Chromosome Biology Lab, IISER - Pune

"Where are my genes?" - A journey through the nucleus of a human cell

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"Where are my genes?" - A journey through the nucleus of a human cell

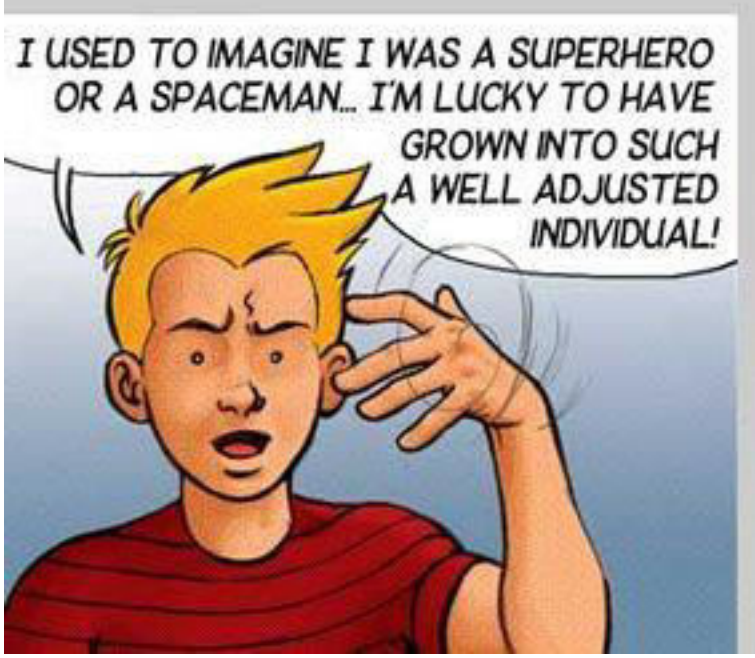
✗JEANS ✔GENES

"The Principal suspended me — School is the only place in the world where you can get time off for *bad* behavior."

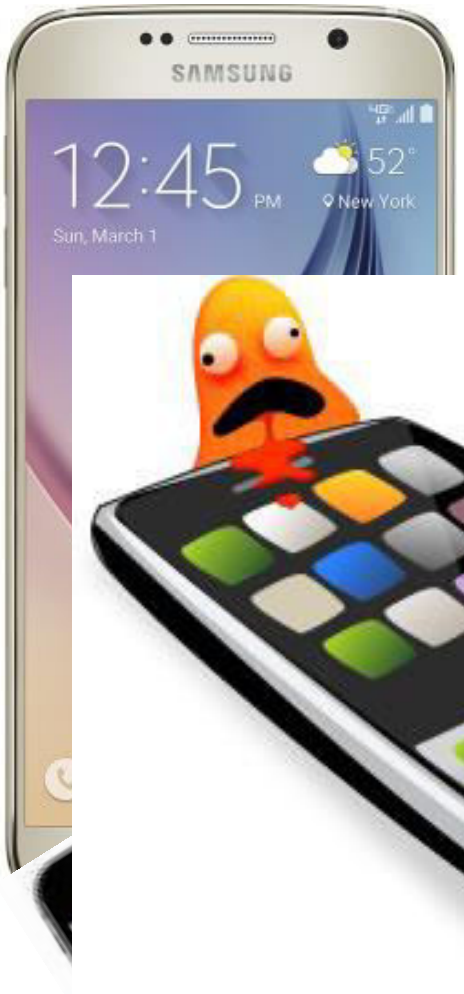
ALL GROWN UP

by KW

HTTP://KEVLEV.BLOGSPOT.COM



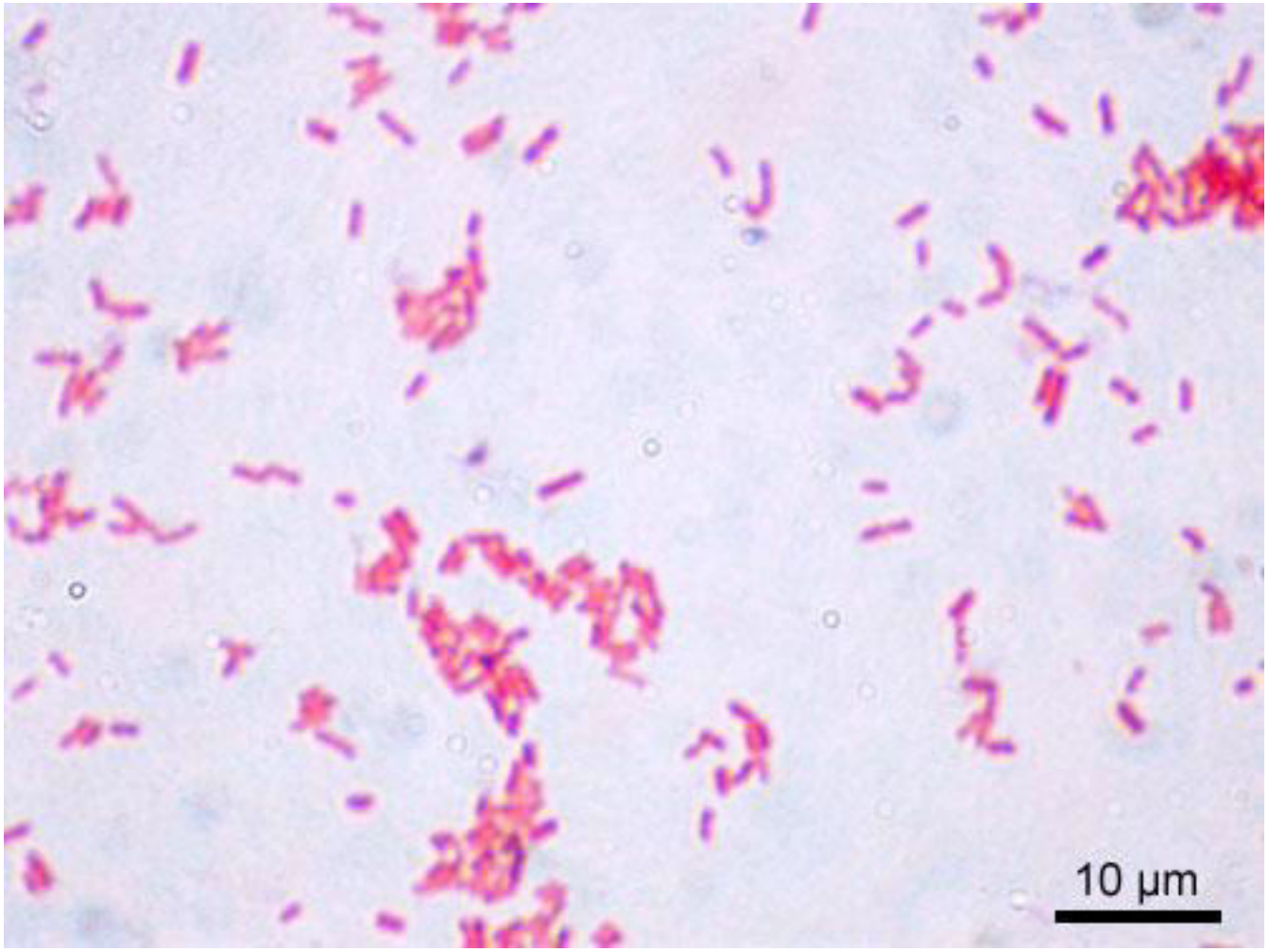
What is a cell?



