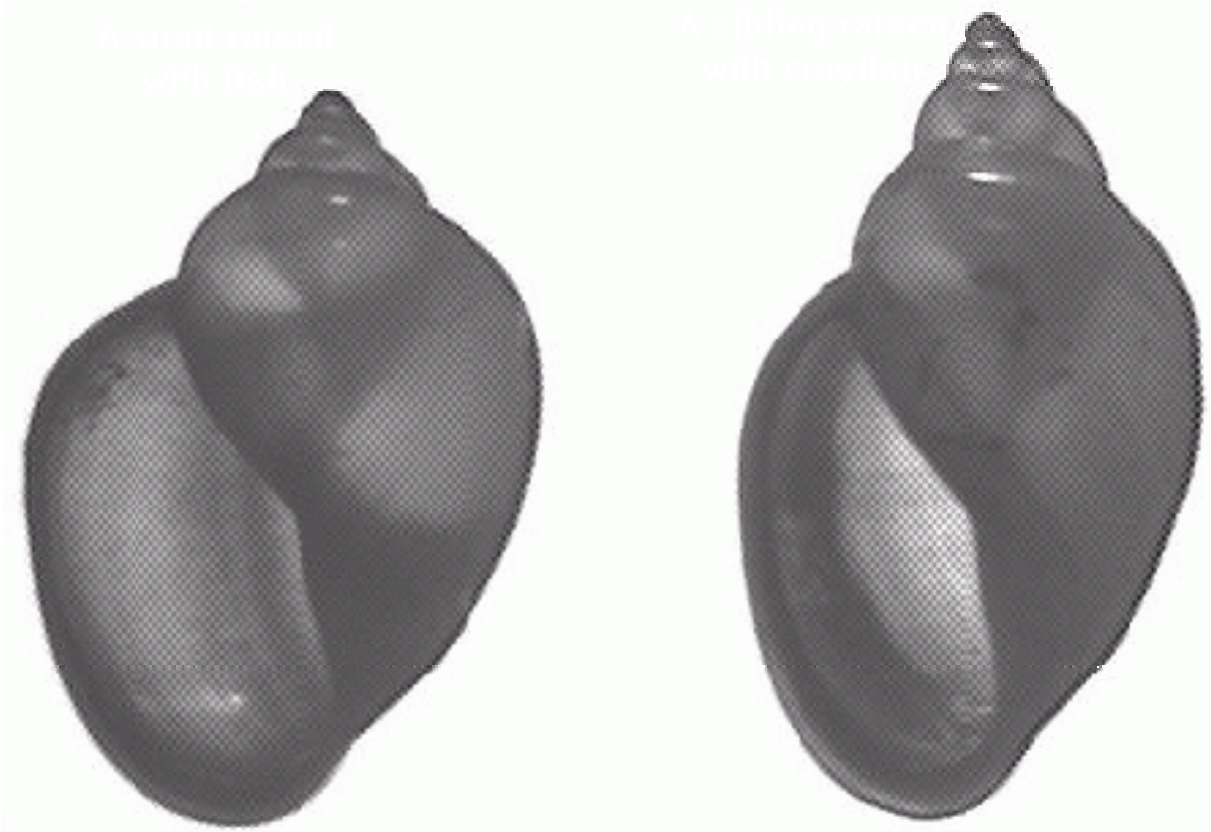
Crayfish predator

Sunfish predator

Snail prey

A snail raised with fish

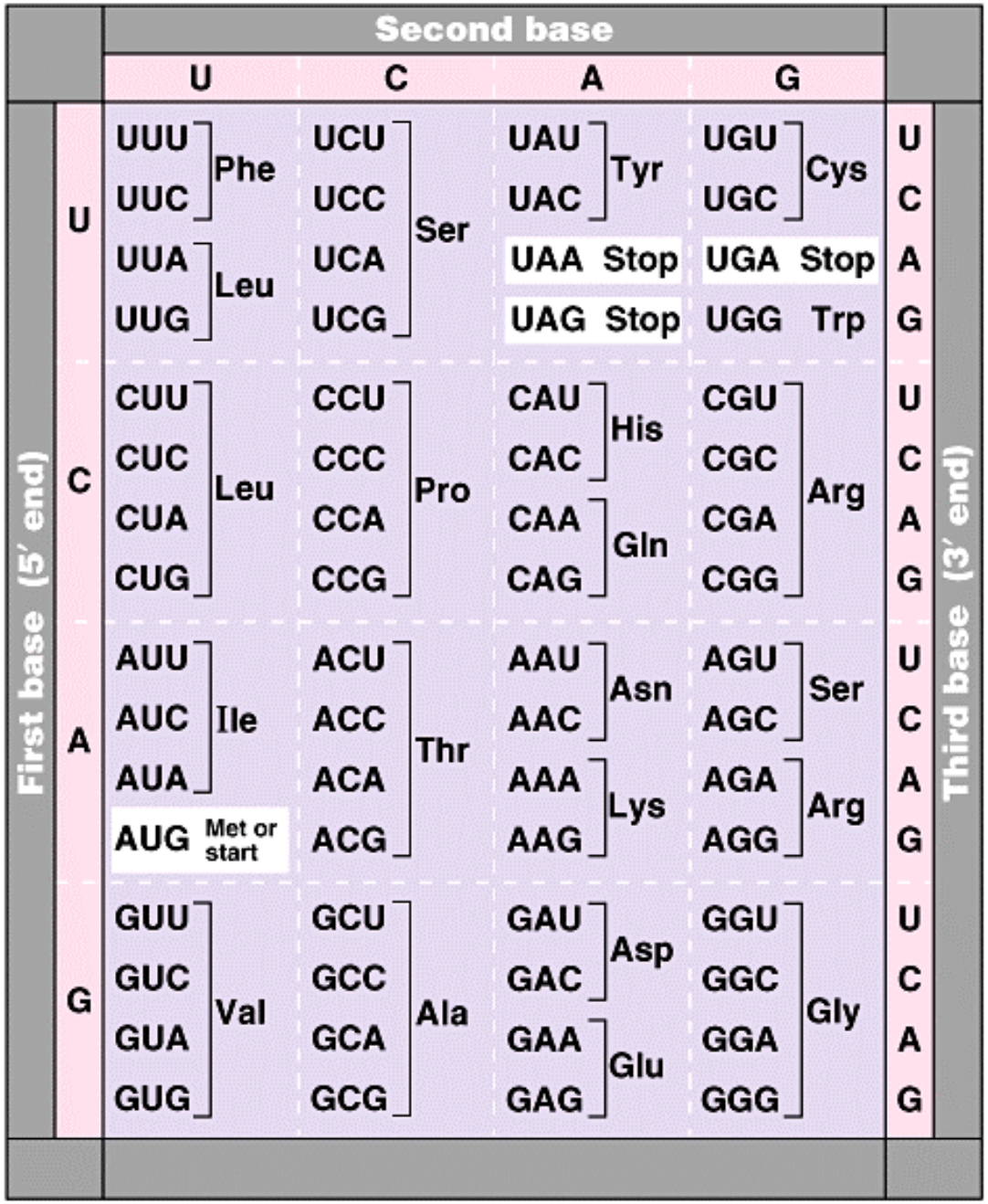
A full sib raised with crayfish



Phenotypic plasticity in shell morphology in *Physis*


M
Erbgutverändernd

The genetic code

