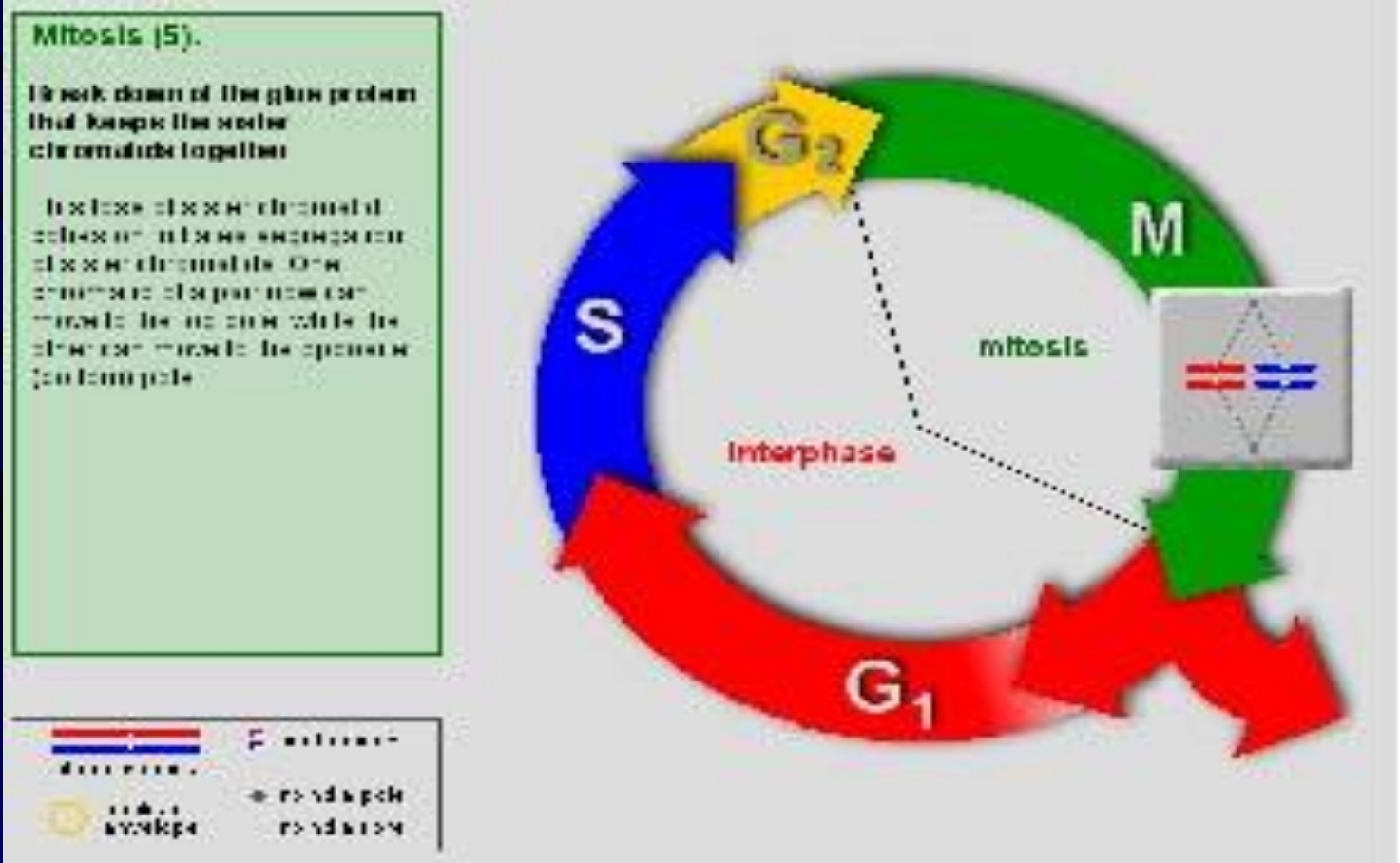
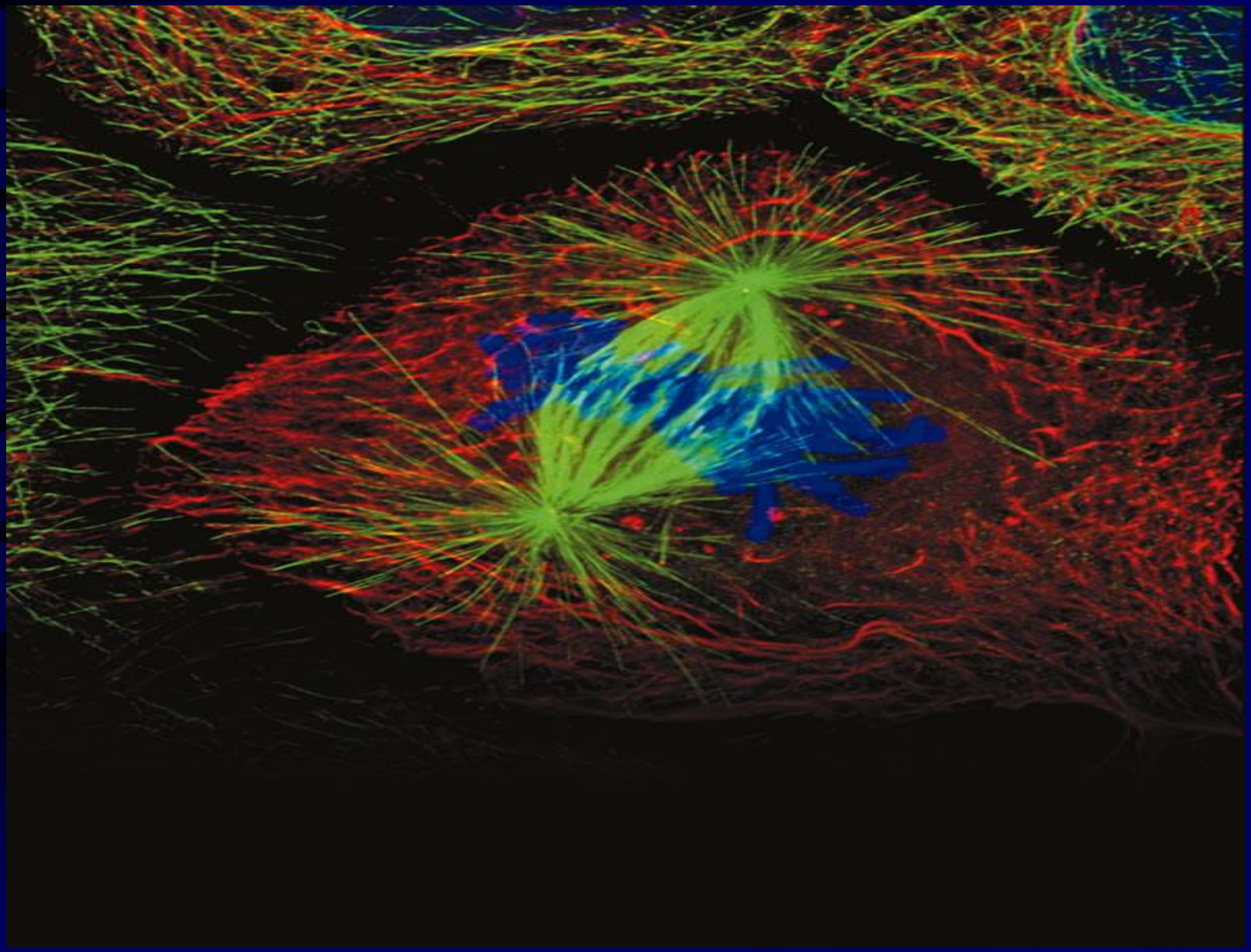
CELL REPRODUCTION CHP 6