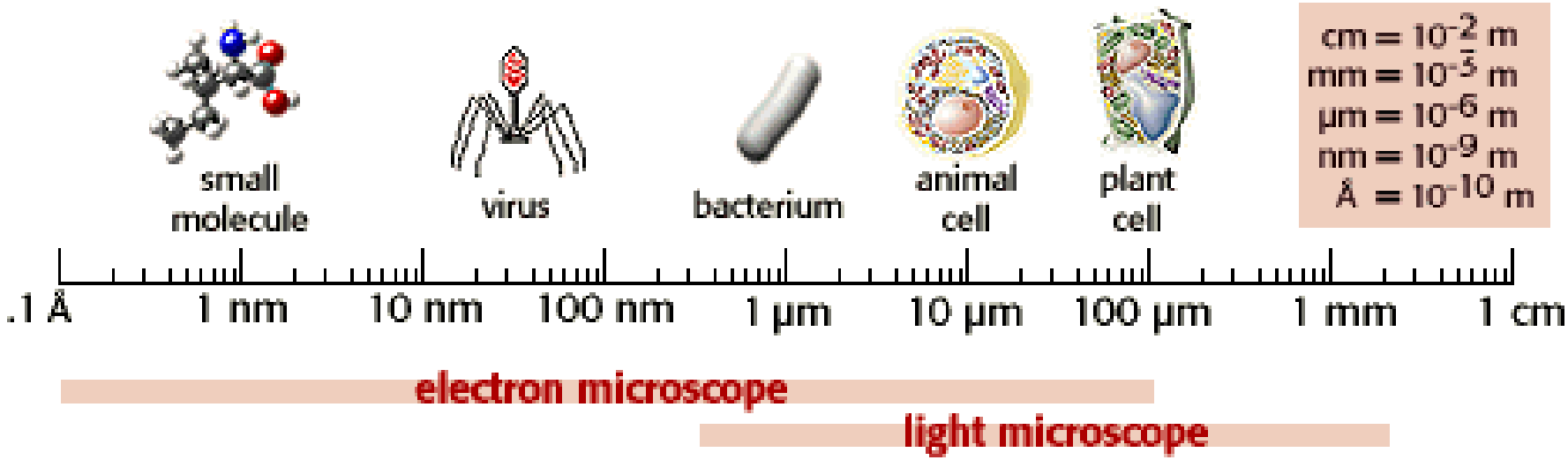
HOW MANY GERMS LIVE ON YOUR CELL PHONE?