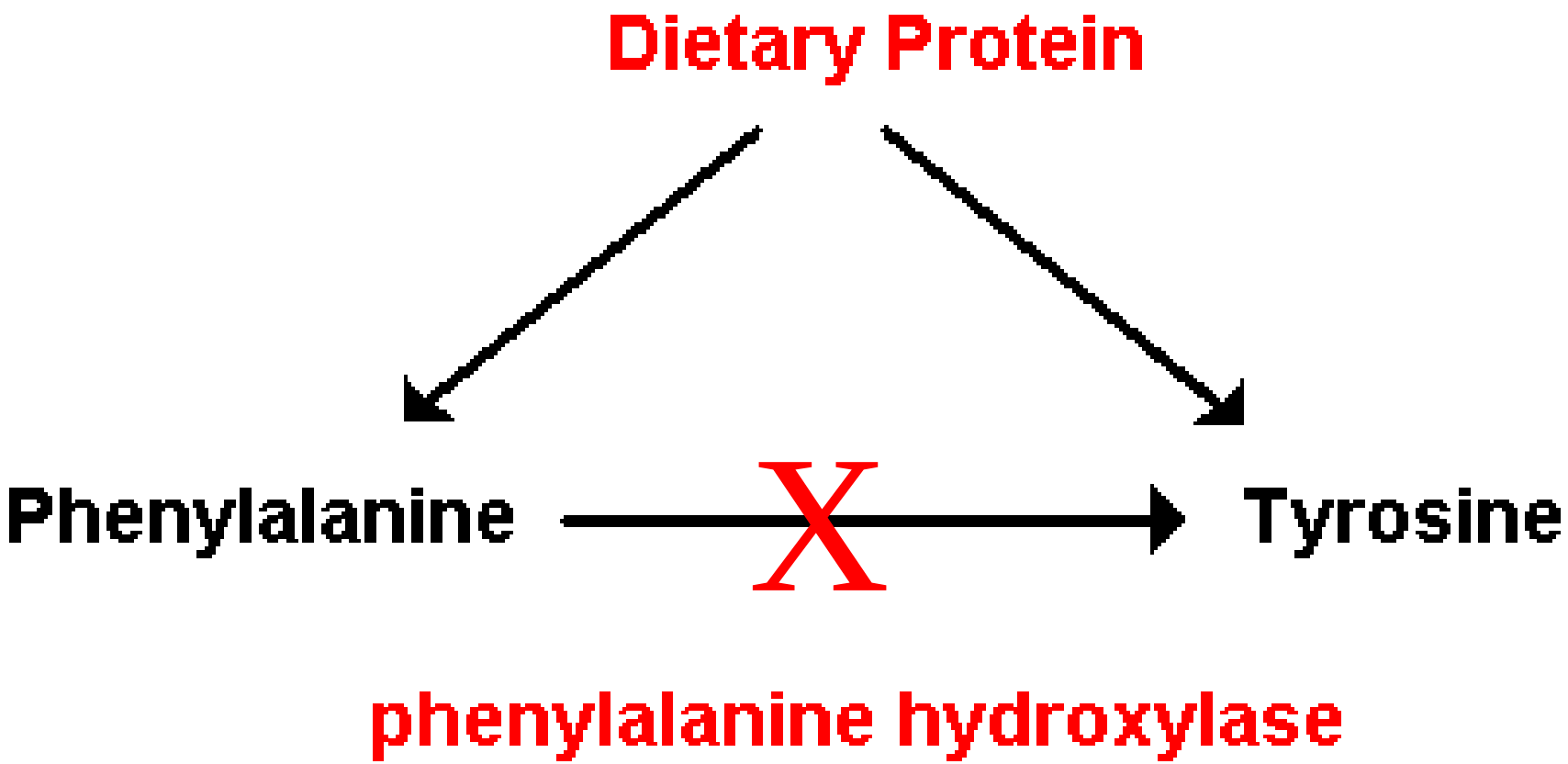


Consequences of a frame shift mutation:

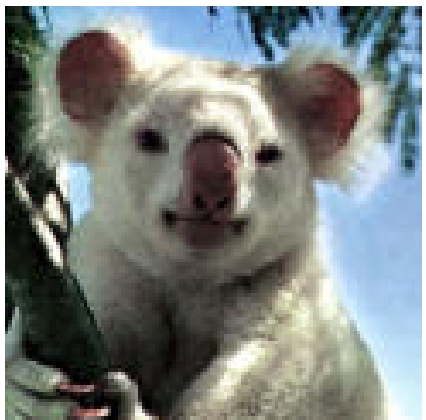
THE BIG CAT ATE THE RED EGG

THB IGC ATA TET HER EDE GG. …

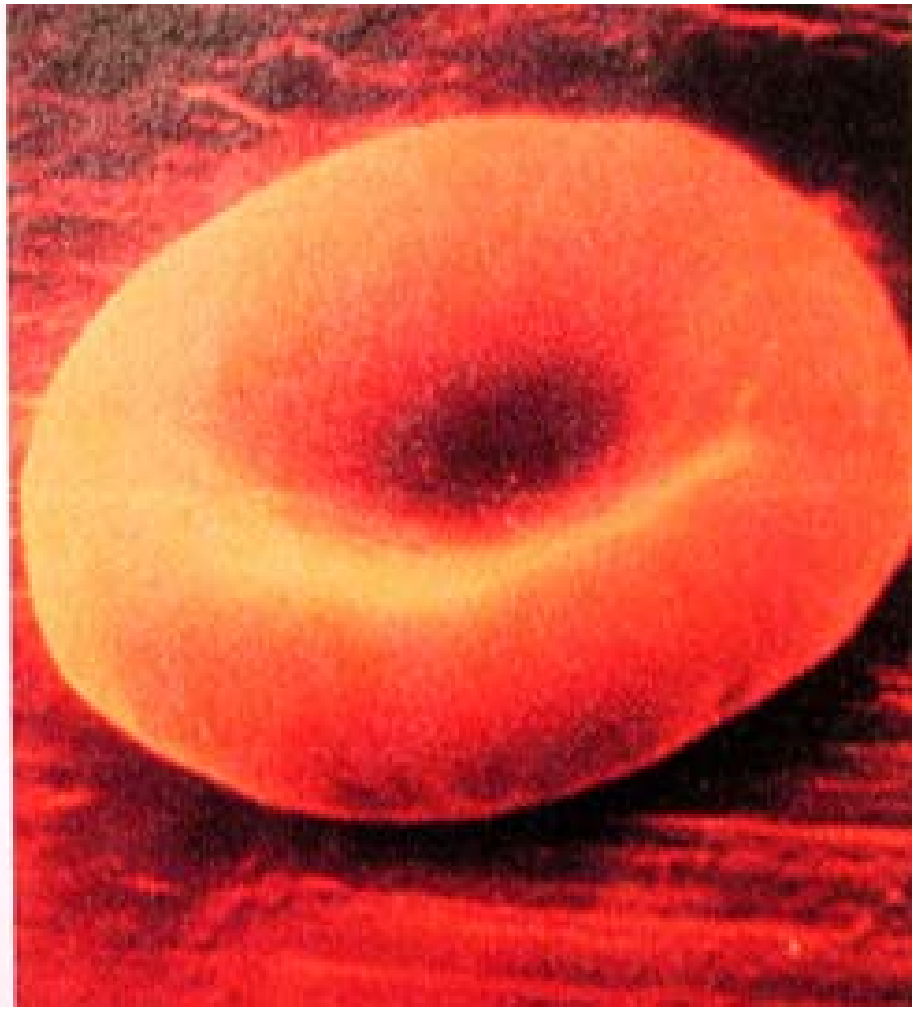
PKU disease - an autosomal recessive trait