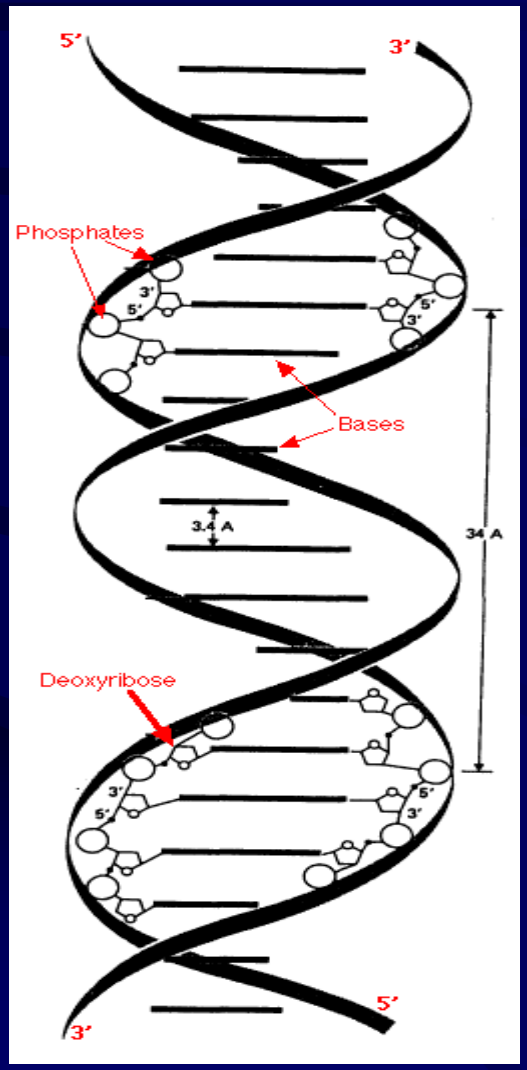
CELL REPRODUCTION IS CELL DIVISION:



NUCLEUS:

- DIRECTLY INVOLVED IN CELL REPRODUCTION

DNA-DOUBLE HELIX

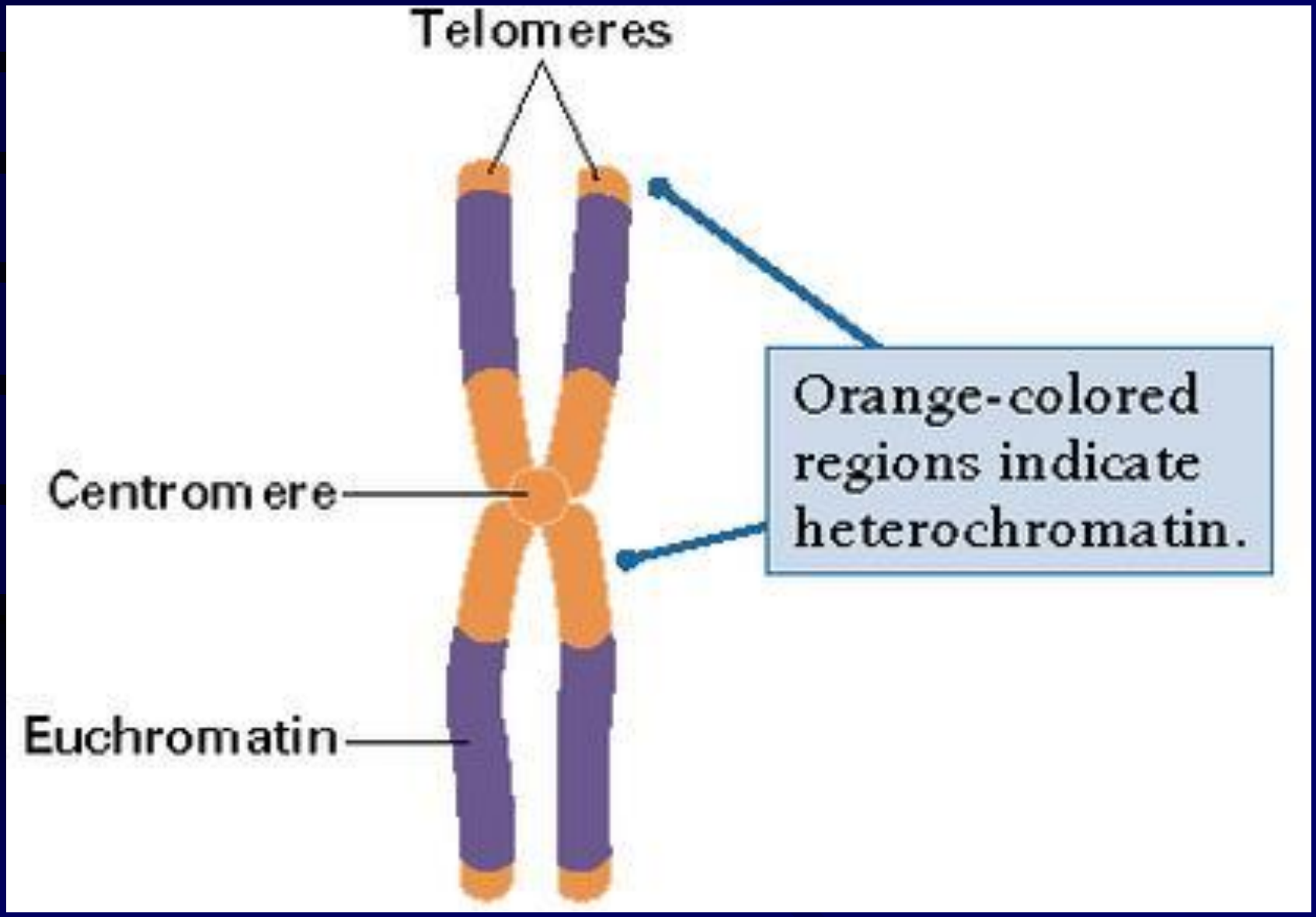


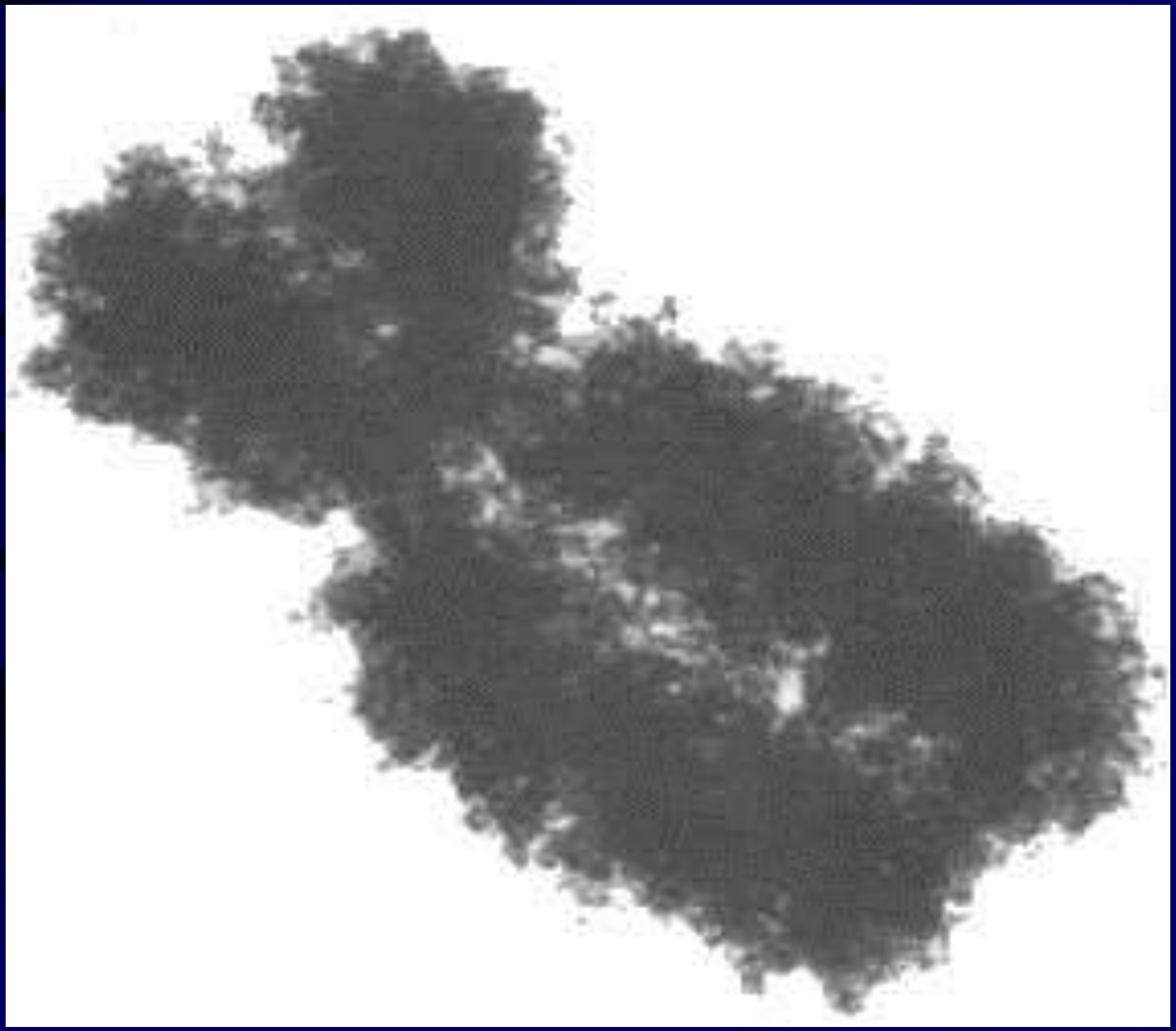
DNA-DEOXYRIBONUCLEIC ACID:

- LONG, THIN MOLECULE THAT STORES GENETIC INFORMATION
- CONSISTS OF SIX BILLION PAIRS OF NUCLEOTIDES(PROTEINS)
- COILED UP INTO VERY COMPACT STRUCTRES CALLED CHROMOSOMES
- UNTIED CHROMOSOMES~40 MILES

CHROMOSOMES:

- COILED UP DNA
- ROD-SHAPED STRUTURES MADE OF DNA AND PROTEINS
- CONTAINED WITHIN THE NUCLEAR MEMBRANE
- PROTEIN HISTONE WHICH DNA TIGHTLY WRAPS AROUND TO MAINTAIN THE CHROMOSOMES SHAPE


Telomeres
Centromere
Euchromatin
Orange-colored regions indicate heterochromatin.



CHROMATIN:

- FINE STRANDS OF DNA AND PROTEIN
- IS LESS TIGHTLY COILED DNA DURING CELL DIVISION SO THAT IT CAN BE READ TO DIRECT THE CELLS ACITVITIES

CHROMOSOME NUMBER:

- EACH SPECIES HAS A CERTAIN CHARACTERISTIC NUMBER OF CHROMOSOMES IN EACH CELL
- THIS GIVES THE ORGANISMS IDENTITY
- HUMANS-46 CHROMOSOMES OR 23 PAIRS

CHROMOSOME COUNT:

- DIPLOID-CELLS HAVING **TWO** SETS OF CHROMOSOMES (2N)
- HAPLOID-CELLS CONTAIN ONLY **ONE** SET OF CHROMOSOMES (1N)

CHROMOSOMES:

- ARE EITHER SEX CHROMOSOMES OR AUTOSOMES
- SEX CHROMOSOMES-DETERMINE ORGAMISMS SEX

  HUMANS-X OR Y

  FEMALES-XX

  MALES-XY

* AUTOSOMES-ALL OTHER CHROMOSOMES

HOMOLOGOUS CHROMOSOMES:

- TWO COPIES OF EACH CHROMOSOME

CELL DIVISION IN PROKARYOTES:

- BINARY FISSION
- TWO IDENTICAL CELLS ARE PRODUCED

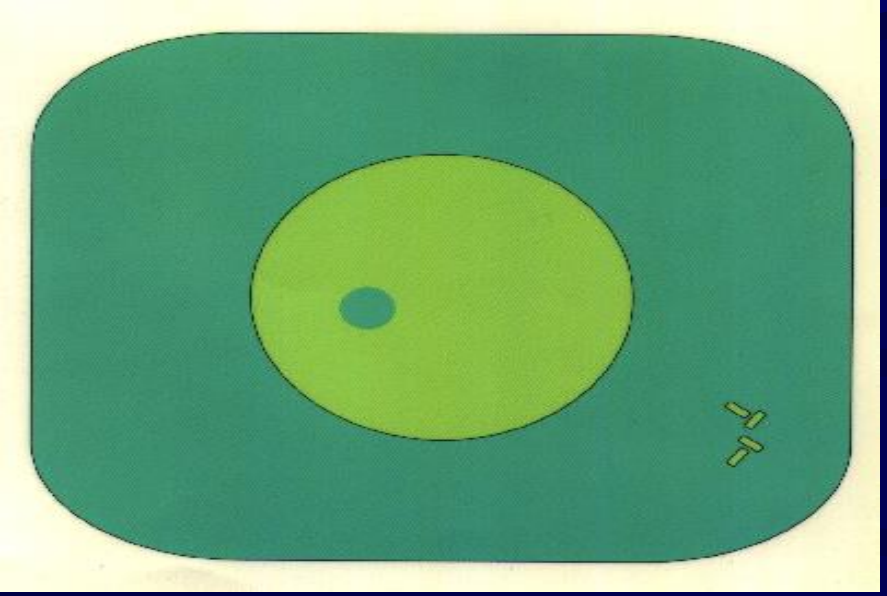
CELL DIVISION IN EUKARYOTES:

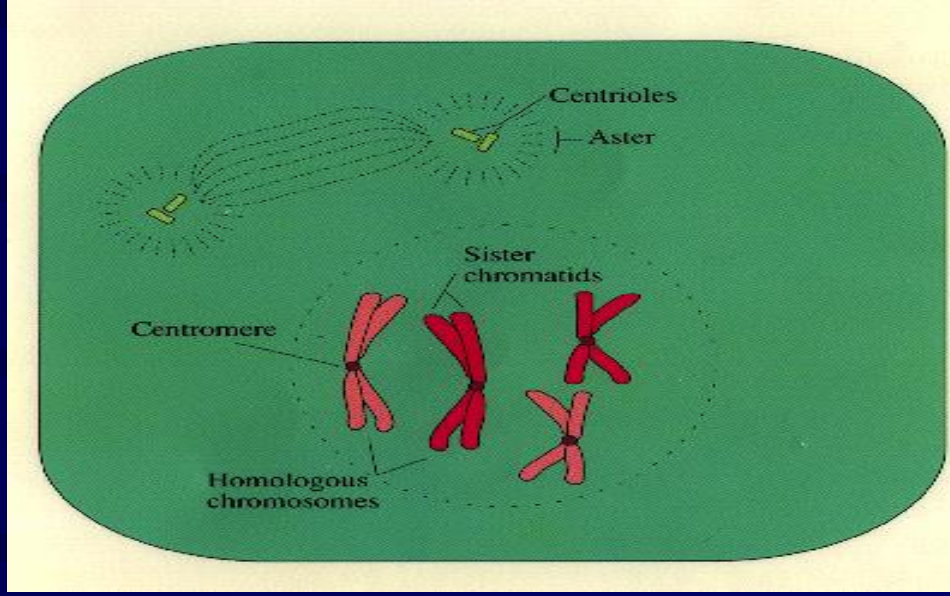
- BOTH THE CYTOPLASM AND NUCLEUS DIVIDE
- TWO TYPES OF DIVISION