25,000
GERMS
per square inch

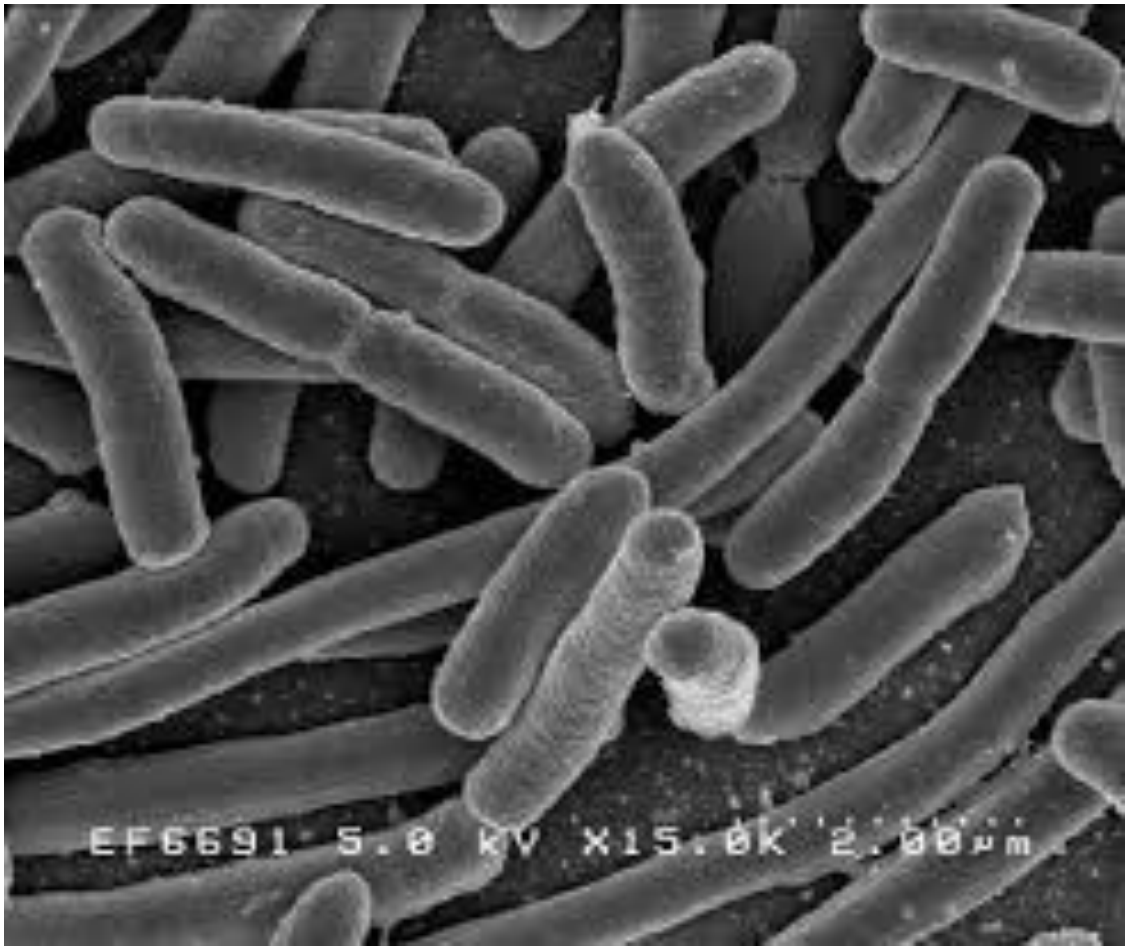
Bacterial cells



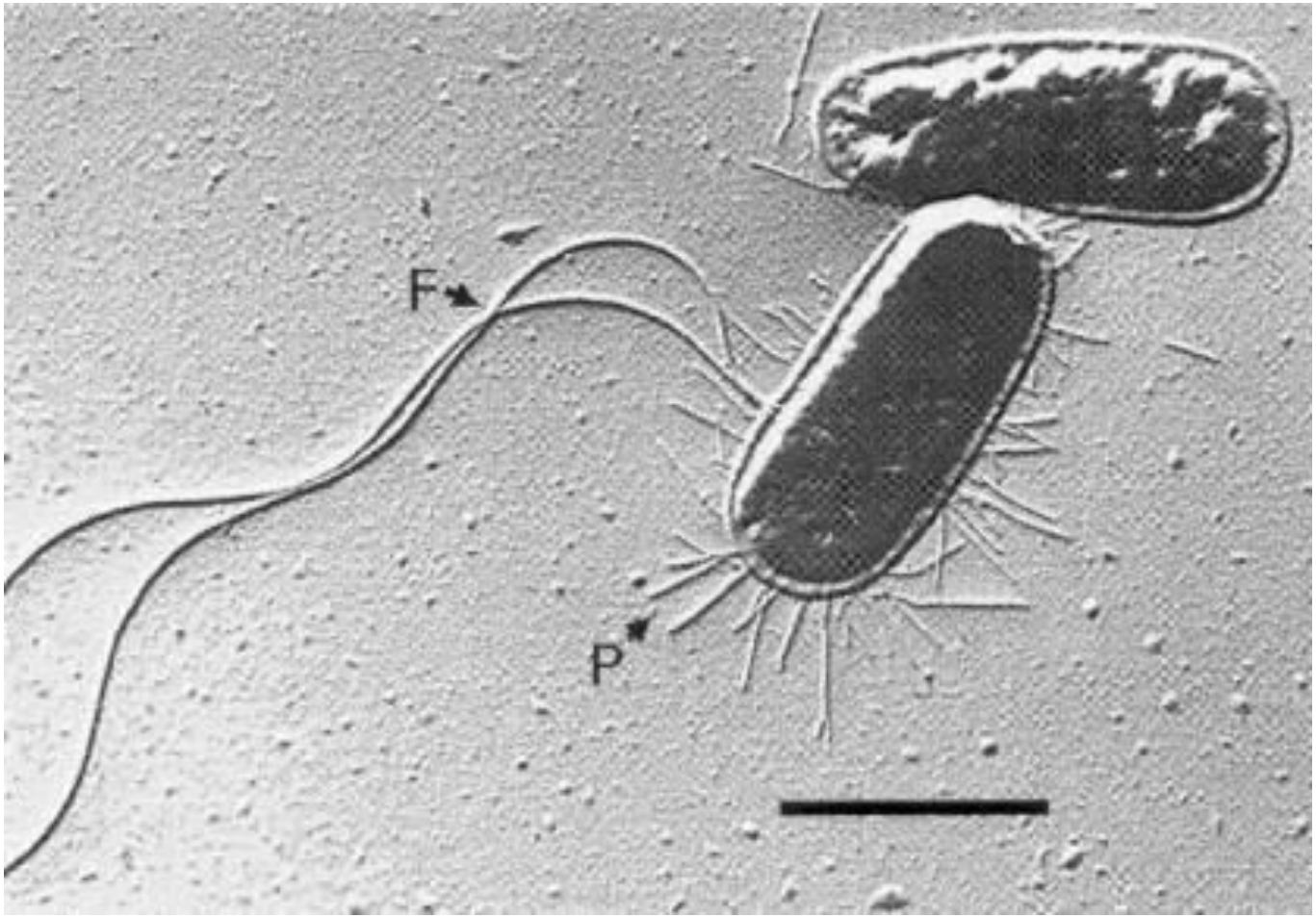
Size of cells



Bacterial cells visualized by scanning electron microscopy