Albinism



Sickle cell



Normal red blood cell

Sickle cell anemia: an autosomal co-dominant

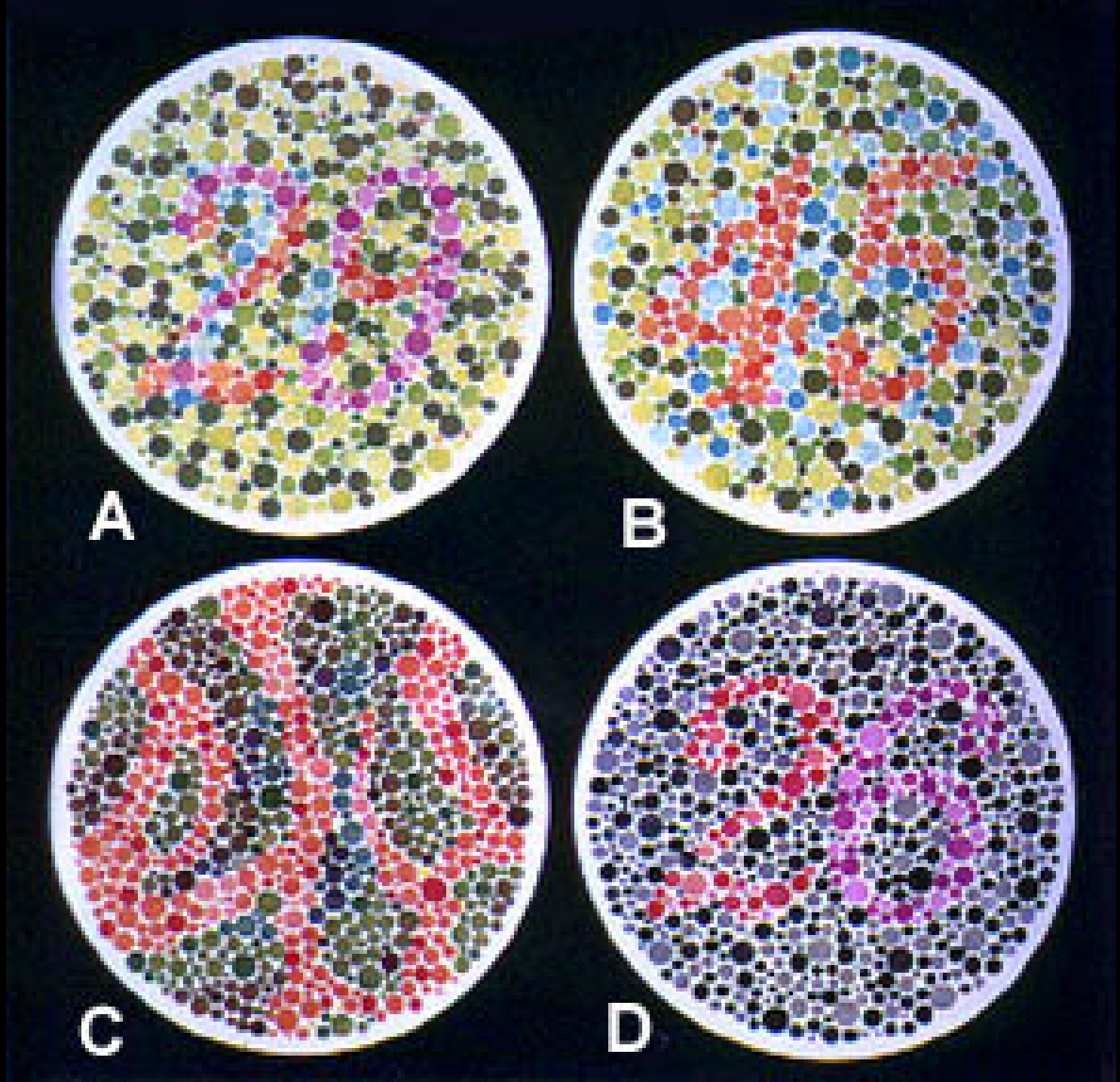
