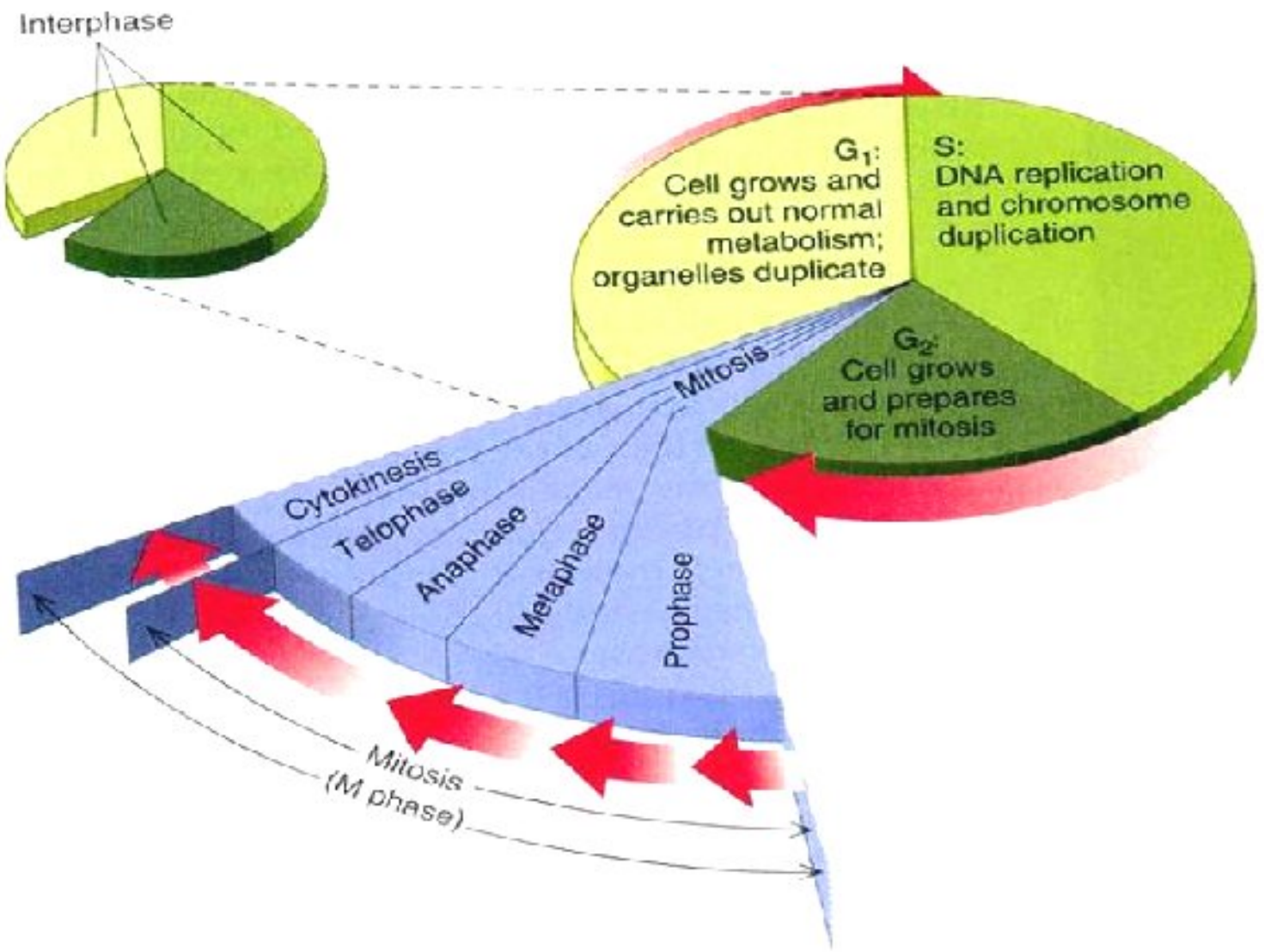
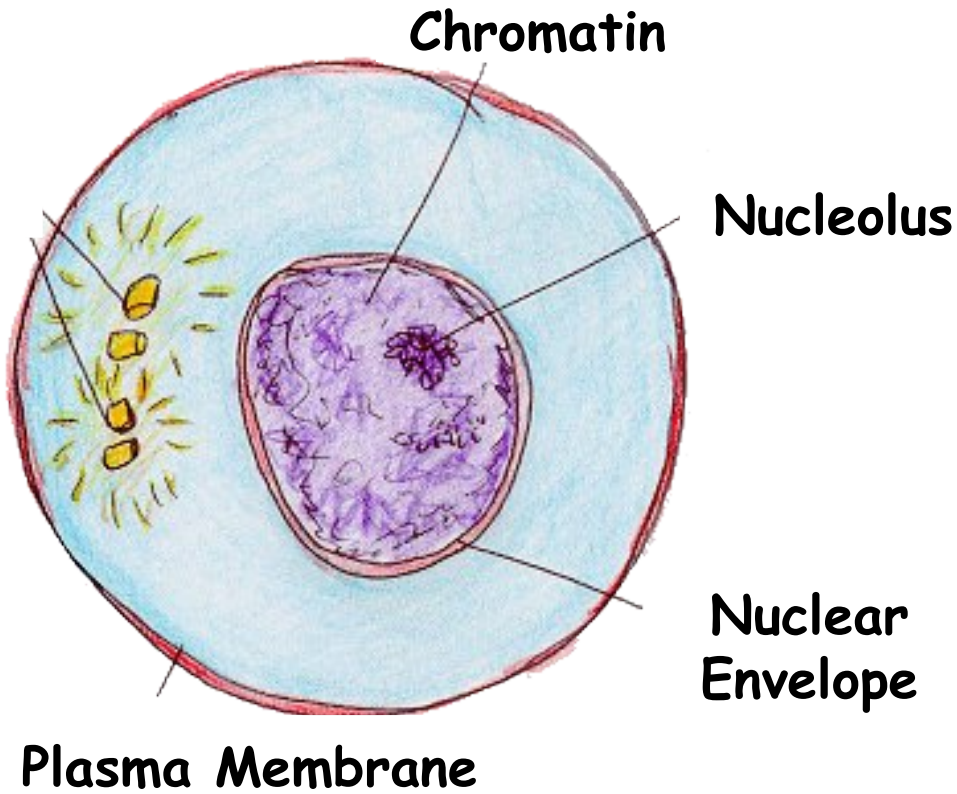
MITOSIS, HUMAN KARYOTYPE