Bacterial cells



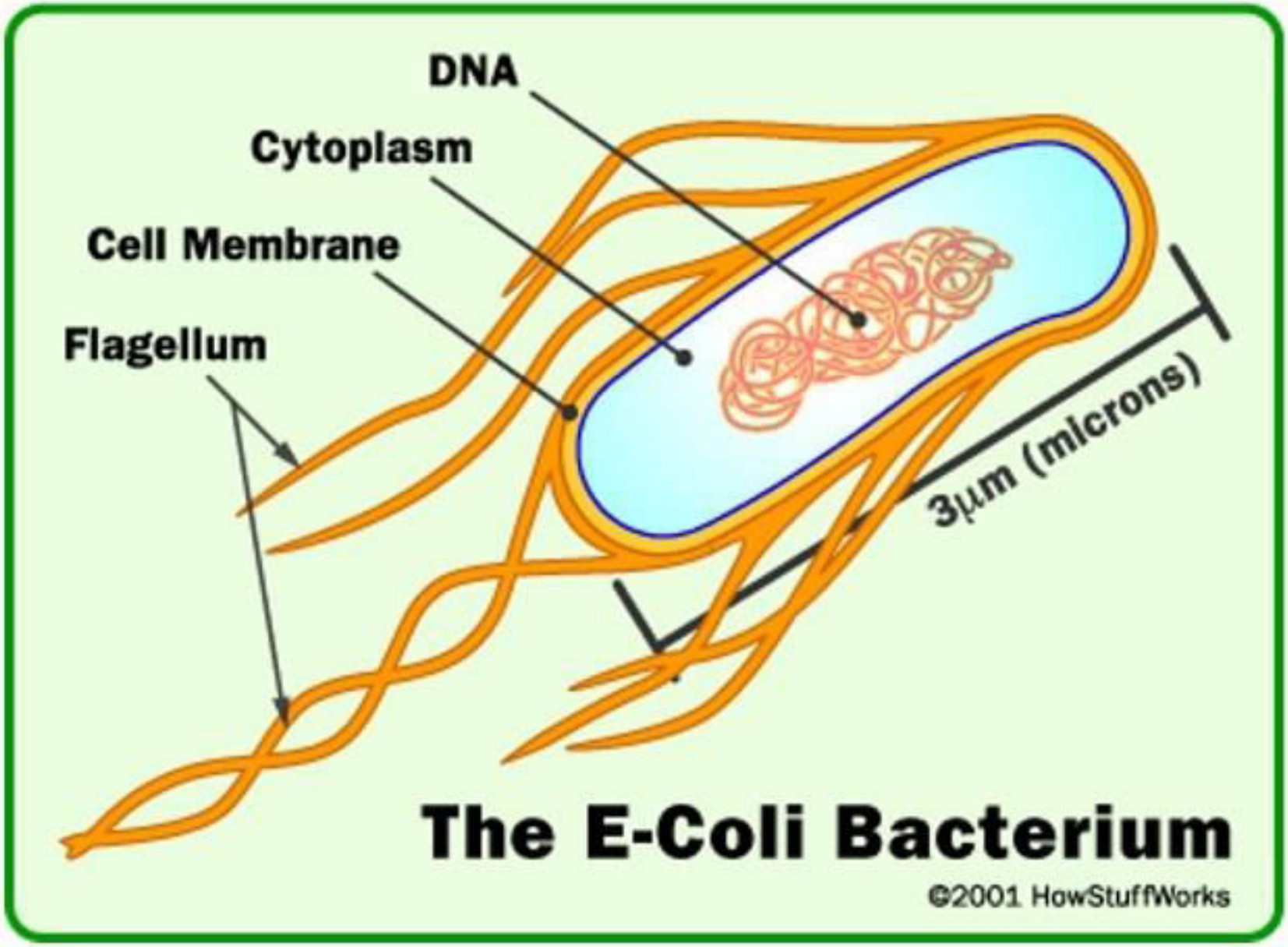
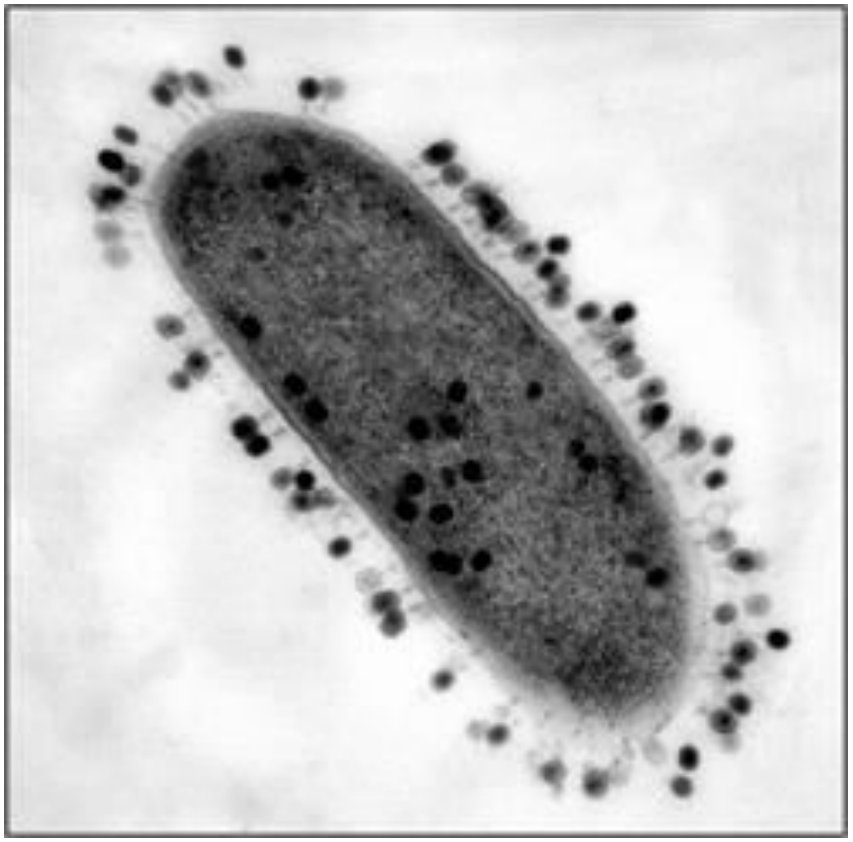
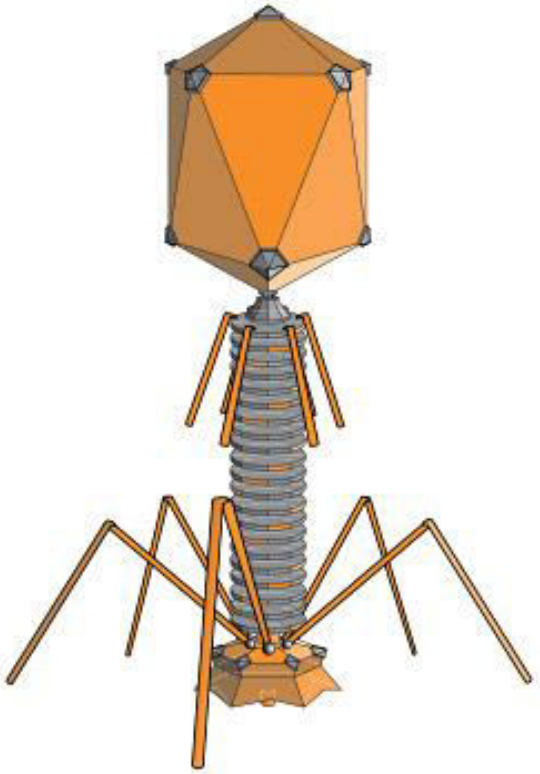


Figure 1. *E. coli* bacterium and its parts.