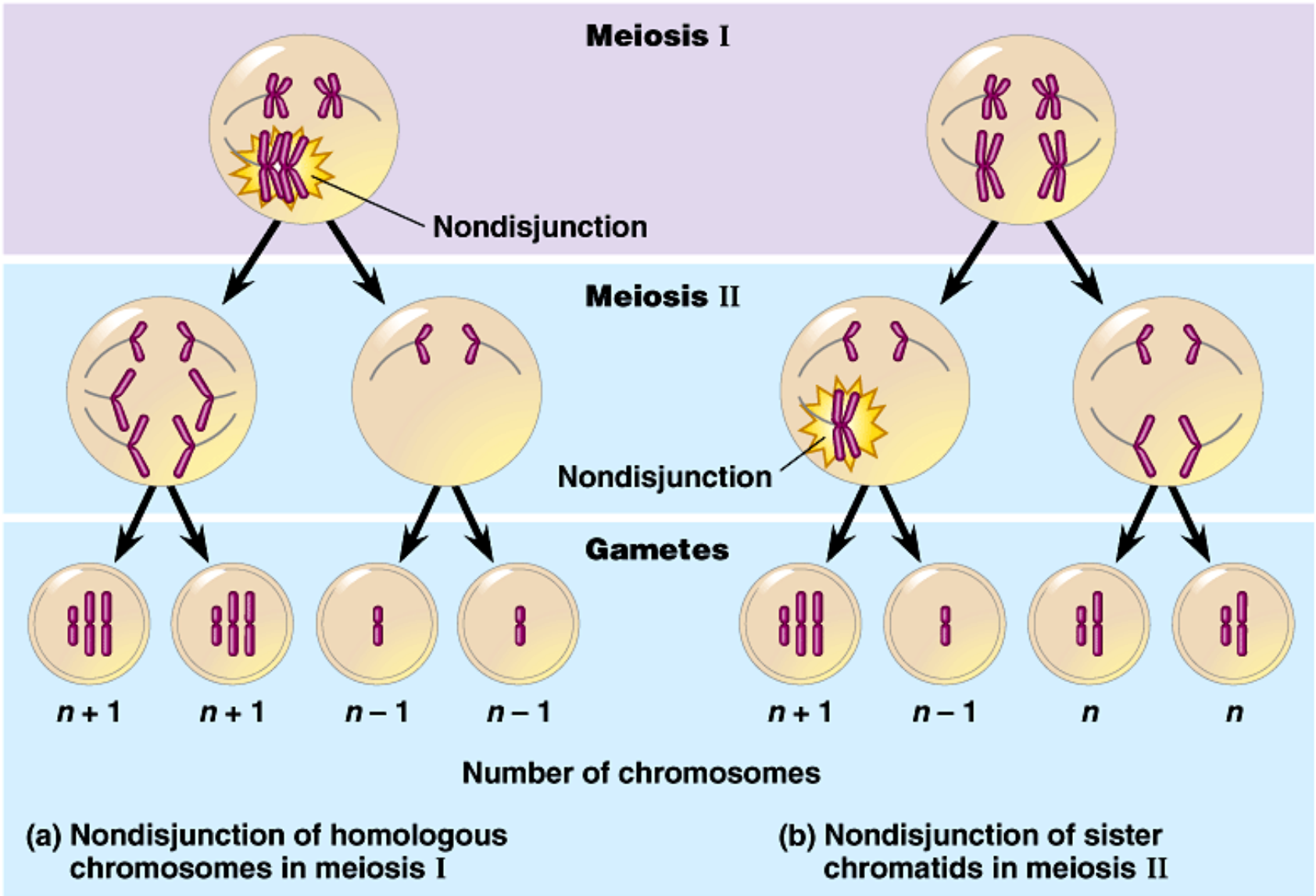
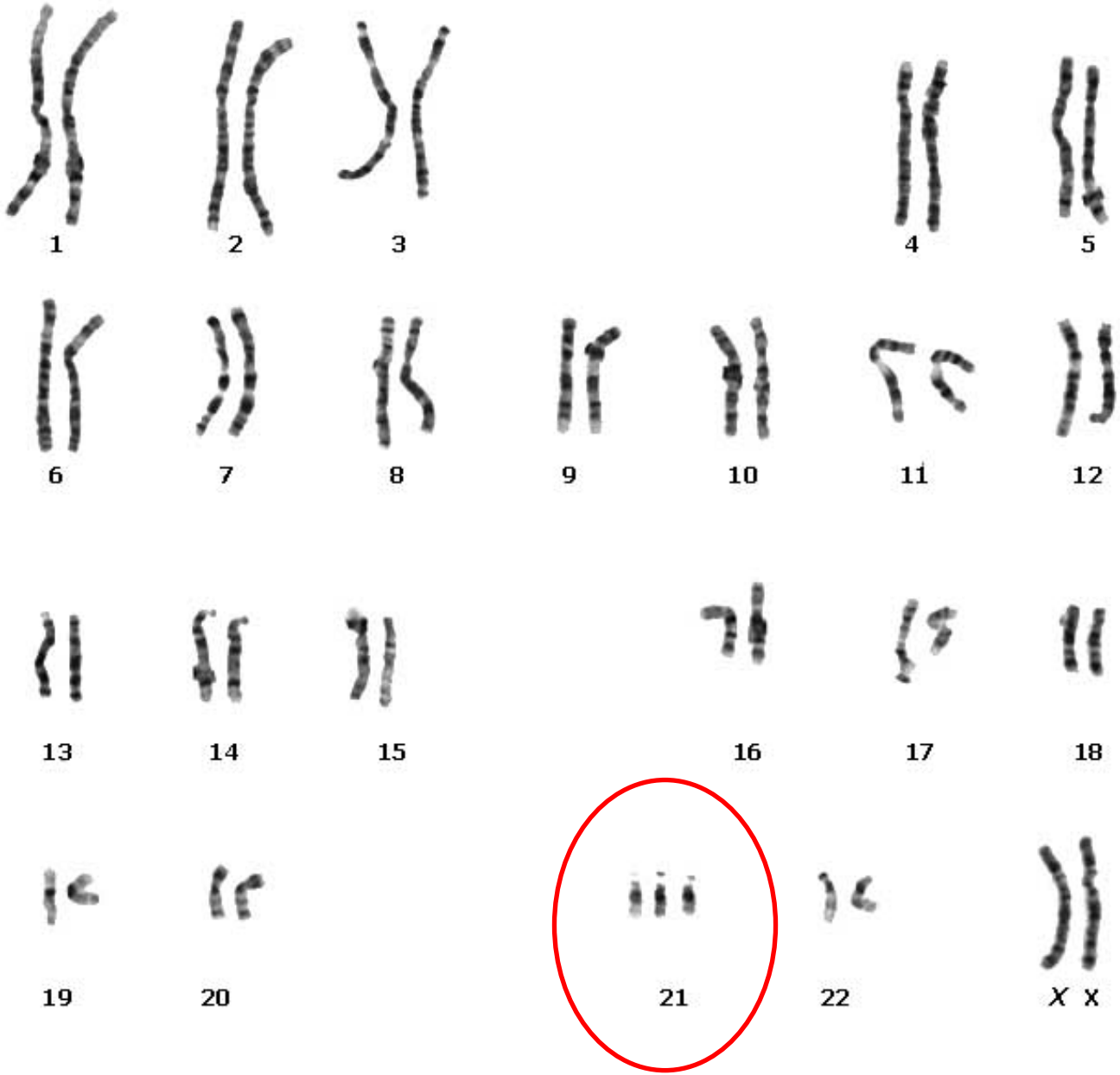
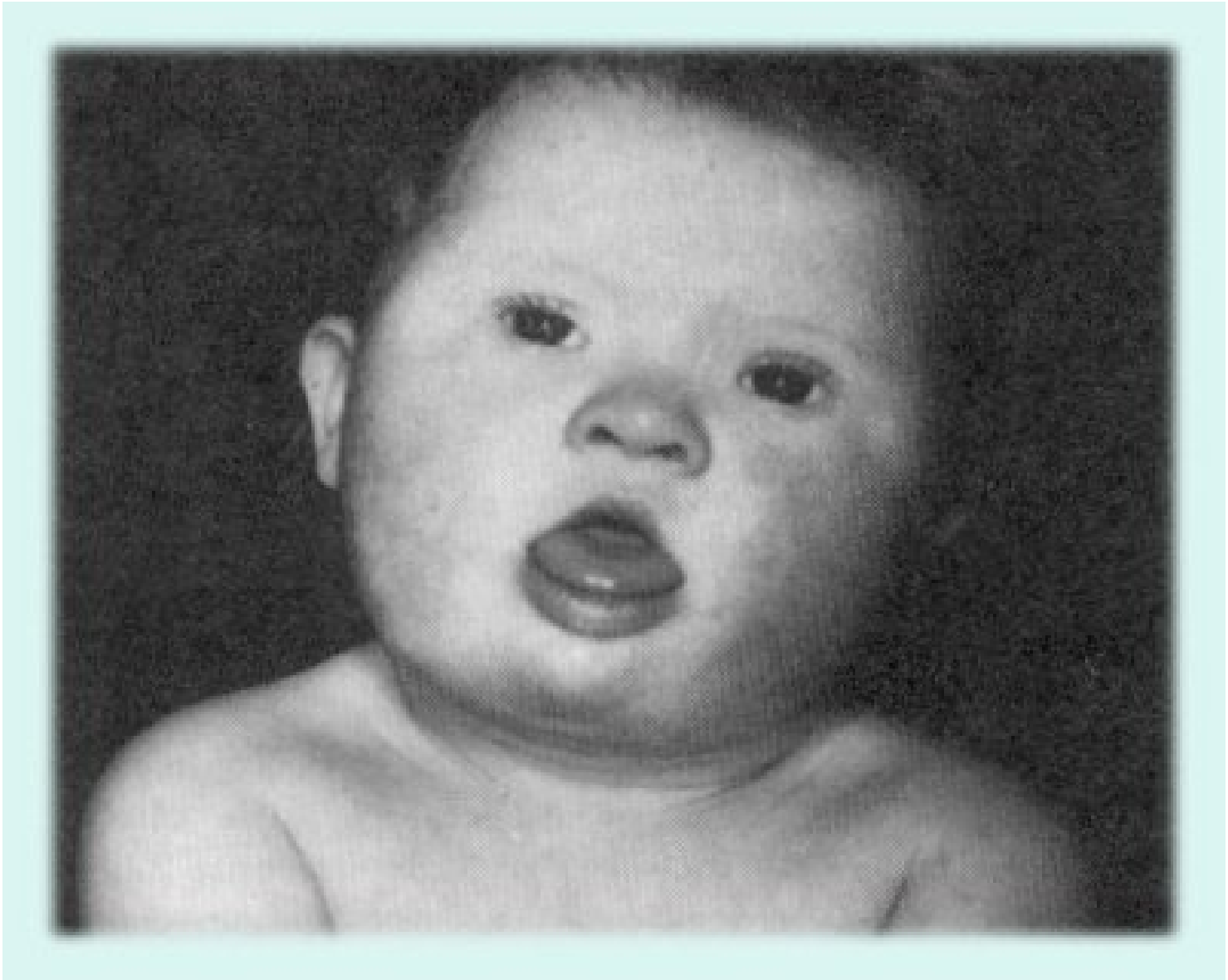

