

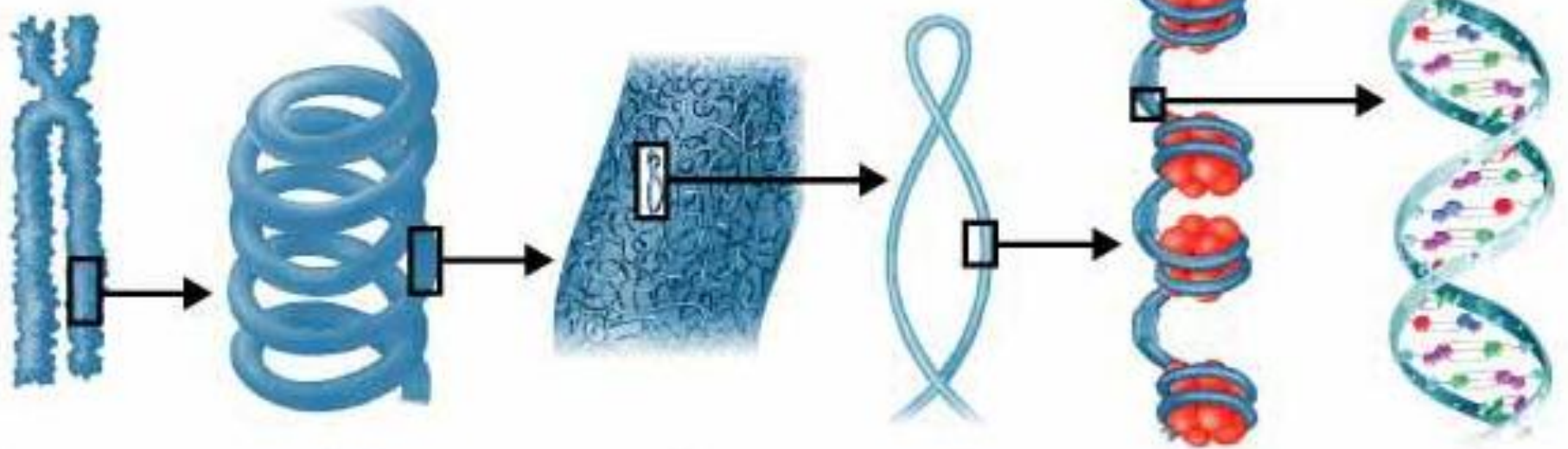
Chromosomes and Cell Division

Ch10

- Where is DNA found in the cell?
 - Nucleus
- Why do cells divide?
 - Need to grow, reproduce, repair / replace, and to go from unicellular to multicellular

Vocabulary

- DNA – Deoxyribonucleic acid
- Histone – protein that holds coils of DNA together
- Chromatin – loose form of DNA in a non-dividing cell
- Chromosome – condensed form of DNA in a dividing cell
- Chromatid – each half of the chromosome
- Centromere – constricted area that holds chromatids together