Bacteria and Bacterial virus (bacteriophage)

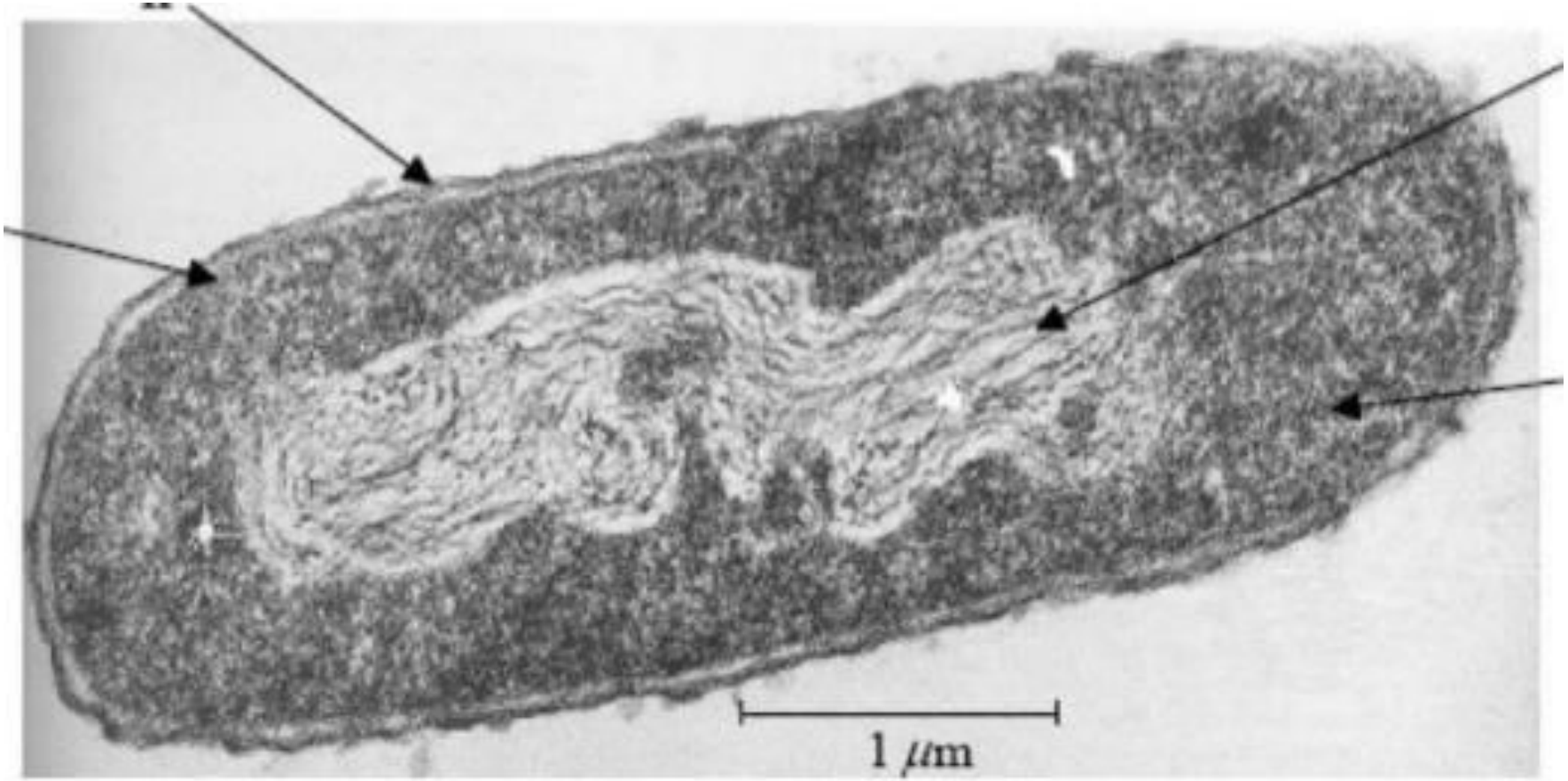


Size: 1 μm



Size: 6 nm