A
B
C
D

Fig. 15.11: Non-disjunction leading to aneuploid gametes

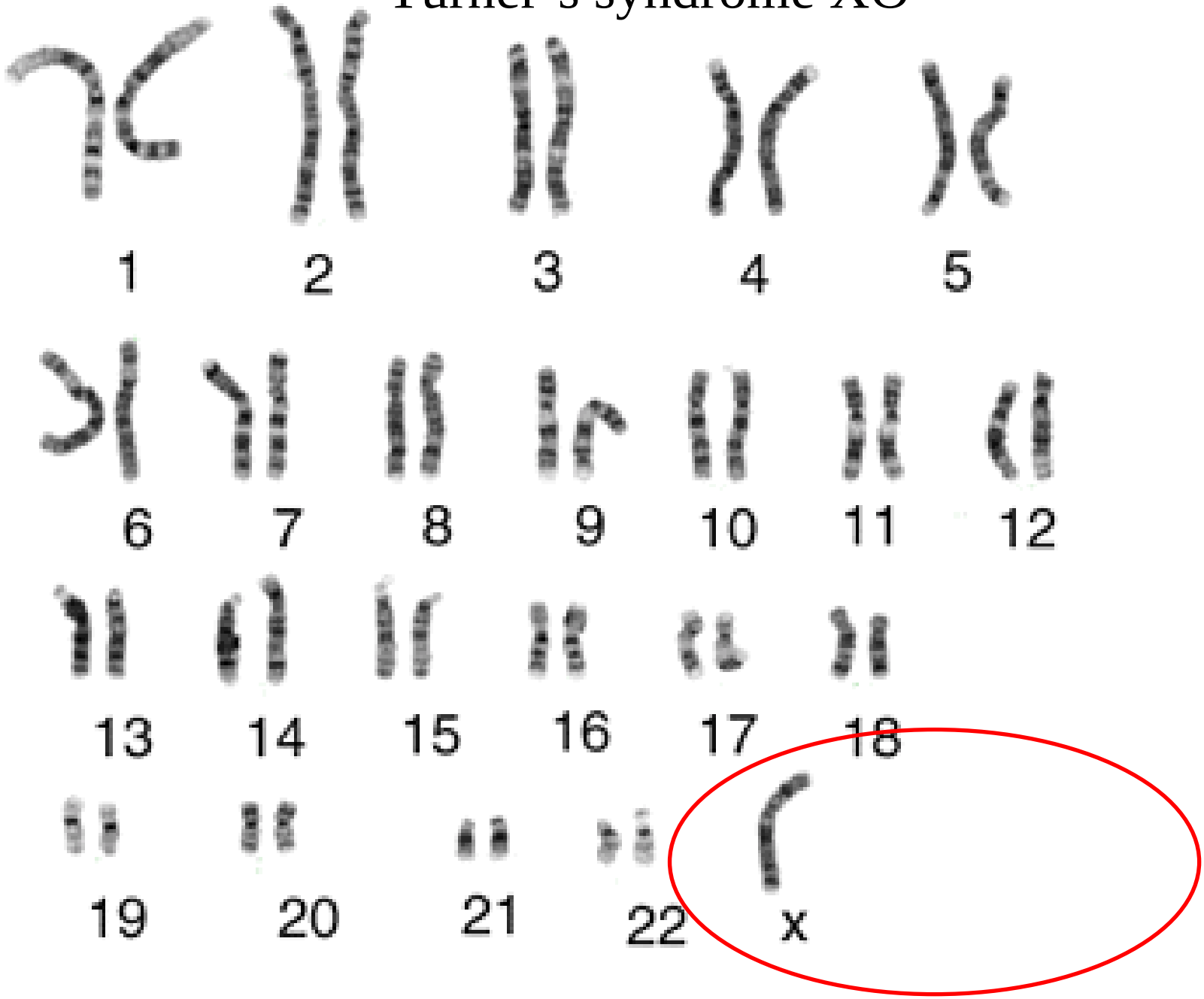


Trisomy 21