Chromosome

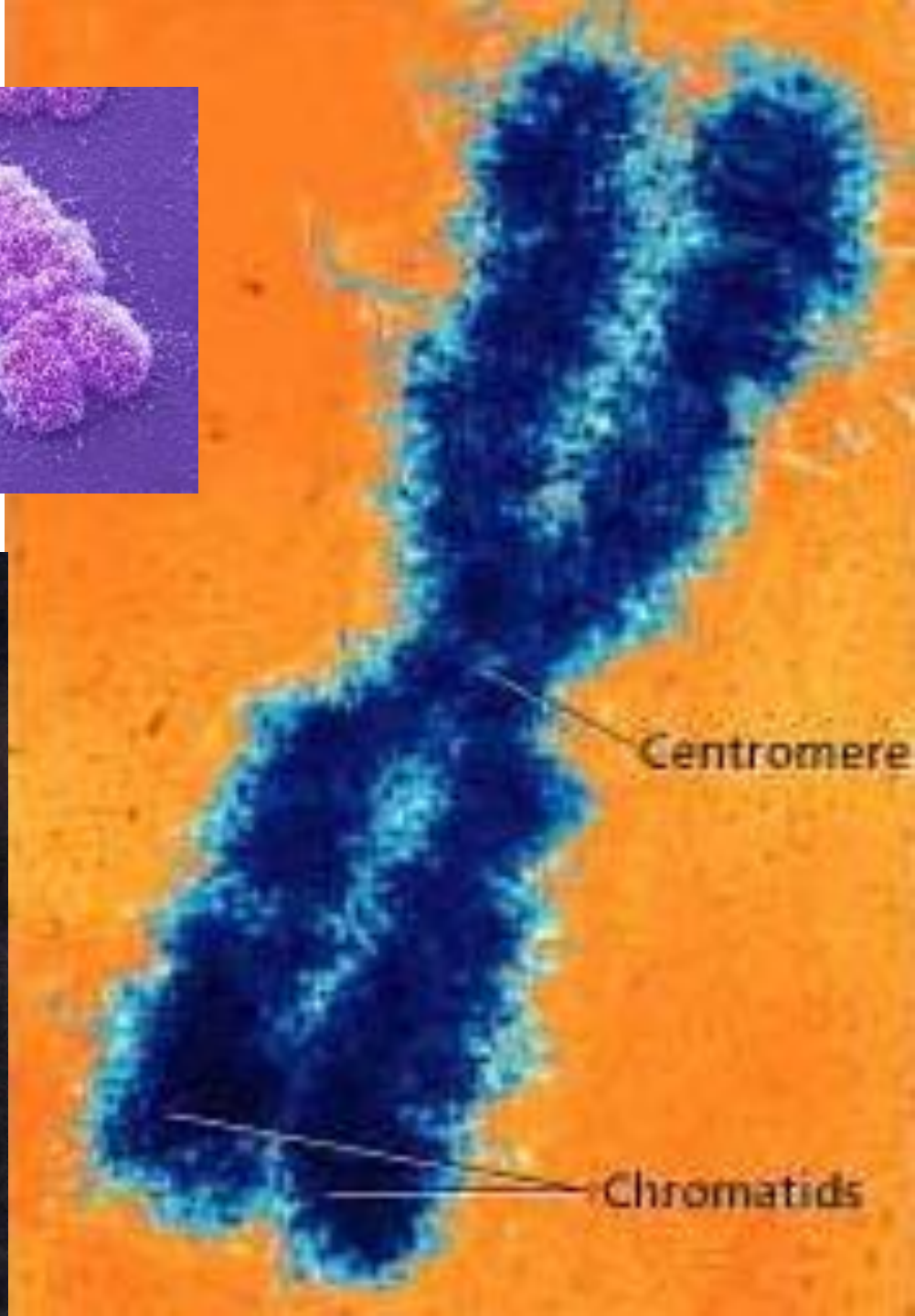
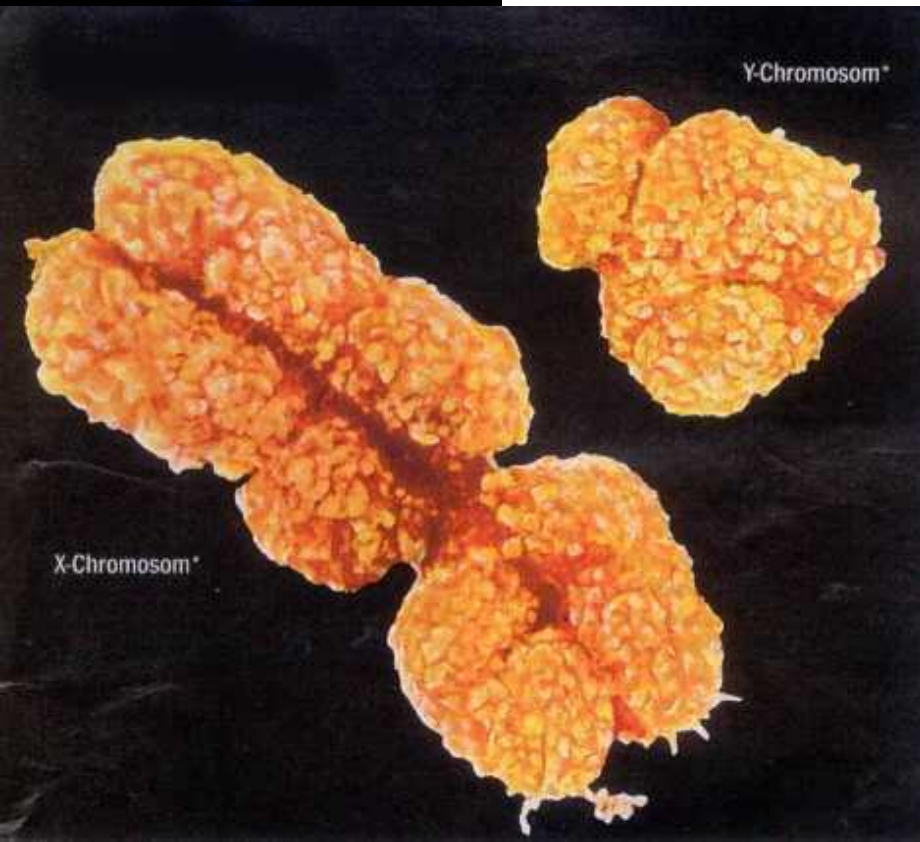
Supercoil within chromosome