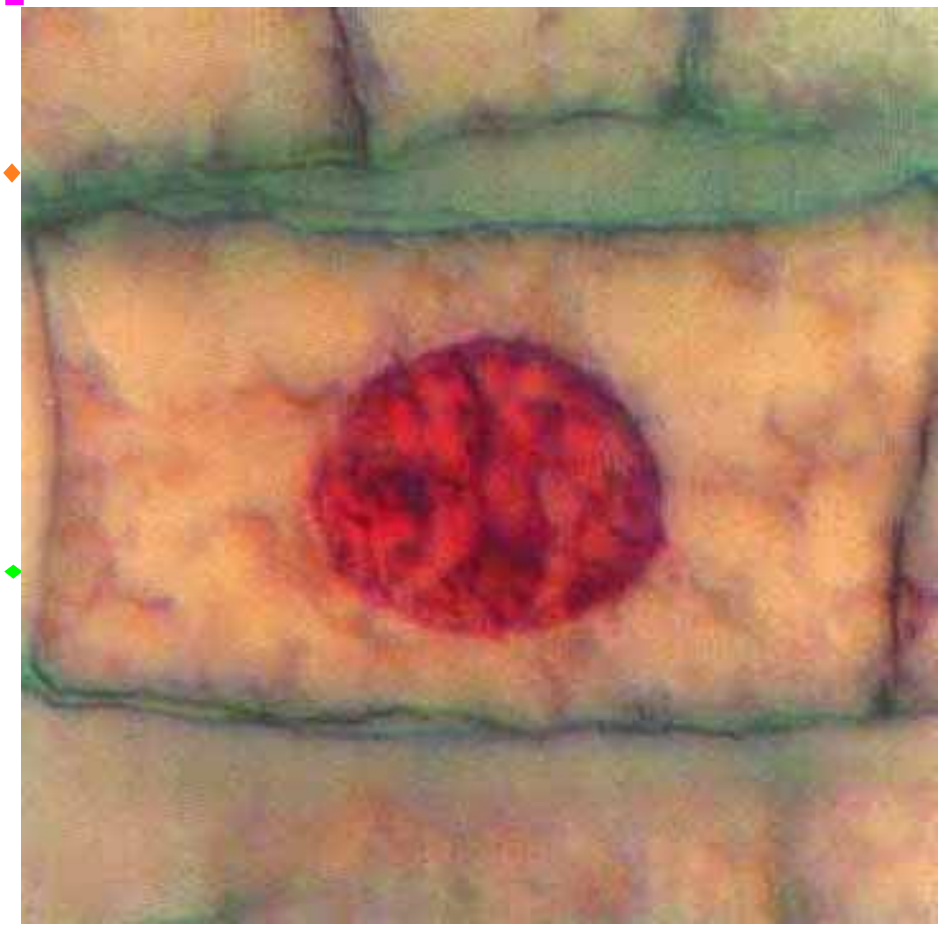
CELL CYCLE

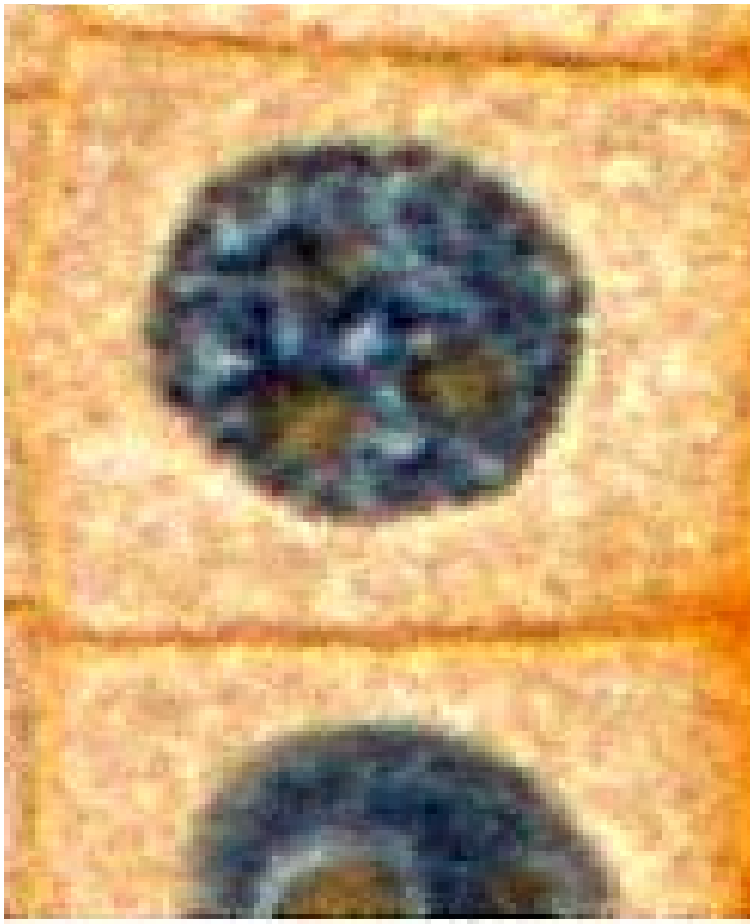

Interphase
G1:
Cell grows and carries out normal metabolism; organelles duplicate
S:
DNA replication and chromosome duplication
G2:
Cell grows and prepares for mitosis
Mitosis
Prophase
Metaphase
Anaphase
Telophase
Cytokinesis
Mitosis
(M phase)