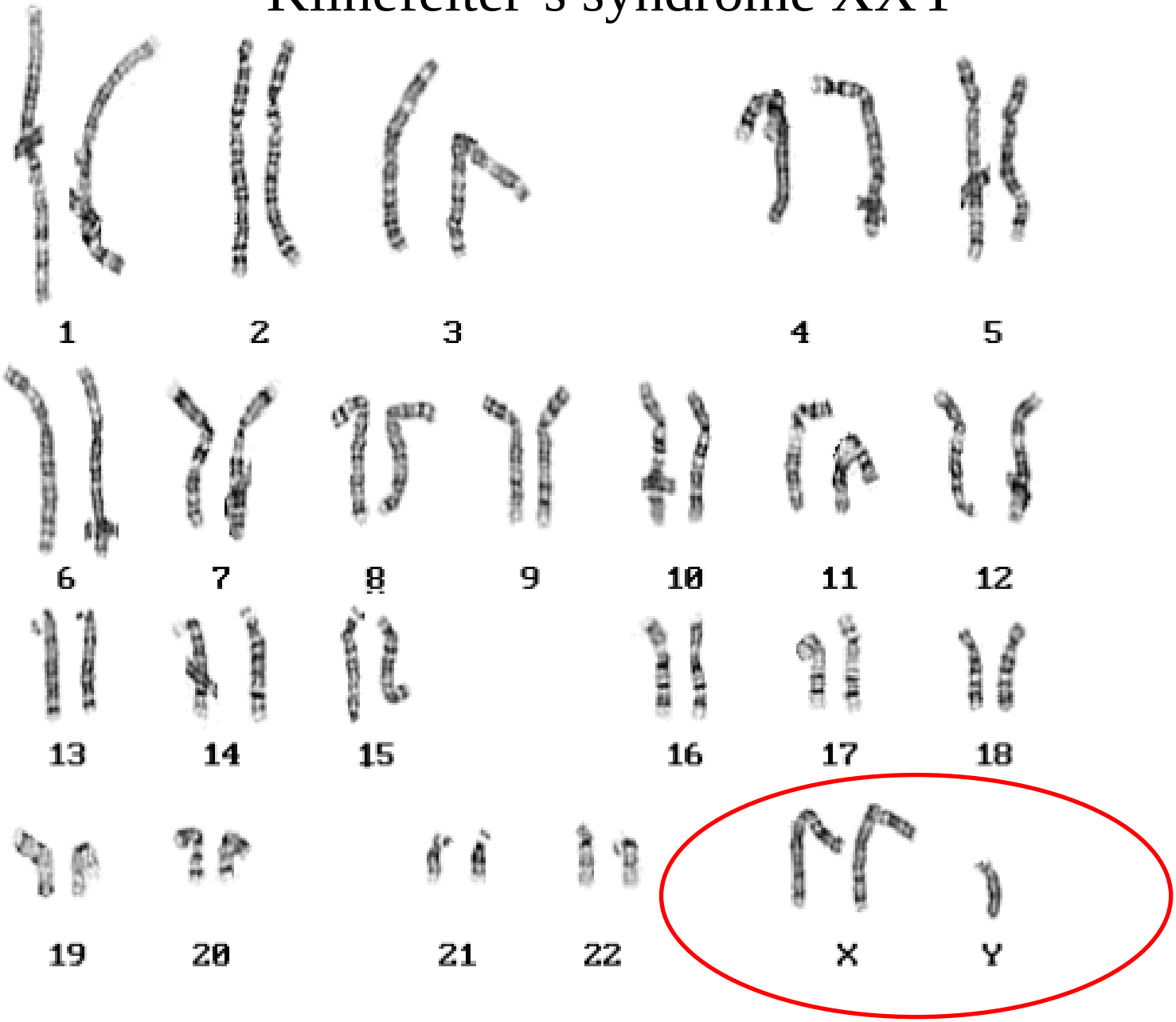




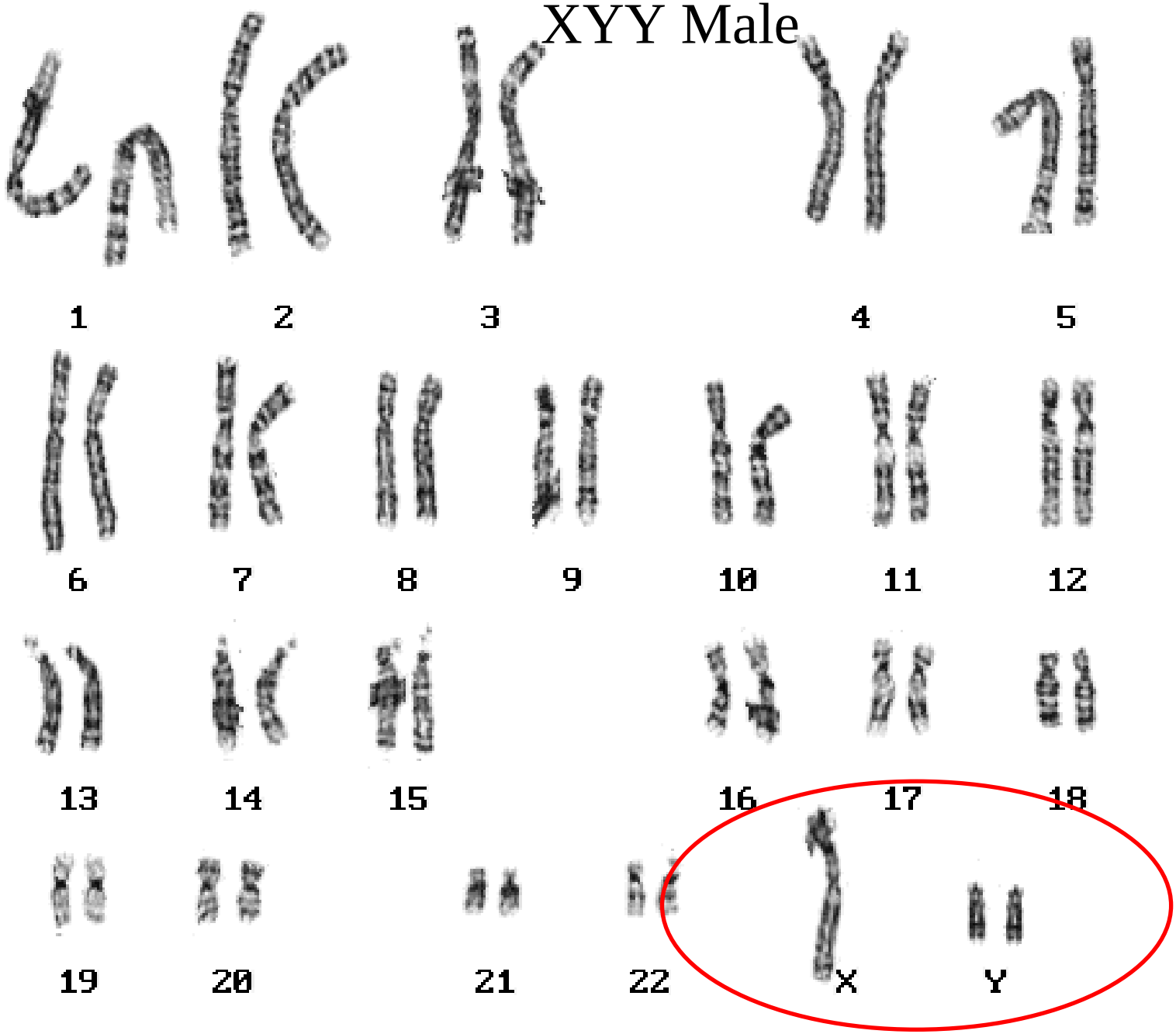
Turner's syndrome XO



Klinefelter's syndrome XXY