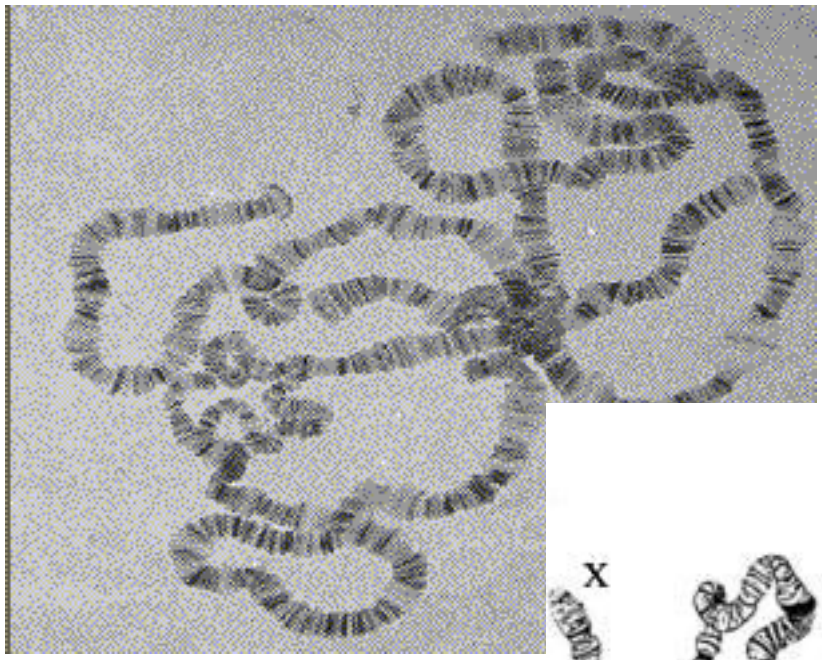
Bacteria and its DNA

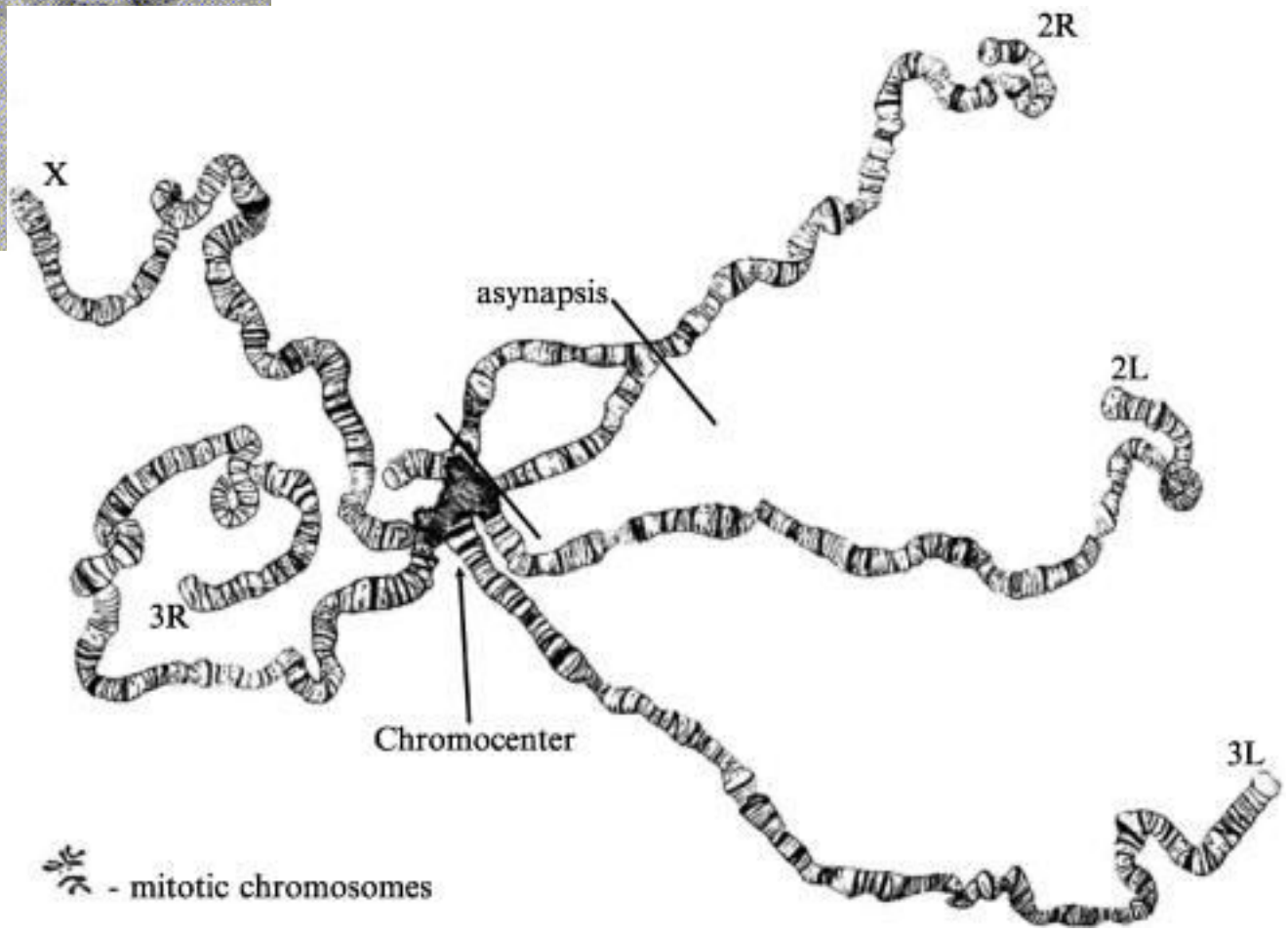


Drosophila melanogaster (Fruit Fly)