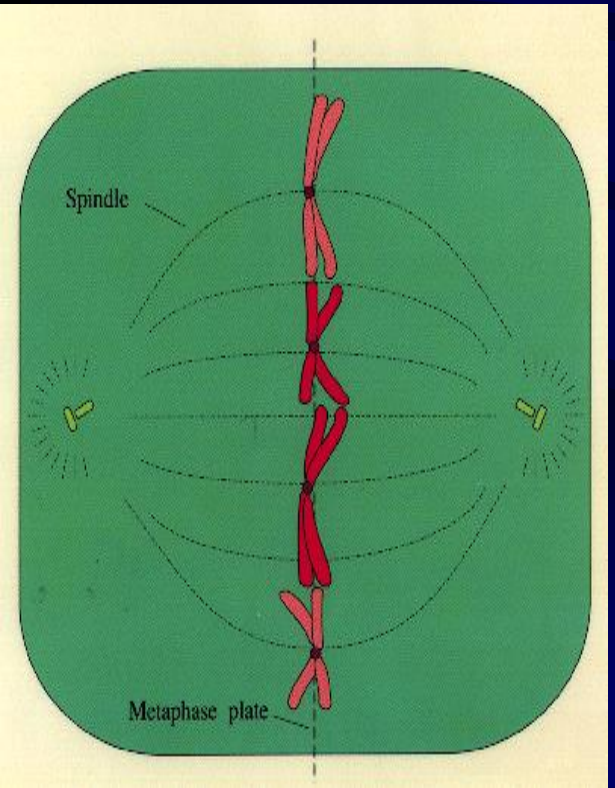
1. MITOSIS
2. MEIOSIS

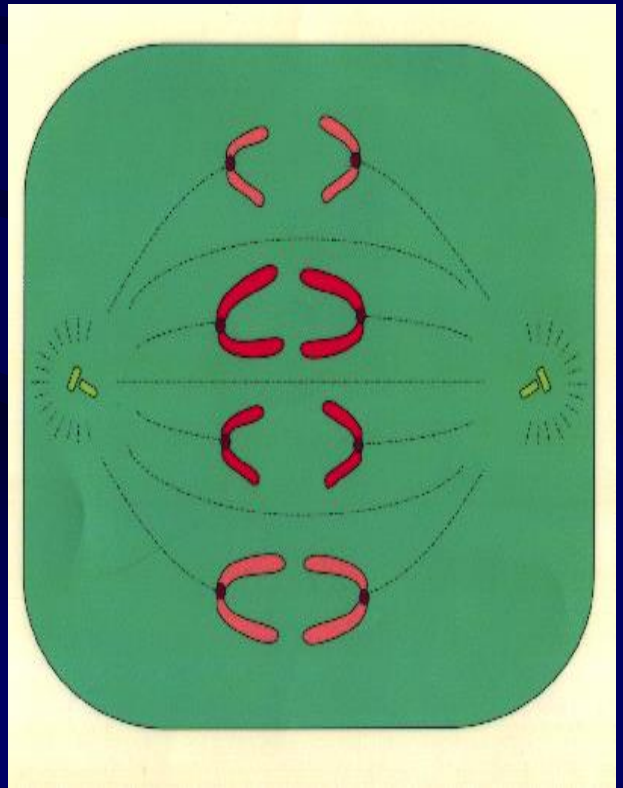
MITOSIS:

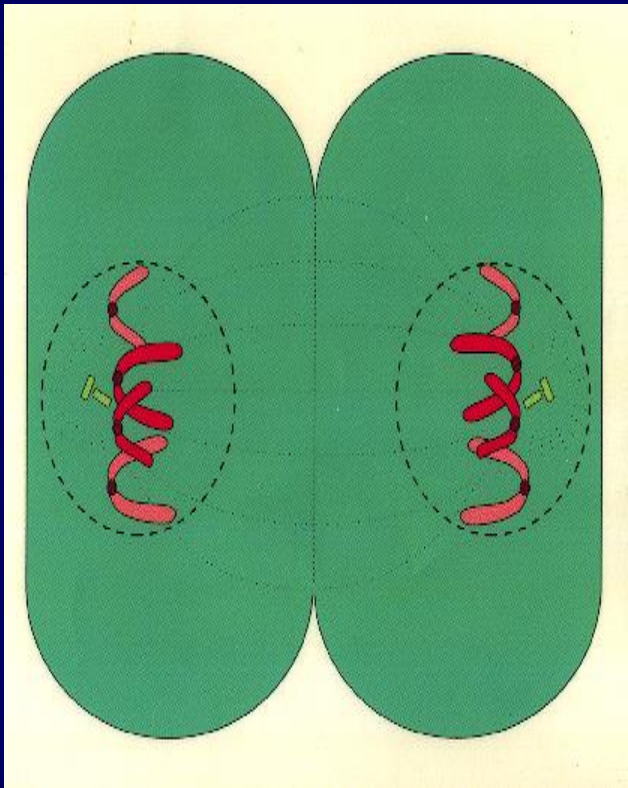
- NEW CELLS AND GENETIC MATERIAL ARE IDENTICAL TO THE ORIGINAL CELL
- PROCESS OF **COPYING** MATERIAL
- GENETIC MATERIAL IS DIPLOID (2N)
- PROCESS REPRODUCES NEW CELLS TO REPLACE OR ADD TO EXISTING TISSUE OR ORGAN SYSTEMS