INTERPHASE

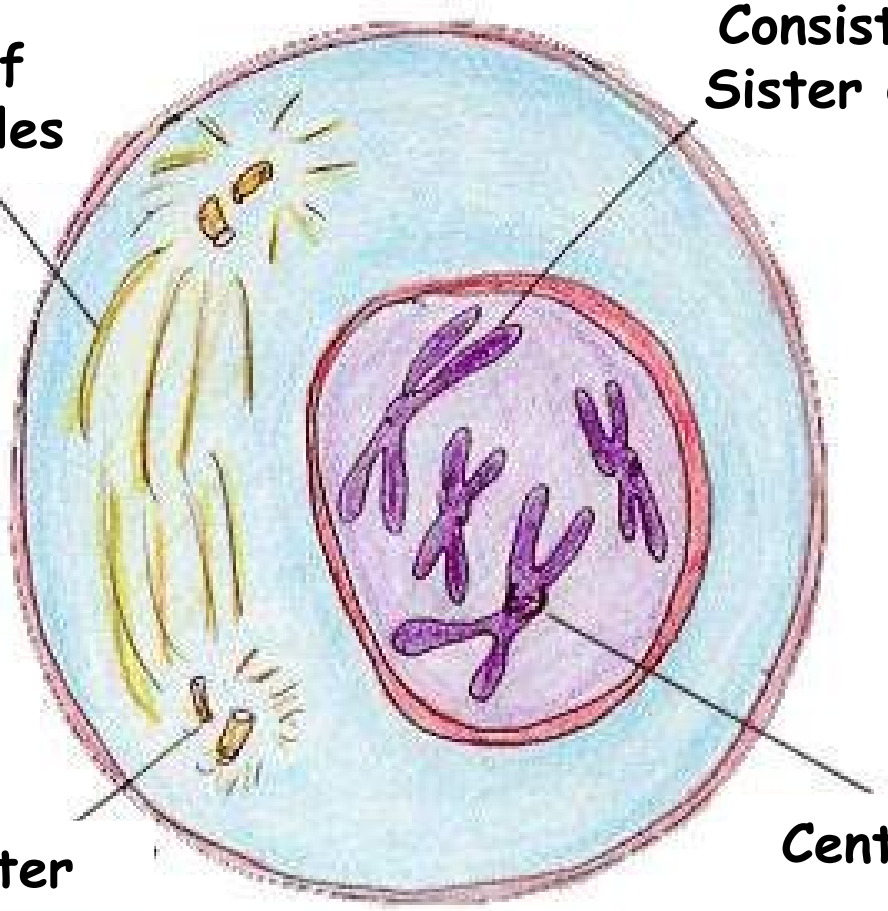

Chromatin
Centrioles
Two Pairs
Nucleolus
Nuclear
Envelope
Plasma Membrane

INTERPHASE

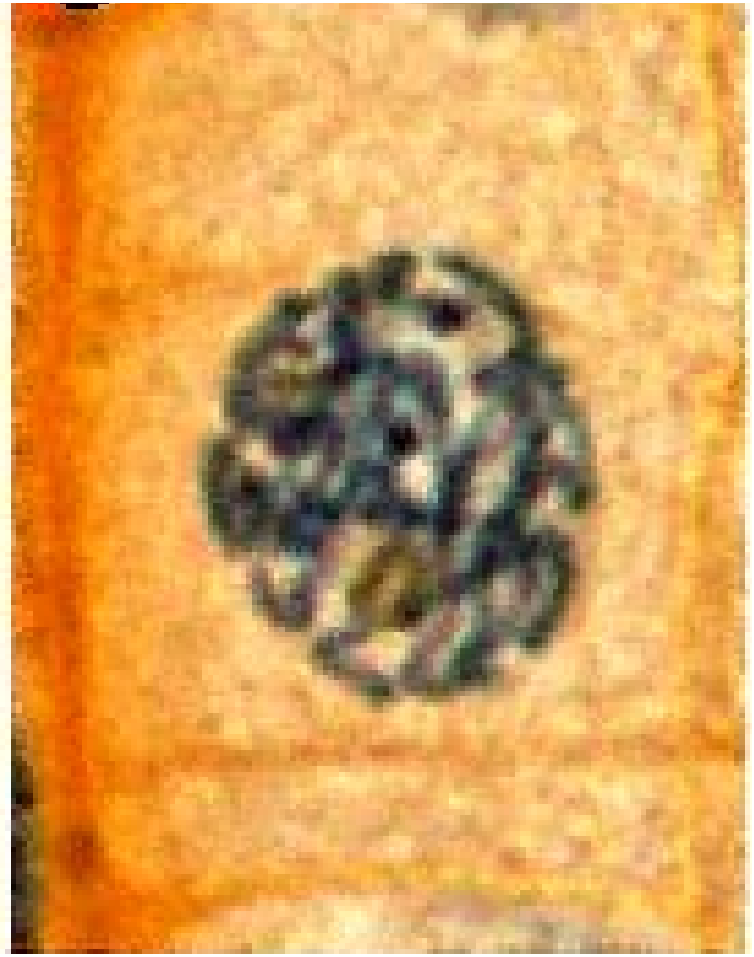




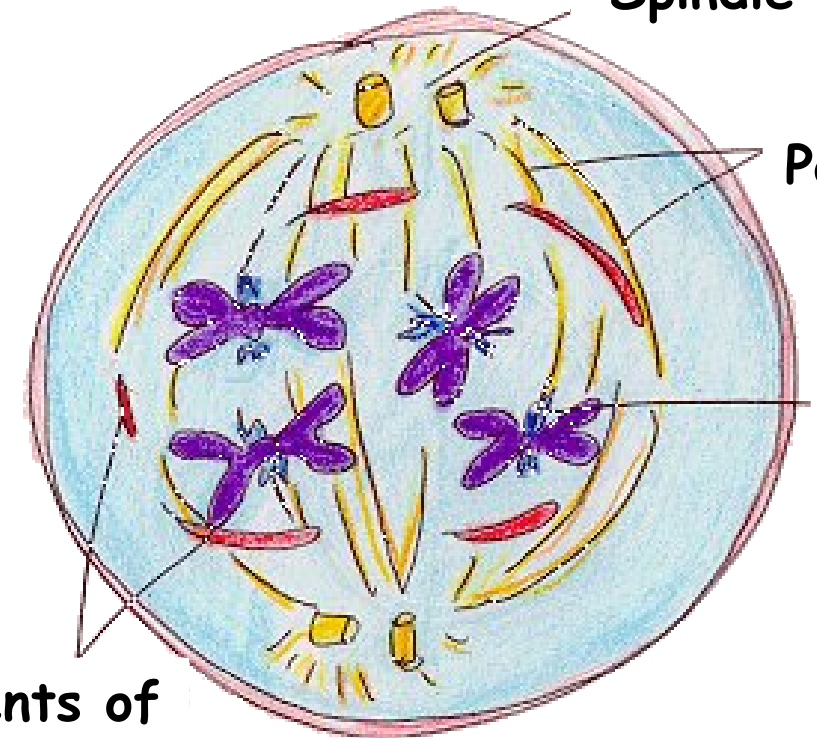
PROPHASE


Chromosome Consisting Of Two Sister Chromatides
Pair of Centrioles
Aster
Centromere