Further coiling within supercoil

One coil within supercoil

DNA and proteins

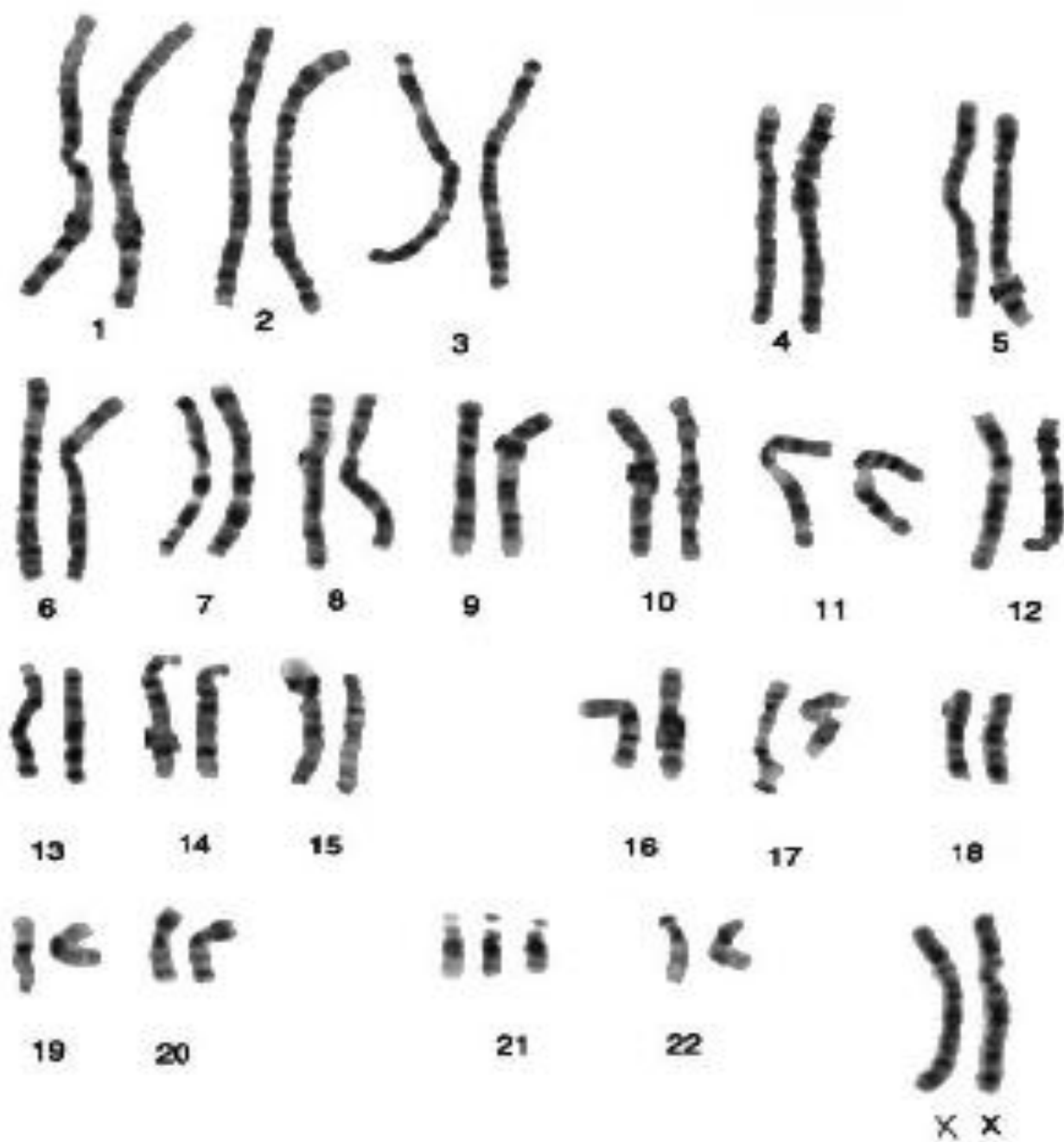
DNA double helix



Chromosomes in a Cell

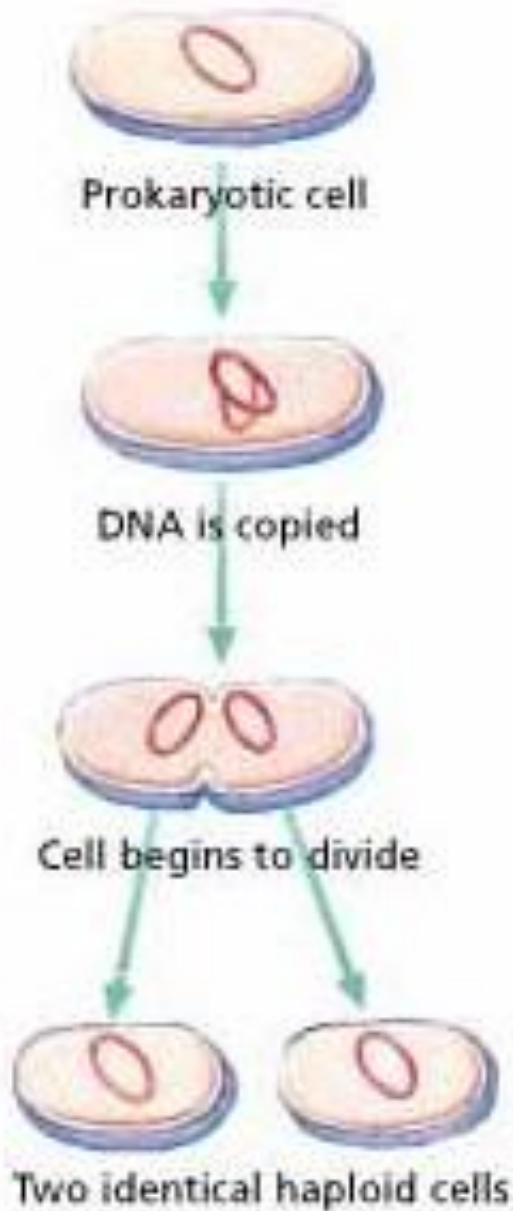
- Karyotype – picture of chromosomes in a dividing cell and arrange by pairs
- Sex chromosome – determines sex of individual
 - XX = female
 - XY = male
- Autosomes – all other chromosomes (1-22)
- Homologous chromosomes – 2 copies of each chromosome that are the same size and shape

Trisomy 21
47,XX,+21



Number of Chromosomes

- Diploid ($2n$) – 2 sets of chromosomes
 - One set from Mom and one set from Dad
- Haploid ($1n$) – 1 set of chromosomes
 - Sex cells – sperm and egg
 - $1n + 1n = 2n$
- Some plants cells have $8n$