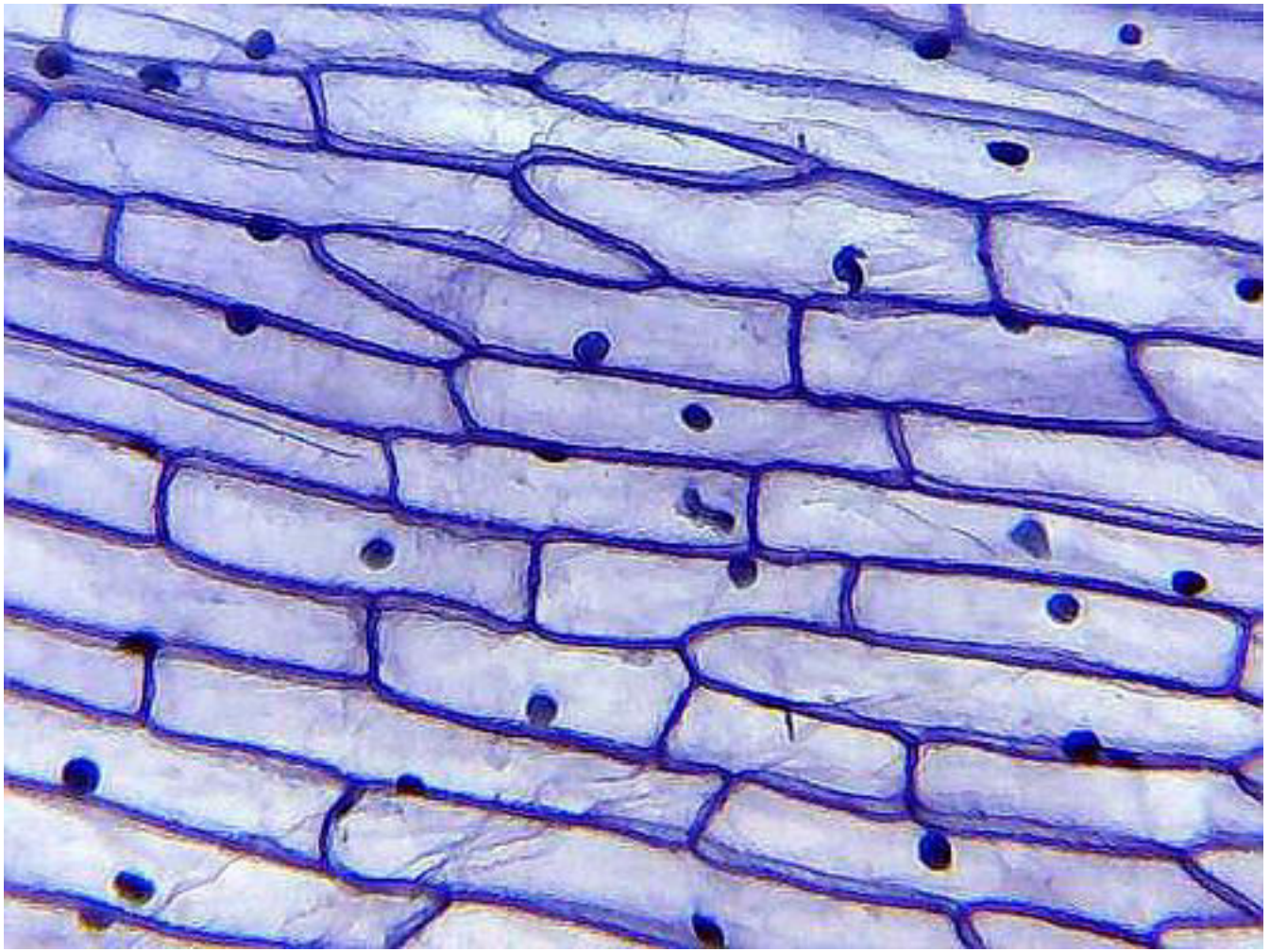
Size: 2.5 mm

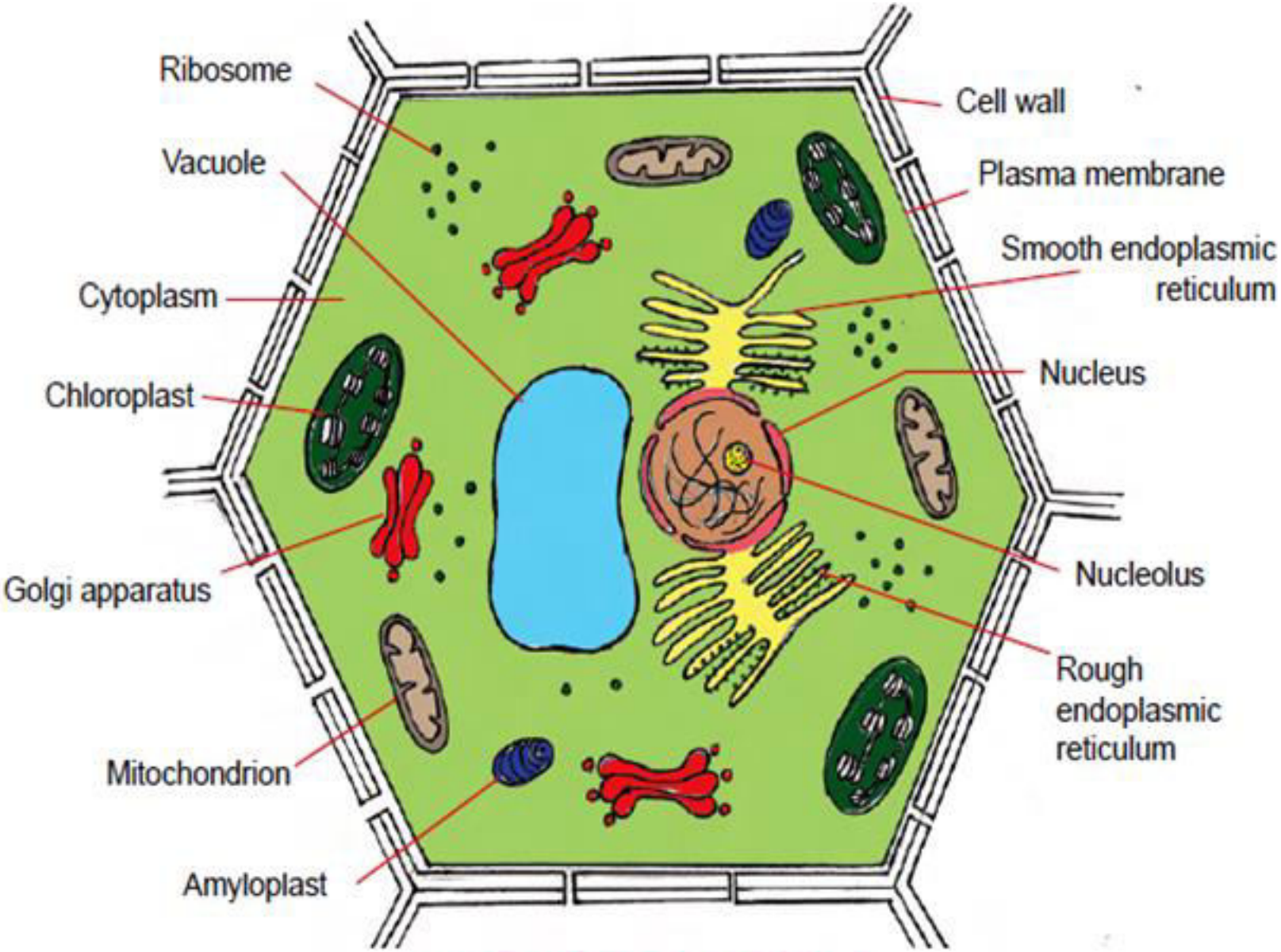
Fruit Fly chromosomes