XYY Male



Cri du chat

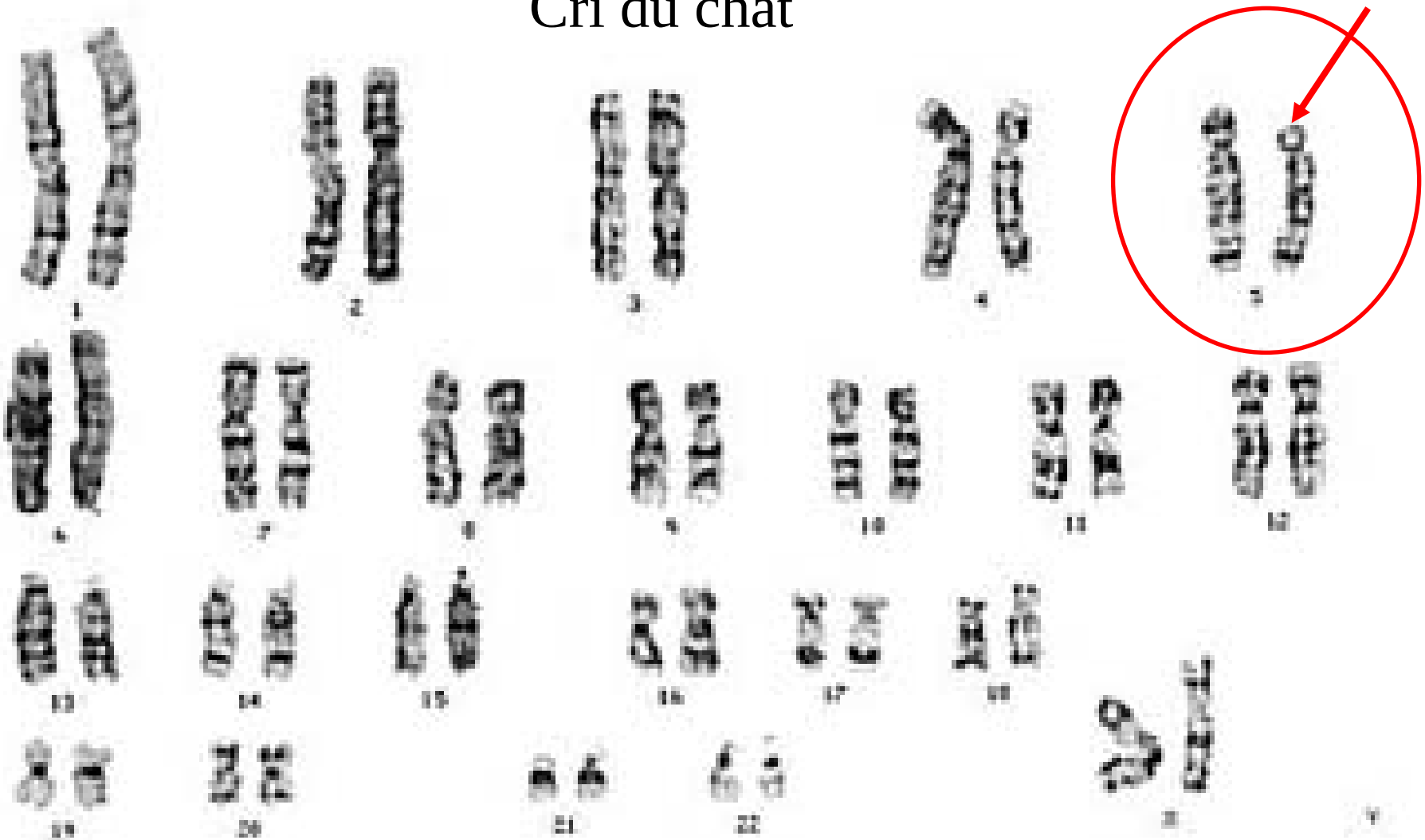
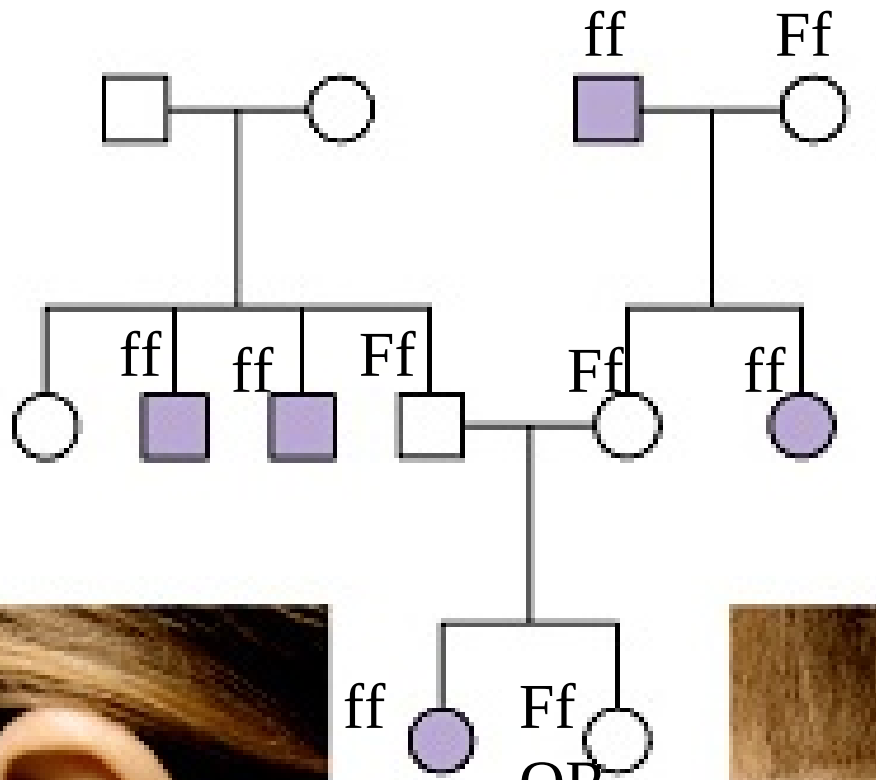