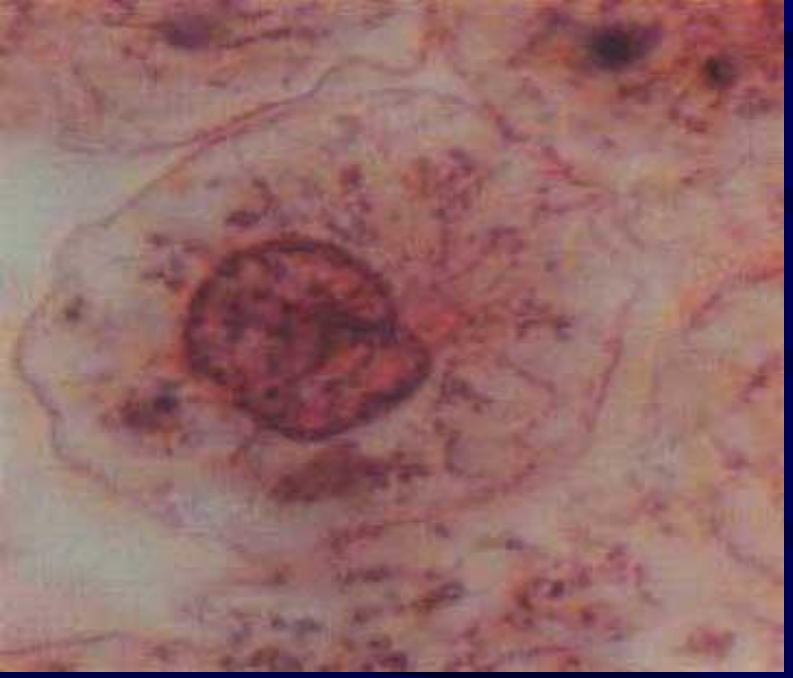


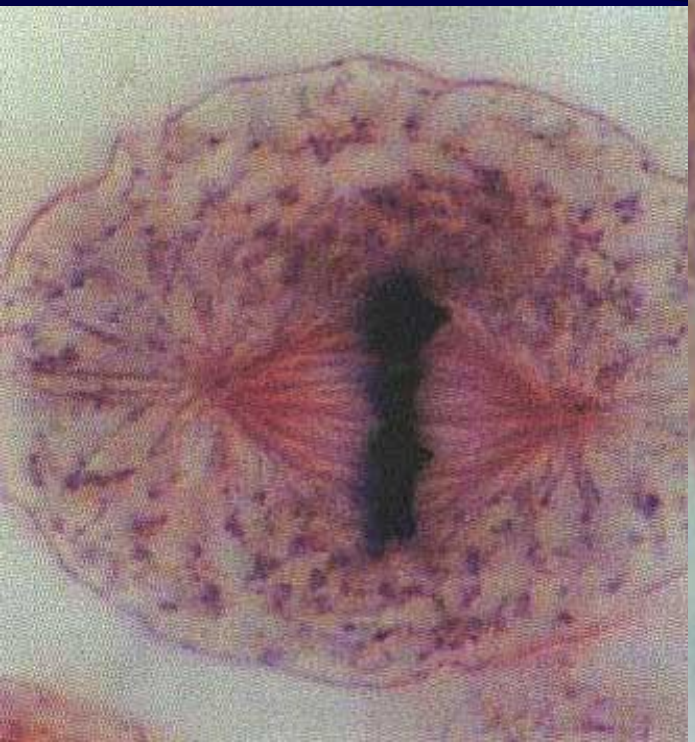
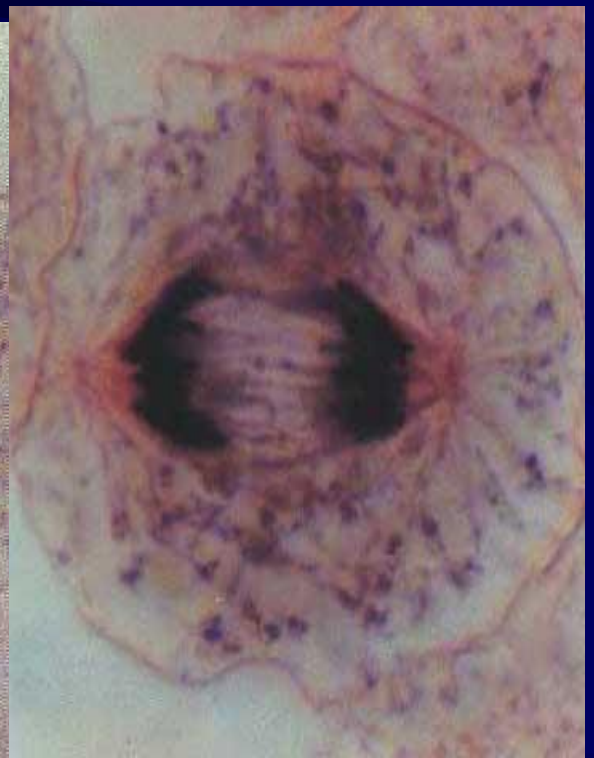