PROPHASE

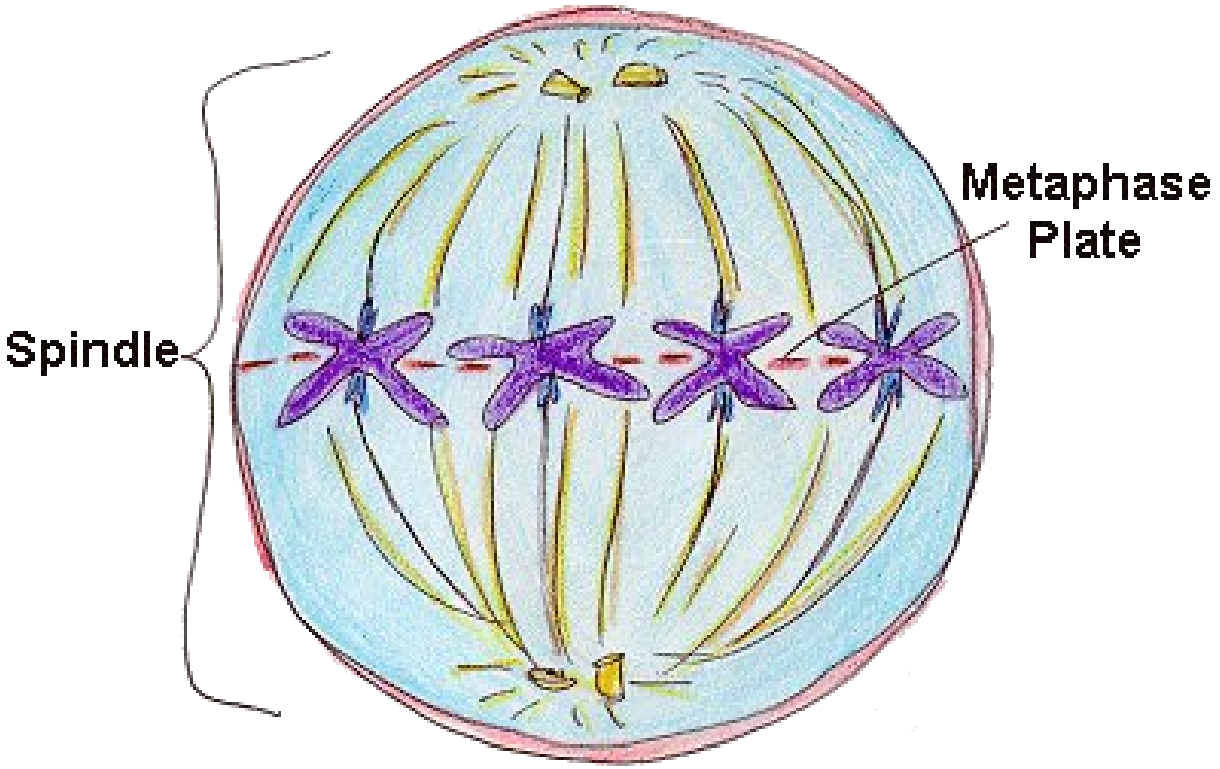


PROMETAPHASE

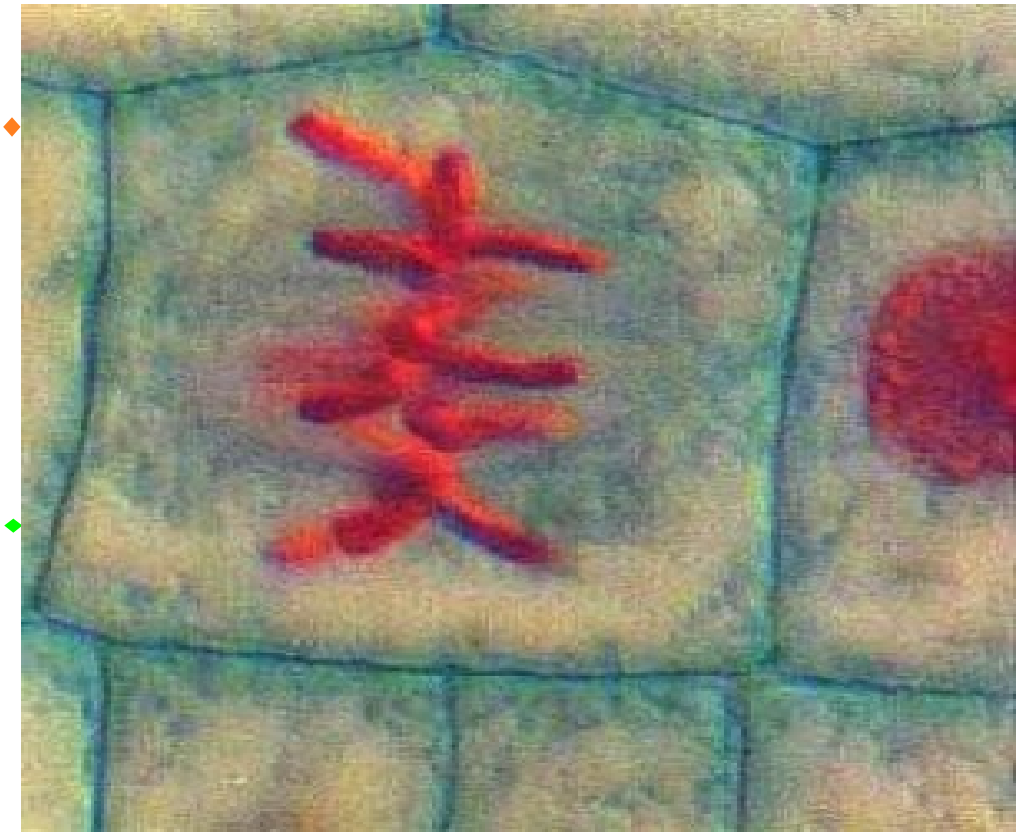


PROMETAPHASE

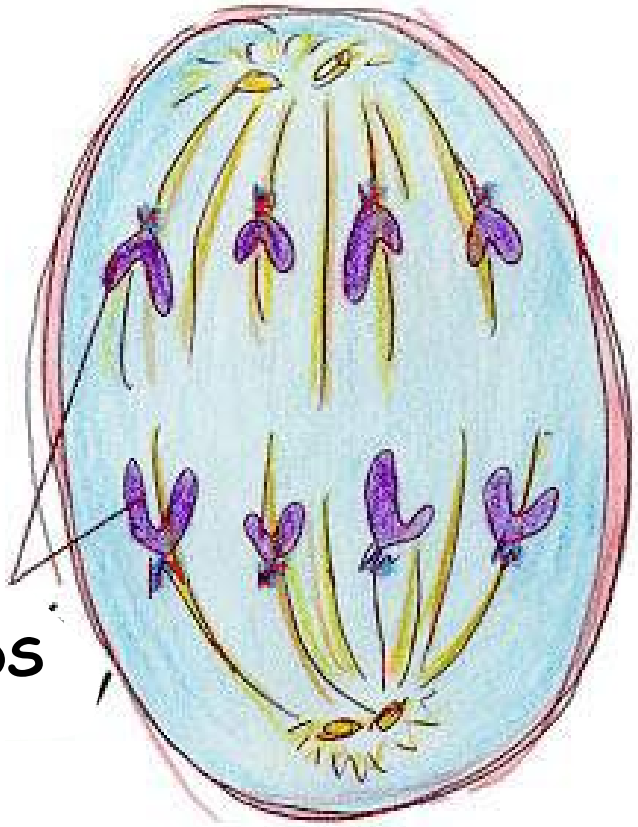
METAPHASE



METAPHASE

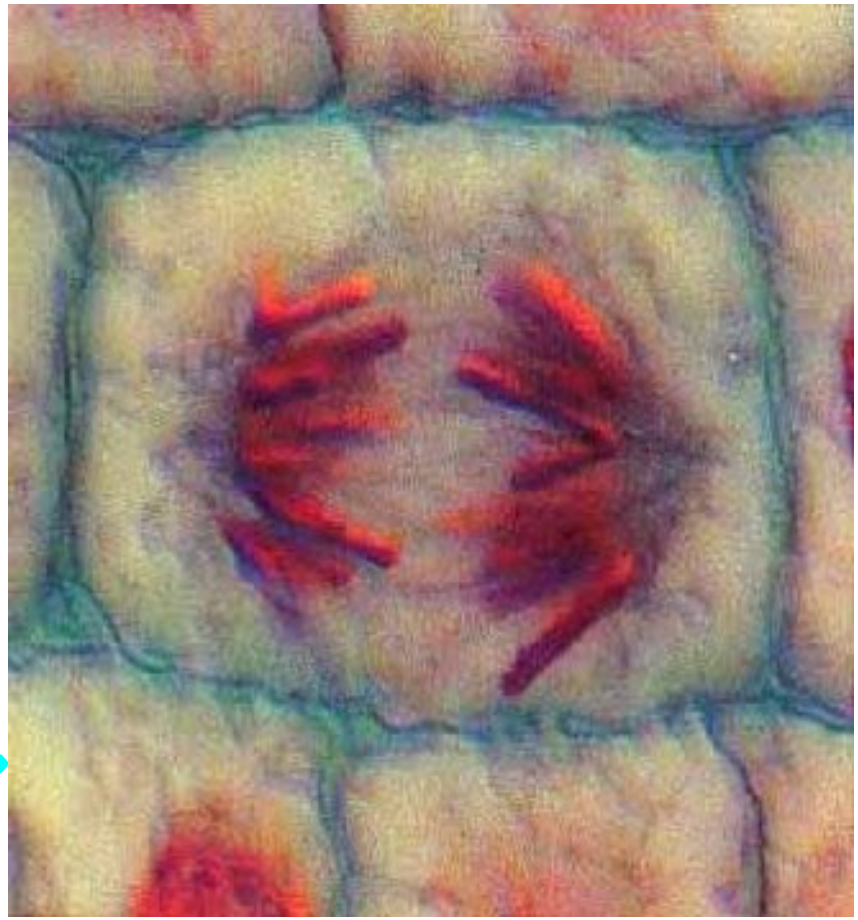


ANAPHASE

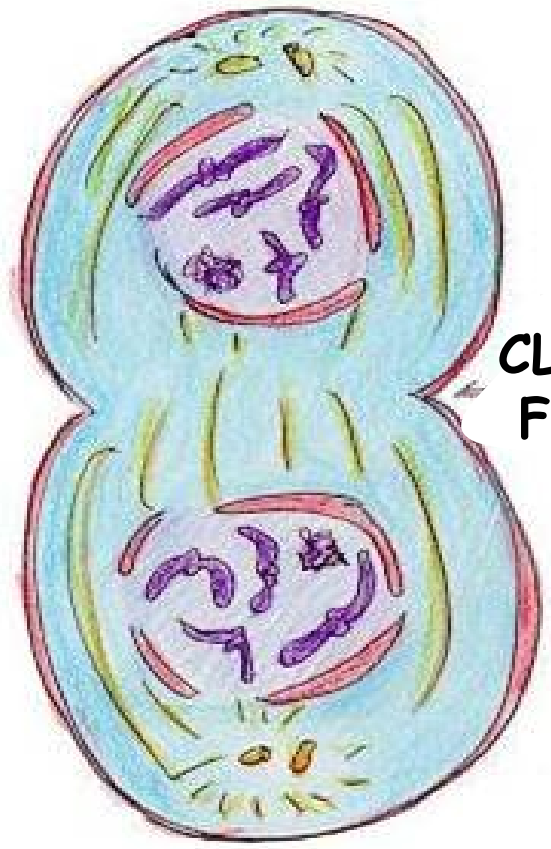


SISTER CHROMATIDS

ANAPHASE

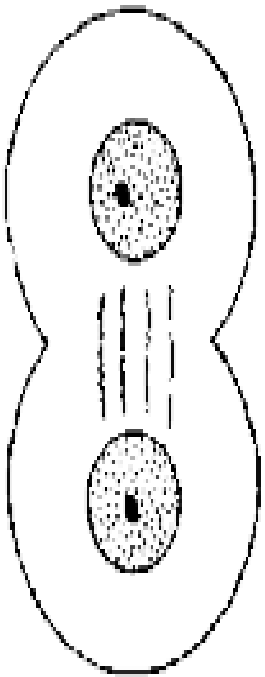


TELOPHASE