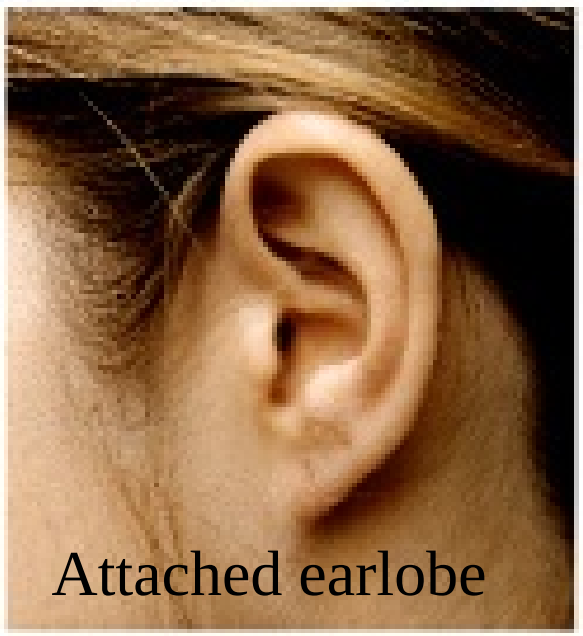
Fig 14.14 Use of pedigree analysis

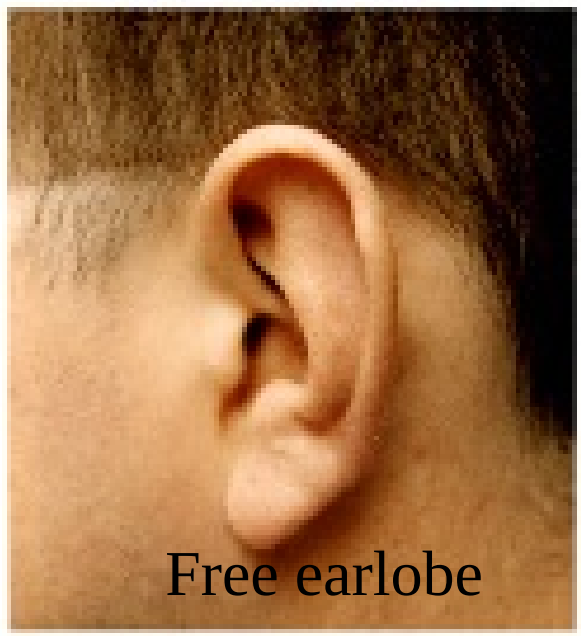


= male

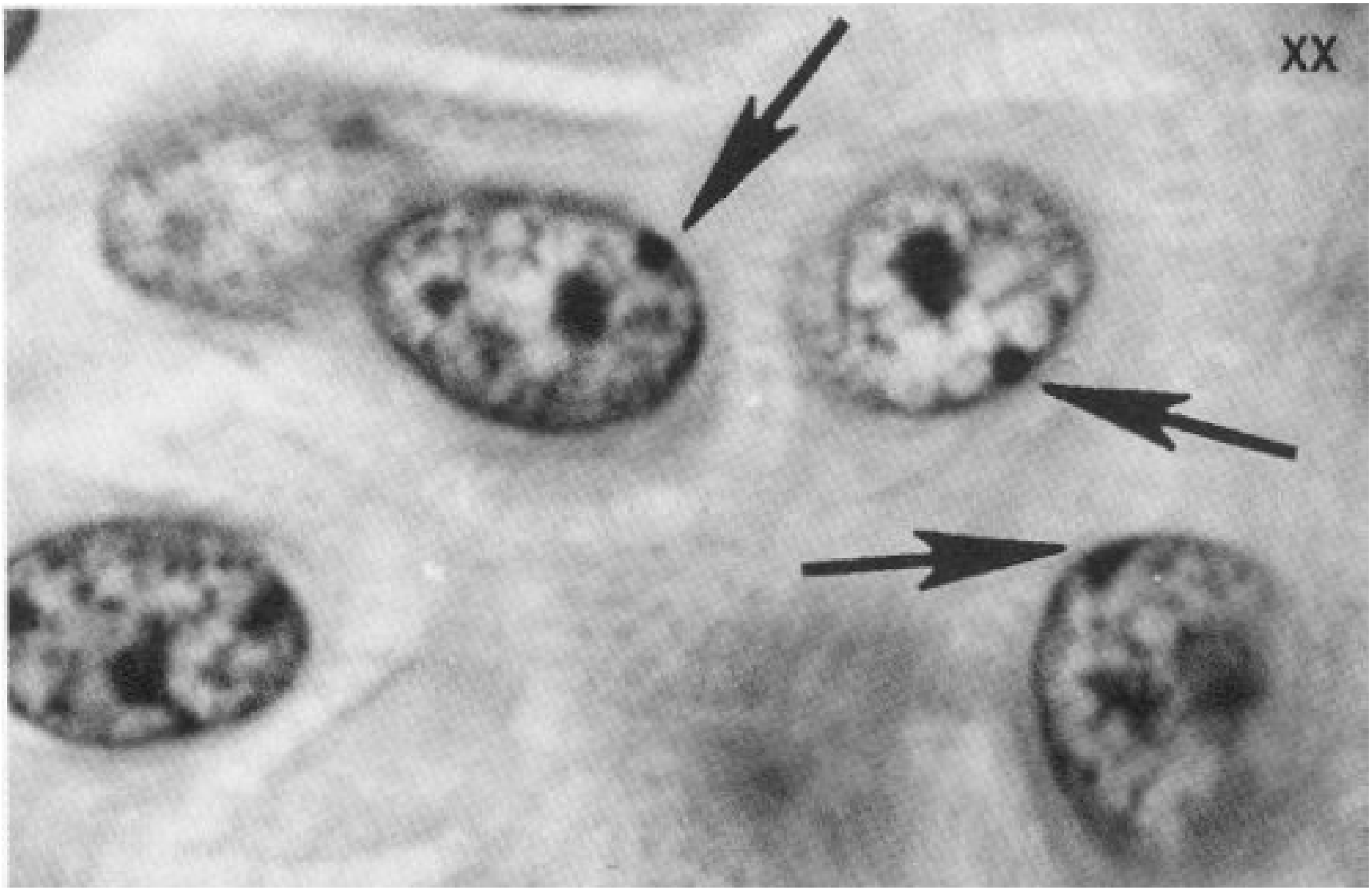
= female

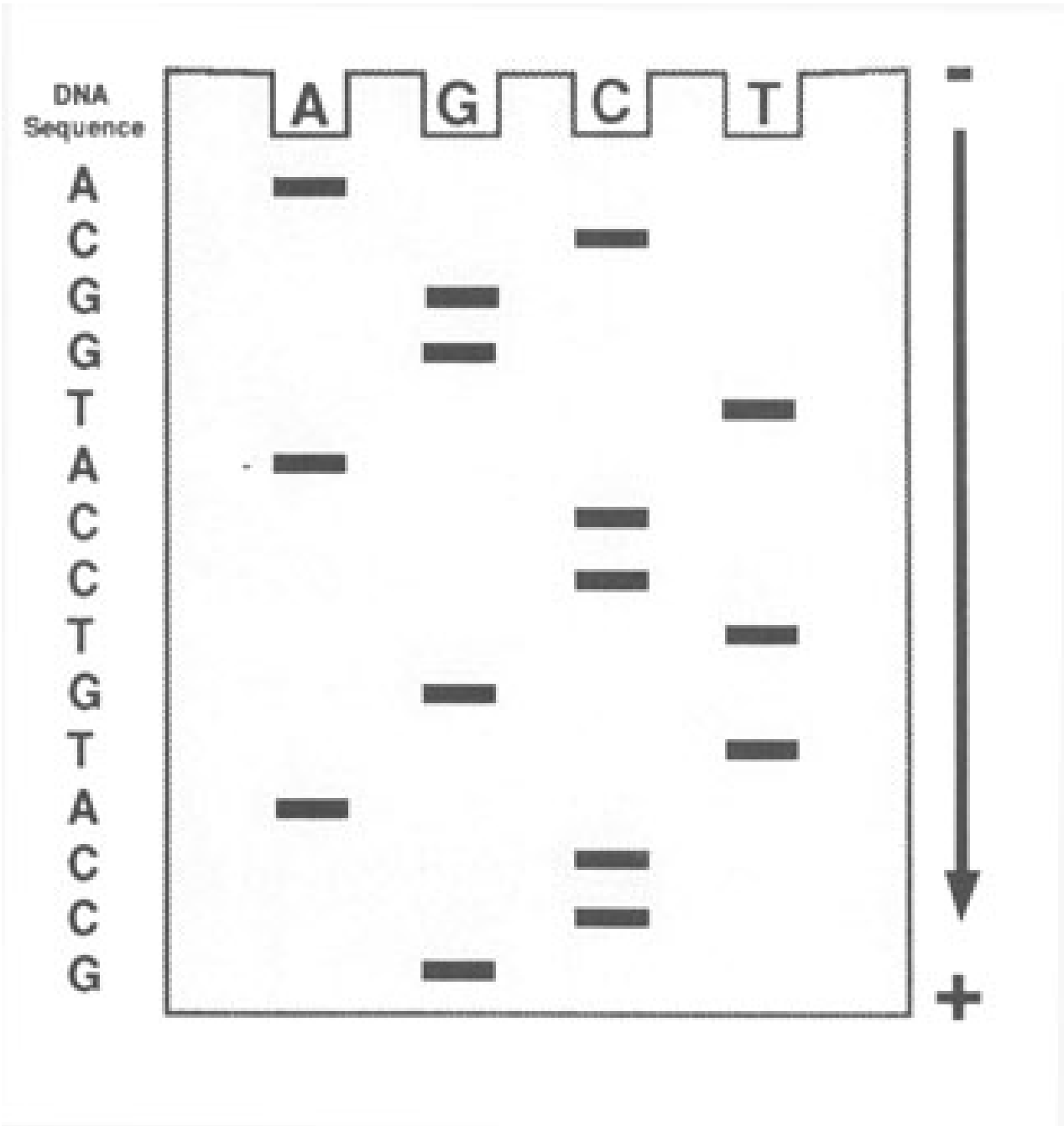
= attached





Sex chromatin: Barr body




DNA Sequence
A
C
G
G
T
A
C
C
T
G
T
A
C
C
G
A
G
C
T
-
+