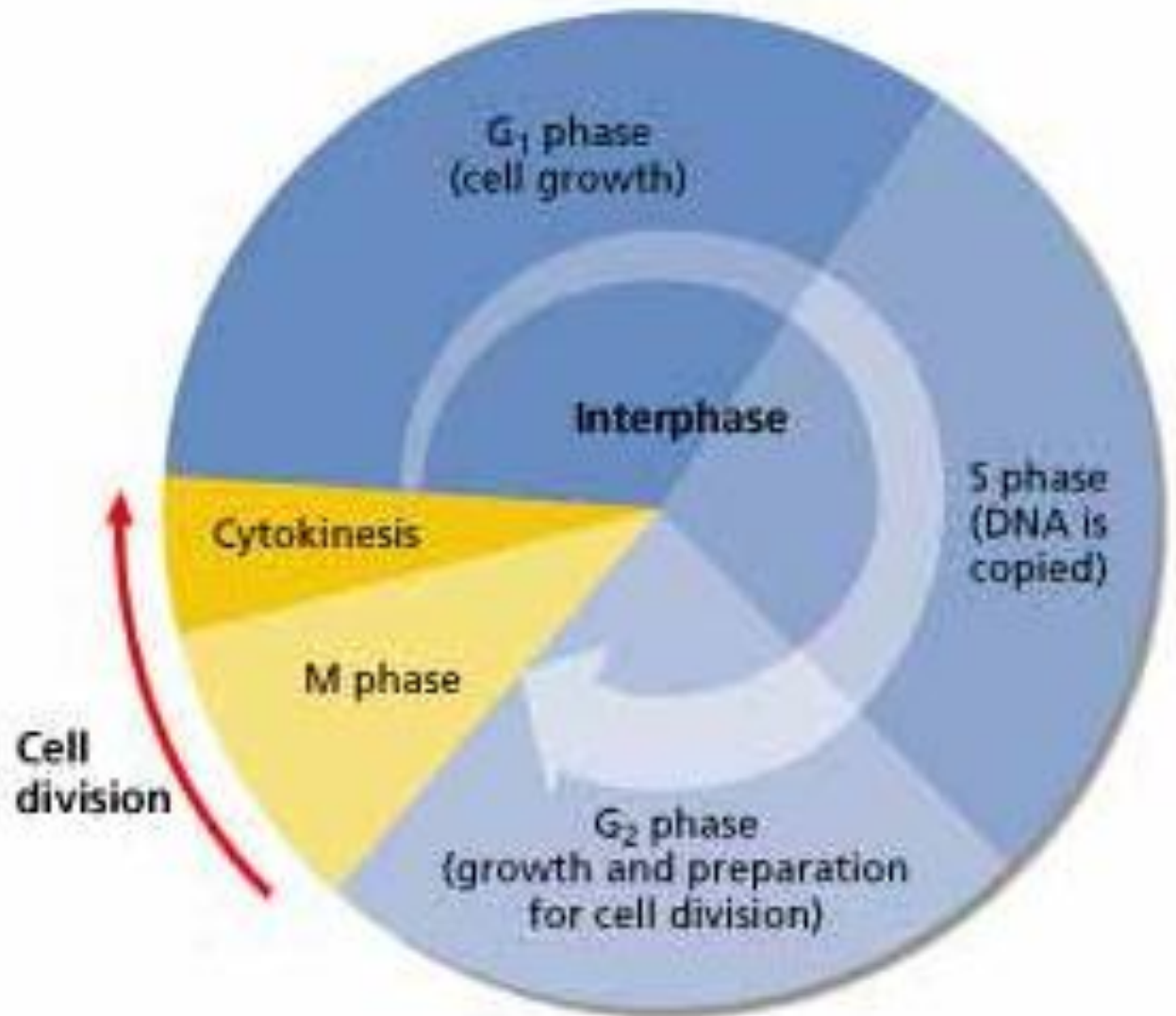


Prokaryotic Cell Division

- Binary fission – cell division of a bacteria cell

Cell Cycle

- Eukaryotic Cell Division



Mitosis

- Mitosis = Division of the nucleus
- Cytokinesis = Division of the cytoplasm
- In mitosis, DNA gets copied and then divided with the cell