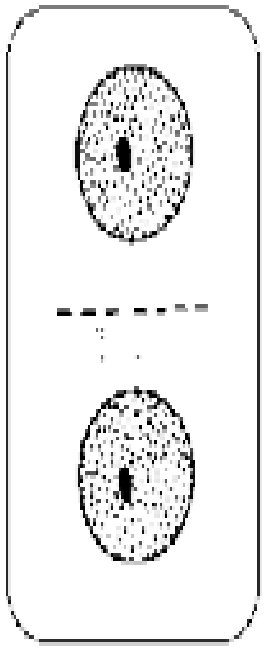


CLEAVAGE FURROW

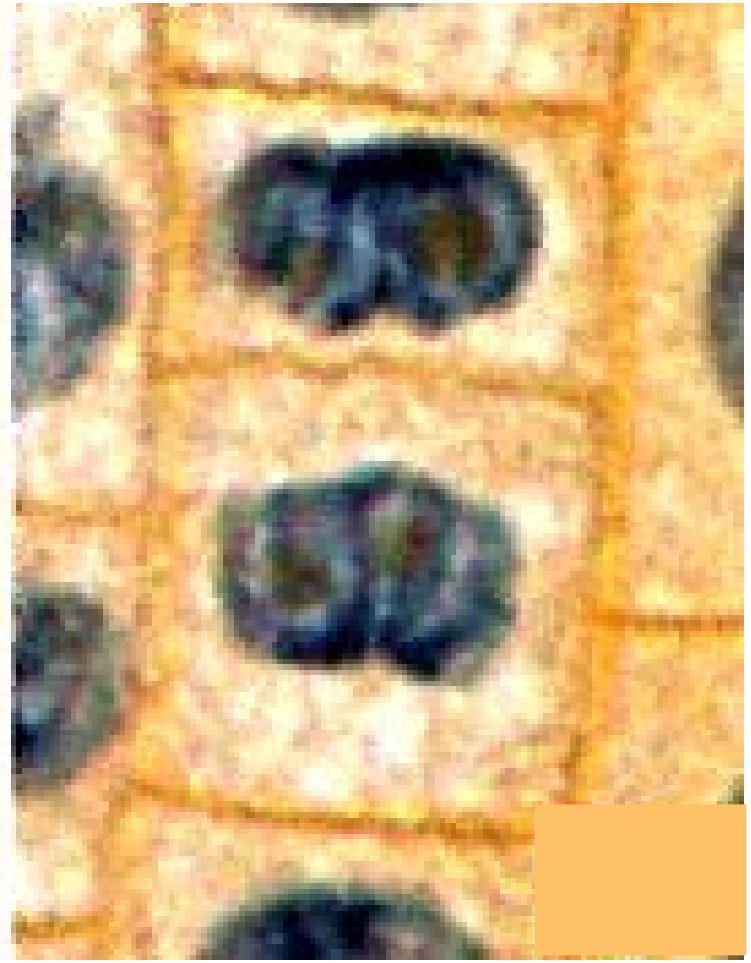
ANIMAL CELL

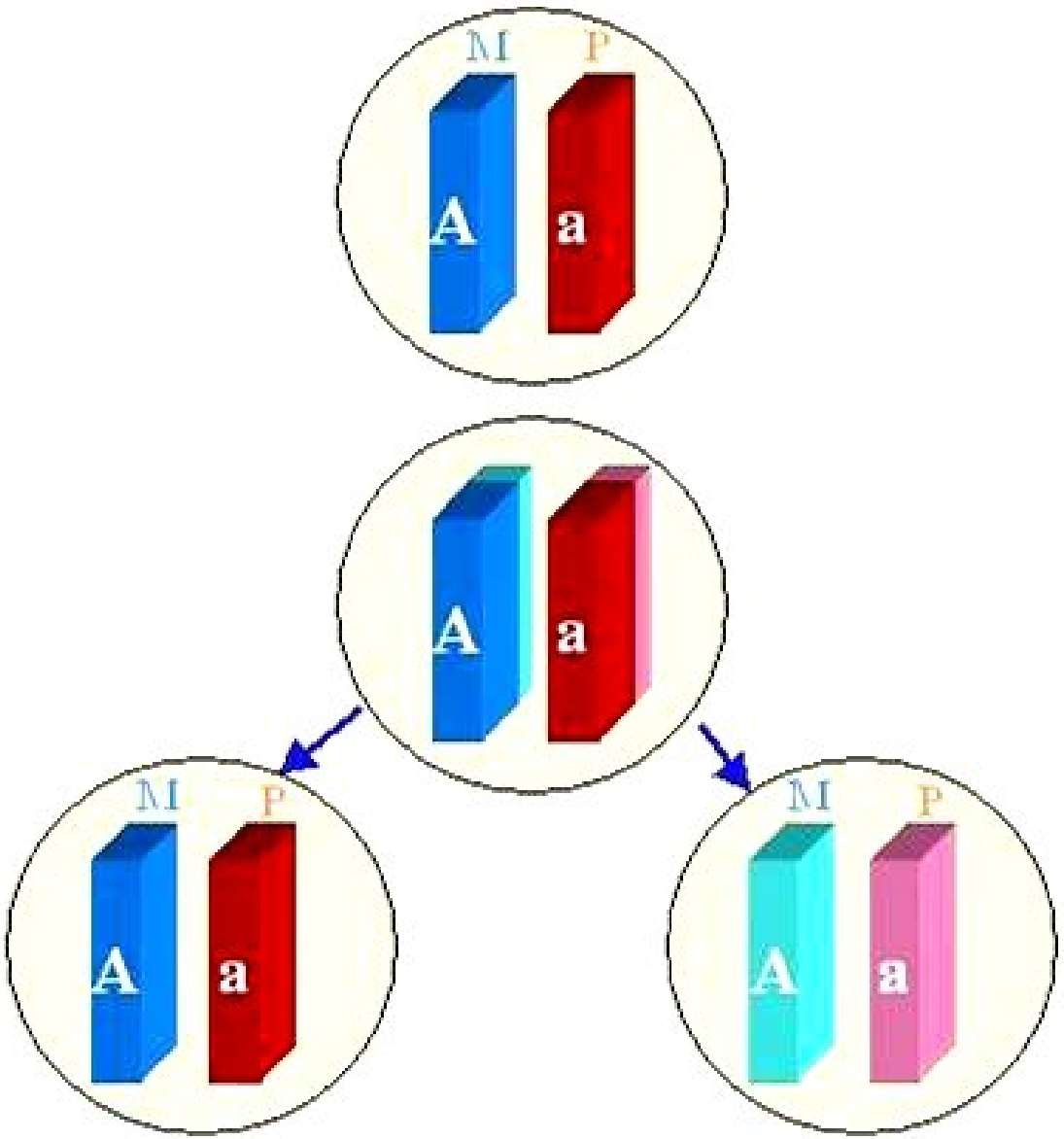


PLANT CELL



TELOPHASE




M
P
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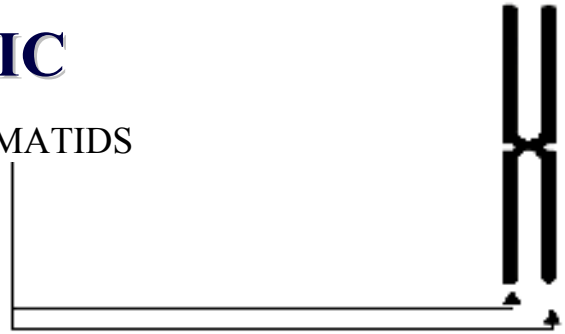
CHROMOSOME MORPHOLOGY

METACENTRIC

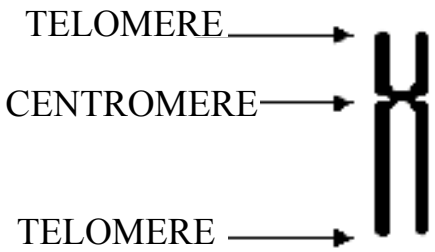
SISTER CHROMATIDS



SUBMETACENTRIC

SHORT ARMS (p)

LONG ARMS (q)



ACROCENTRIC

SAMPLES FOR CHROMOSOMAL ANALYSIS

PRENATAL DG.:

- amniotic fluid (amniocytes)
- fetal blood
- chorionic villi

~

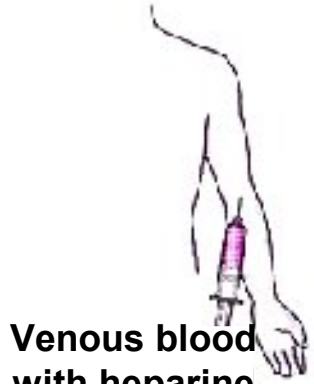
- umbilical cord and other embryonal or fetal tissues

POSTNATAL DG.:

- peripheral blood (lymphocytes)
- bone marrow
- skin (fibroblasts)
- carcinoma samples
- other tissues