Centrioles
Aster
Sister chromatids
Centromere
Homologous chromosomes


Spindle
Metaphase plate



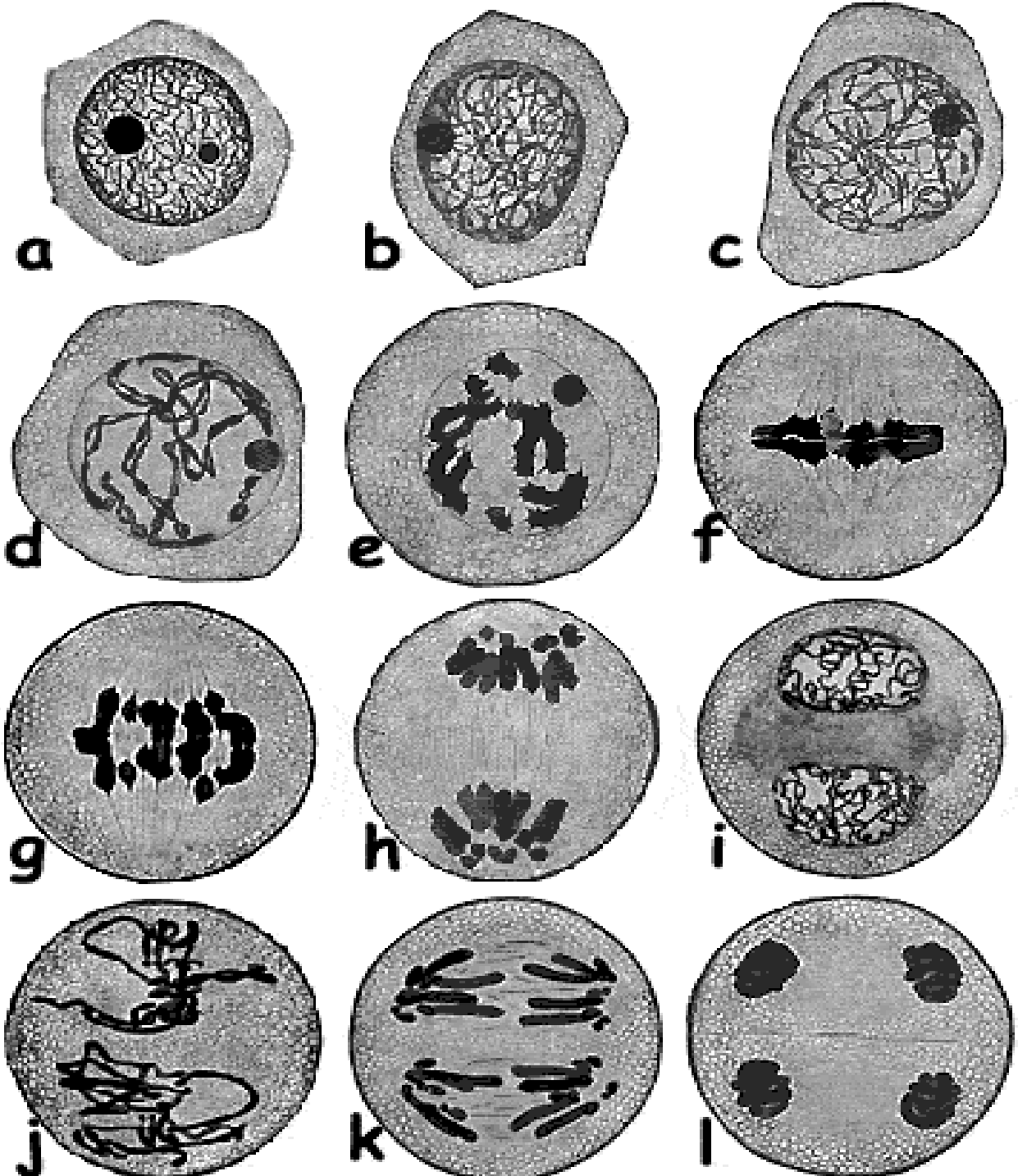





MEIOSIS:

- REDUCES CHROMOSOME COUNT BY HALF IN THE NEW CELLS
- PROCESS OF **SPLITTING** INFORMATION
- GENETIC MATERIAL IS REDUCED BY HALF IN THE NEW CELLS AND PRODUCES GAMETES (SEX CELLS 1N)



MEIOSIS I

Prophase I:

- a Leptotene
- b Zygotene
- c Pachytene
- d Diplotene
- e Diakinese

f Metaphase I

g Anaphase I

h Telophase I

i INTERKINESIS

MEIOSIS II

j Metaphase II

k Anaphase II

l Meiocytes (4)

Source: Schaffstein in Strasburg
www-vcbio.sci.kun.nl