CYTOGENETIC ANALYSIS

Peripheral blood



Venous blood with heparine

Add phytohaemagglutinin and culture medium

Culture at 37°C for 72 hours

Add colchicine

Hypotonic saline

Fixation

Spread cell suspension onto slide by dropping

Digest with trypsin and stain with Giemsa

Analyse metaphase

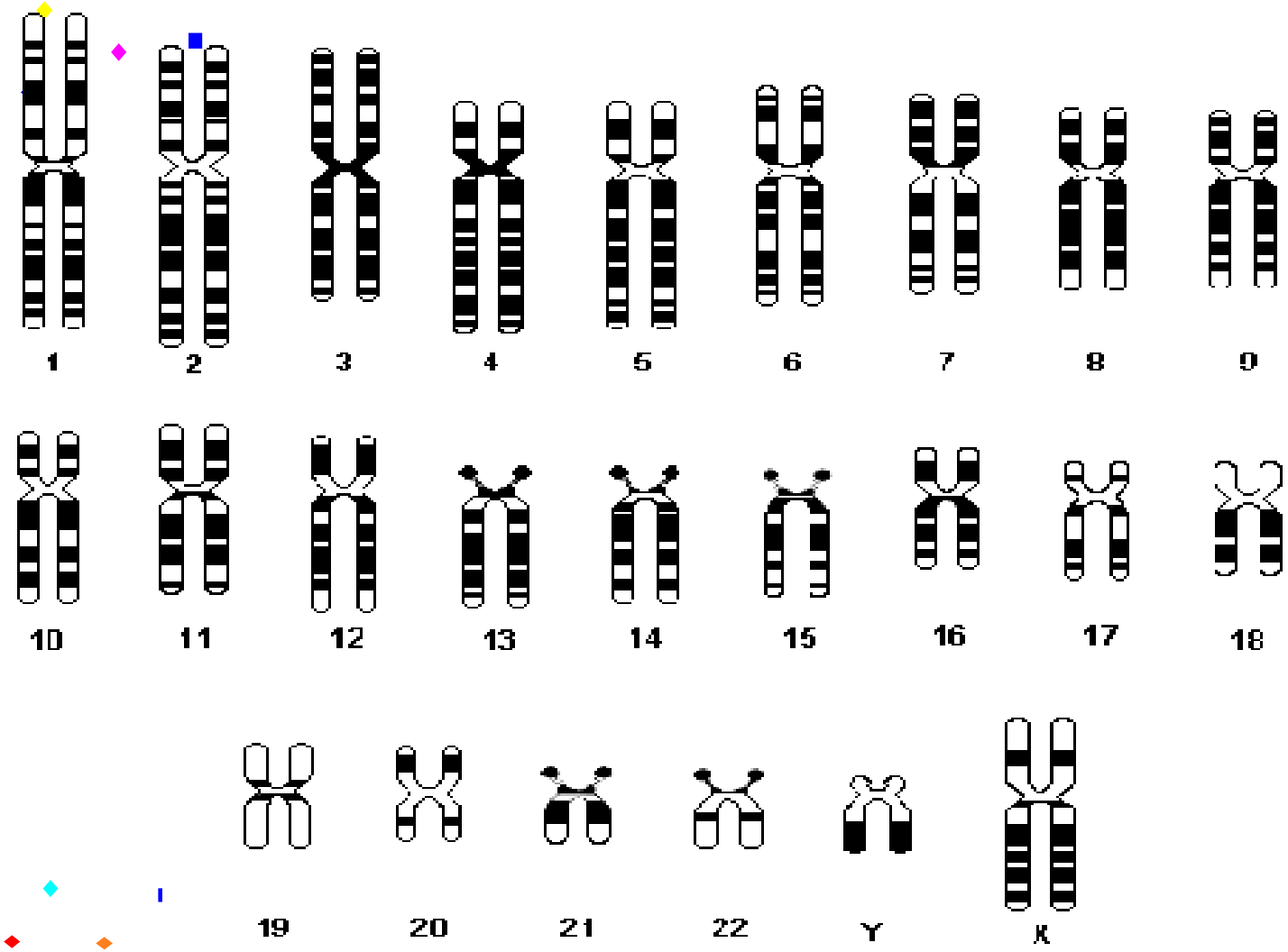
Karyotype

HUMAN KARYOTYPE

Chromosome groups characteristics

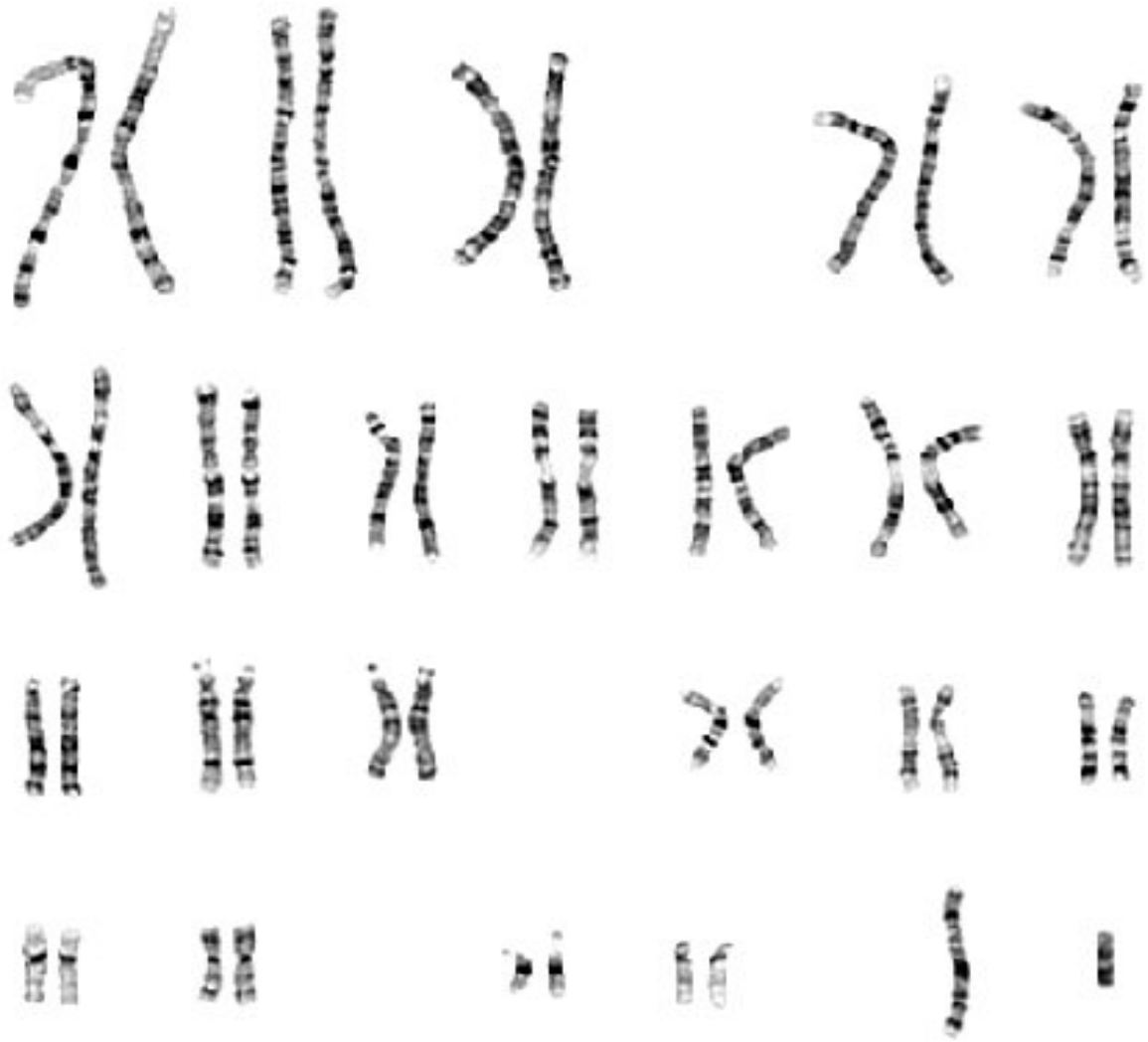
Group	Chromosomes	Size and Shape
A	1 - 3	Large metacentric
B	4 and 5	Large submetacentric
C	6 - 12 and X	Medium submetacentric
D	13 - 15	Medium acrocentric
E	16 - 18	Short submetacentric
F	19 and 20	Short metacentric
G	21 and 22 and Y	Short acrocentric

G – BANDING PATTERN

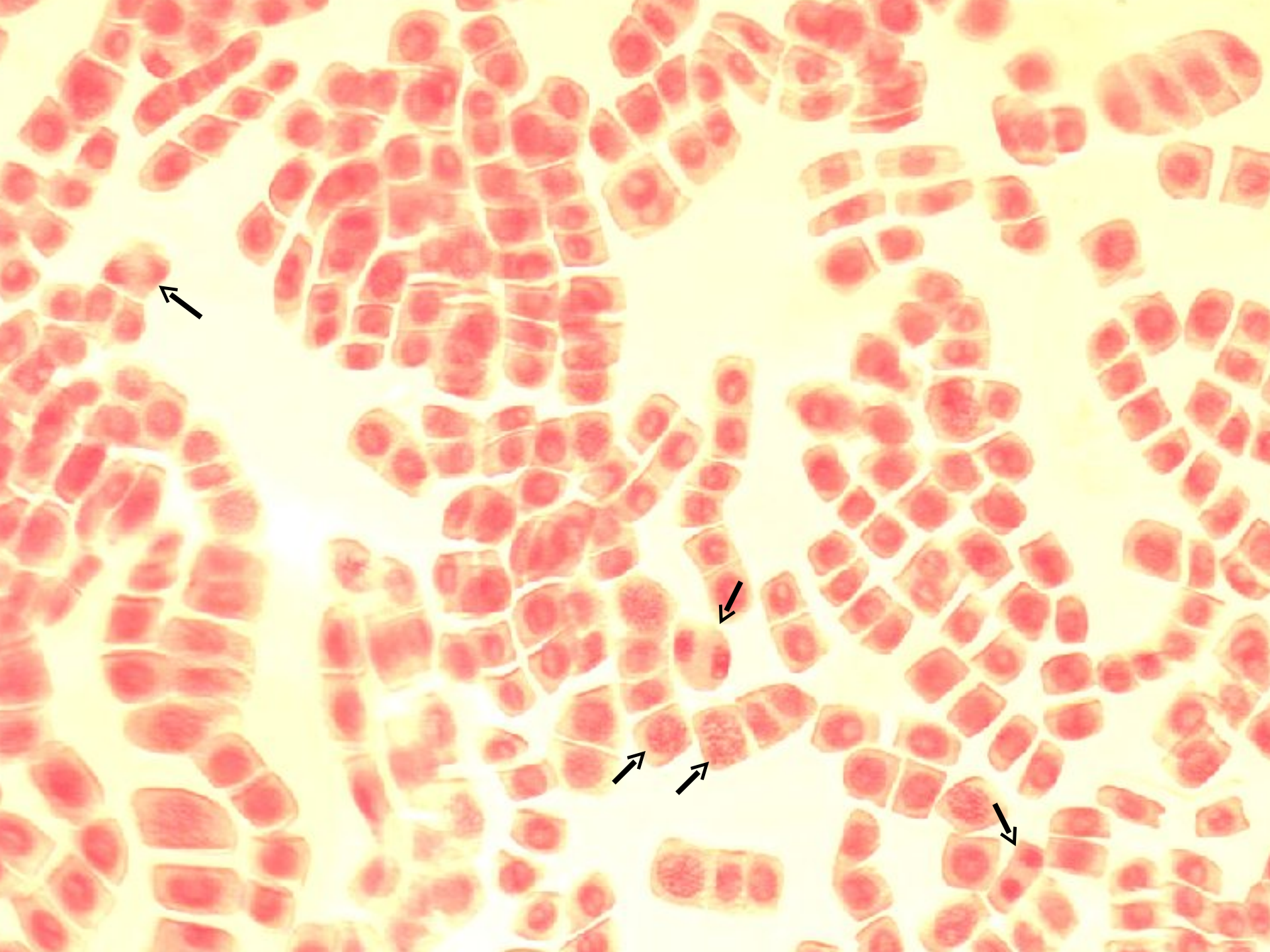


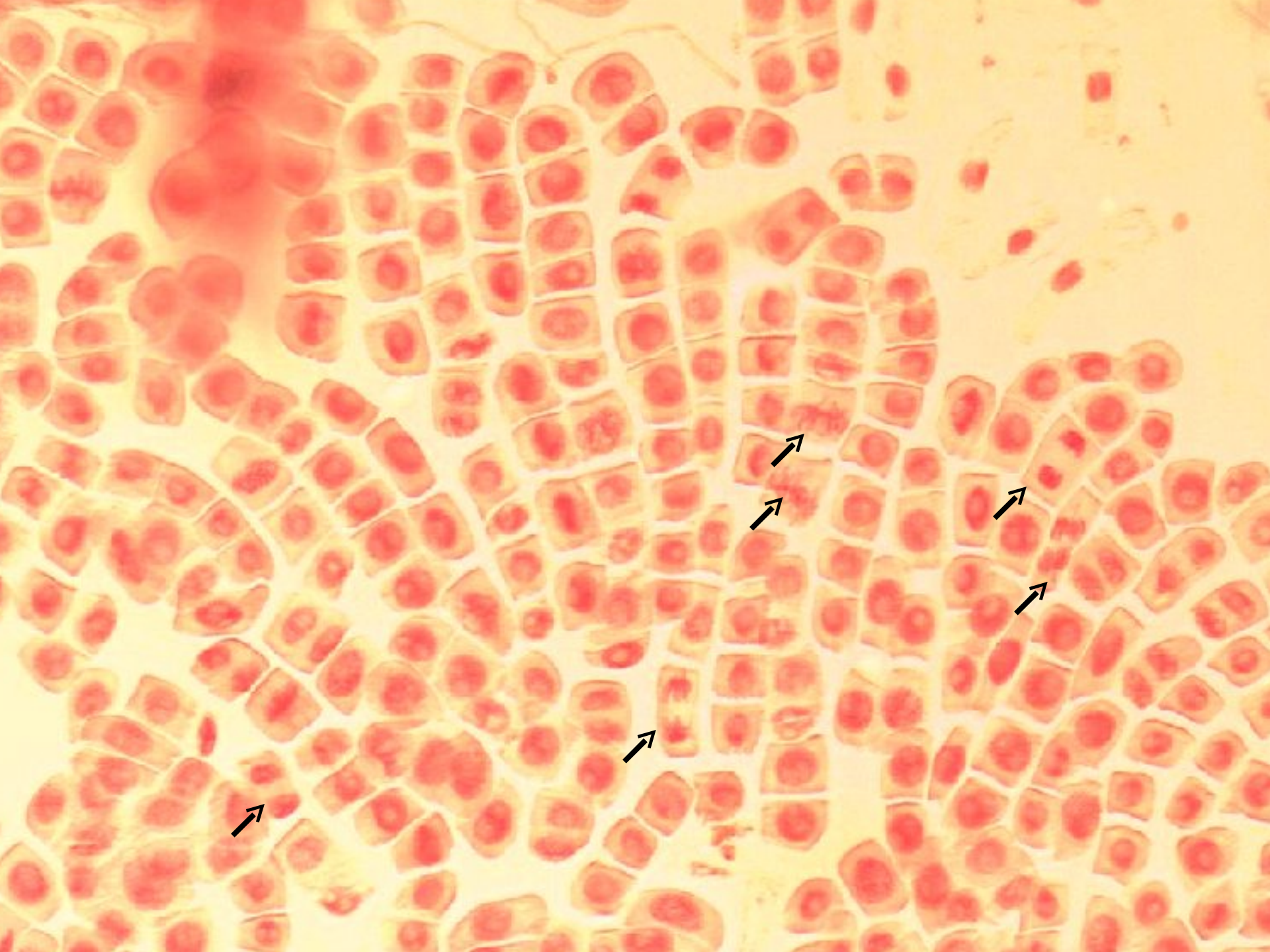
METAPHASE

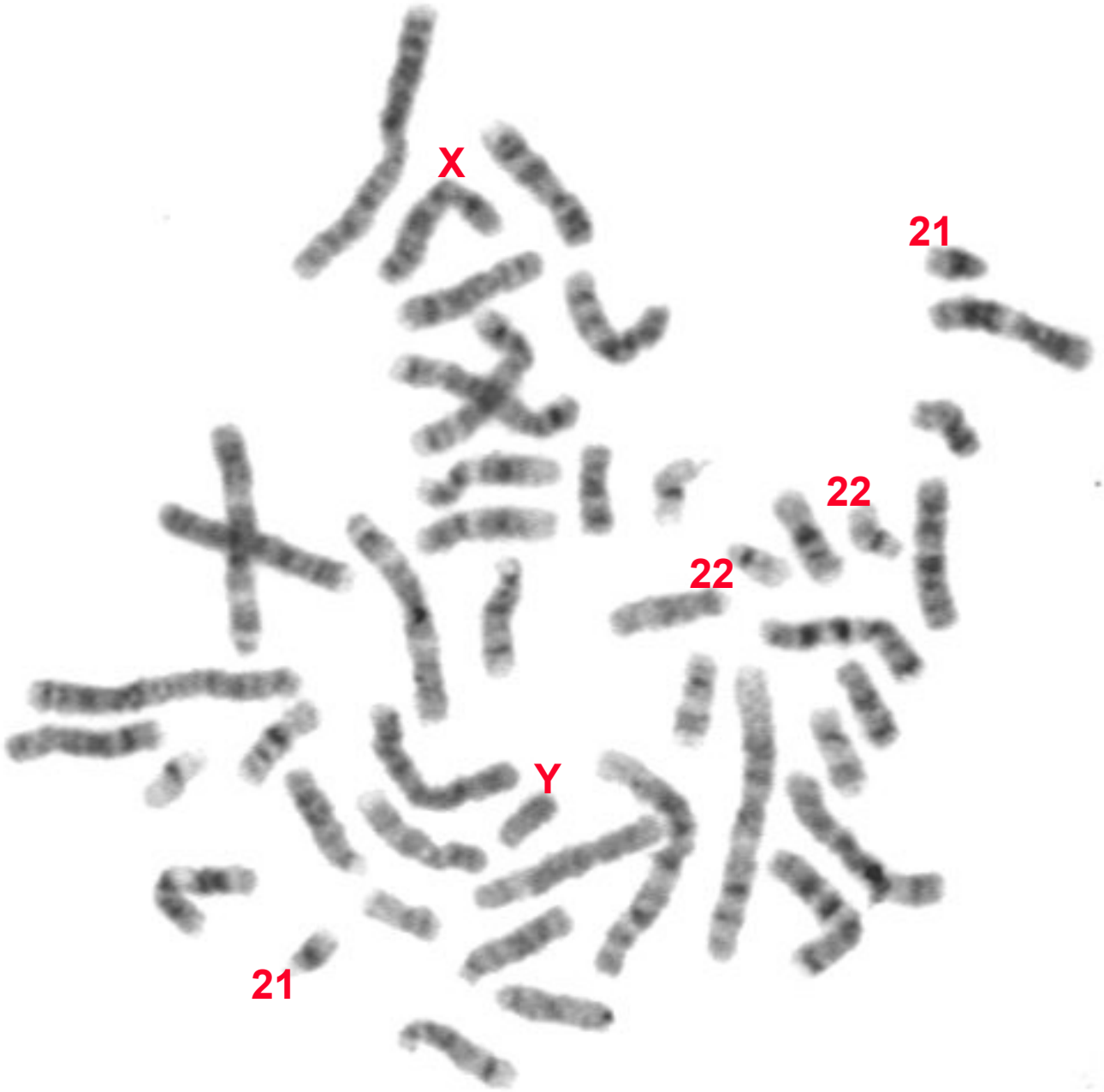
KARYOTYPE



46,XY






X
21
22
22
Y
21