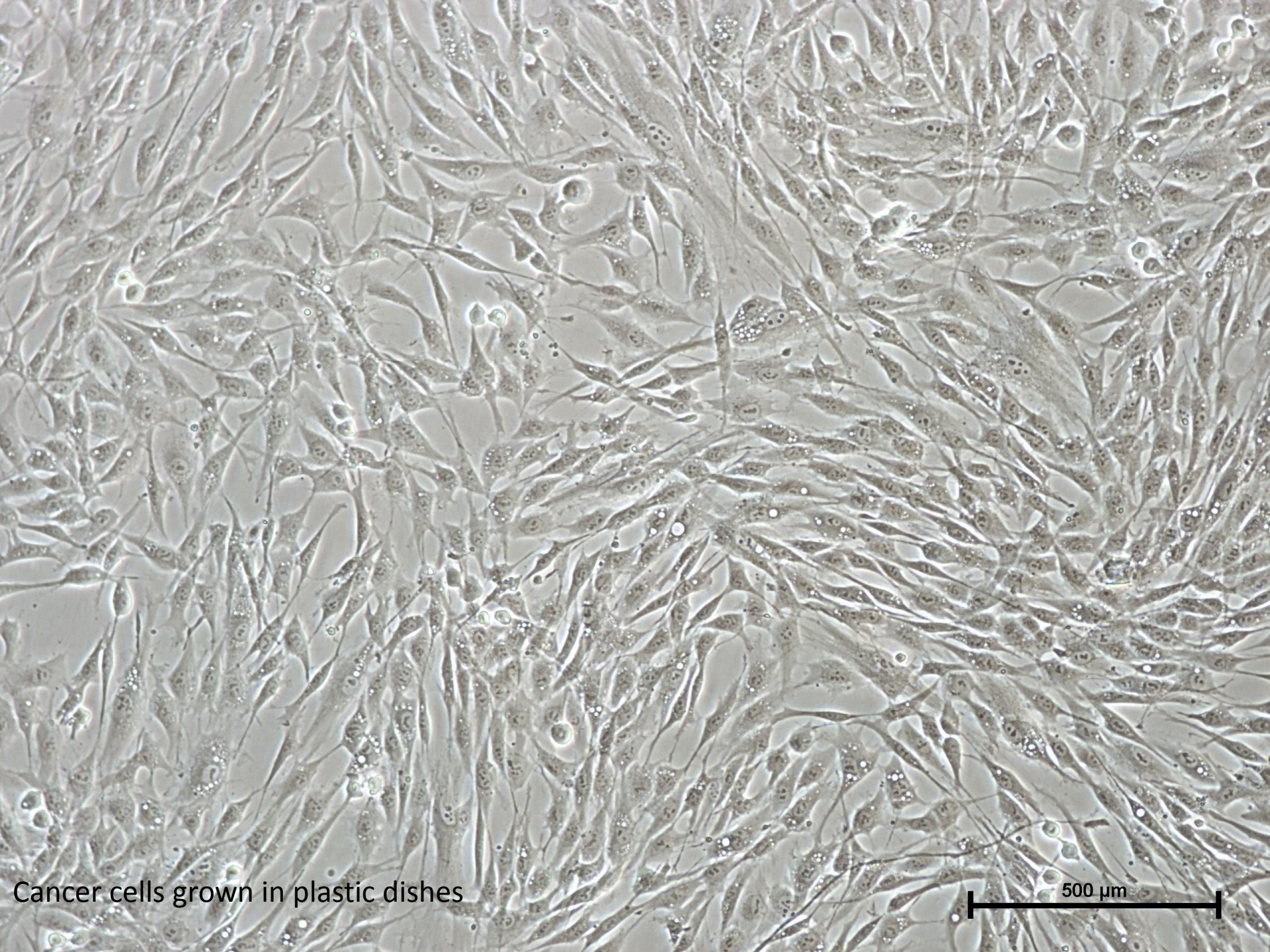


Onion peel cells

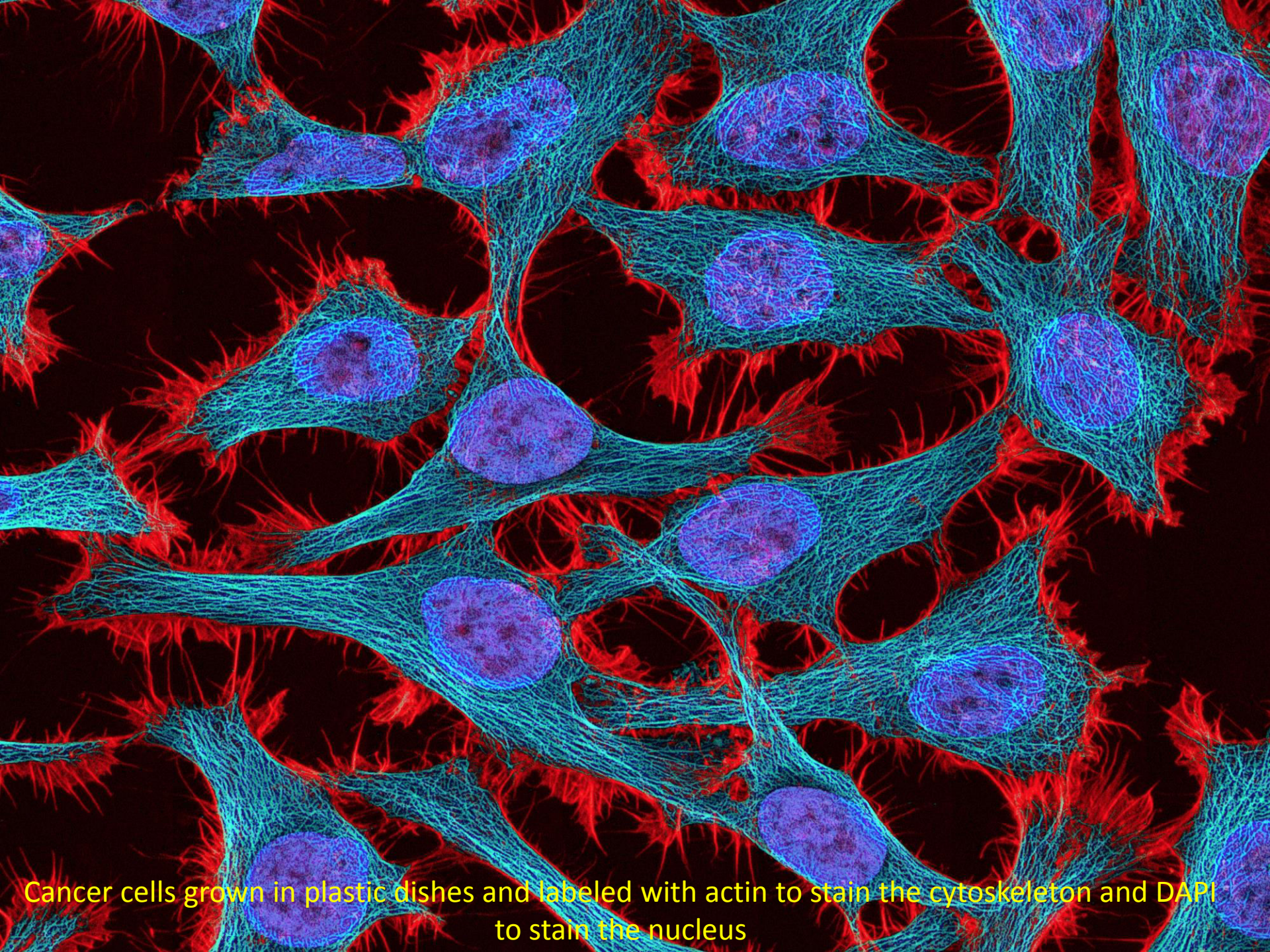




Ultra structure of a Plant cell

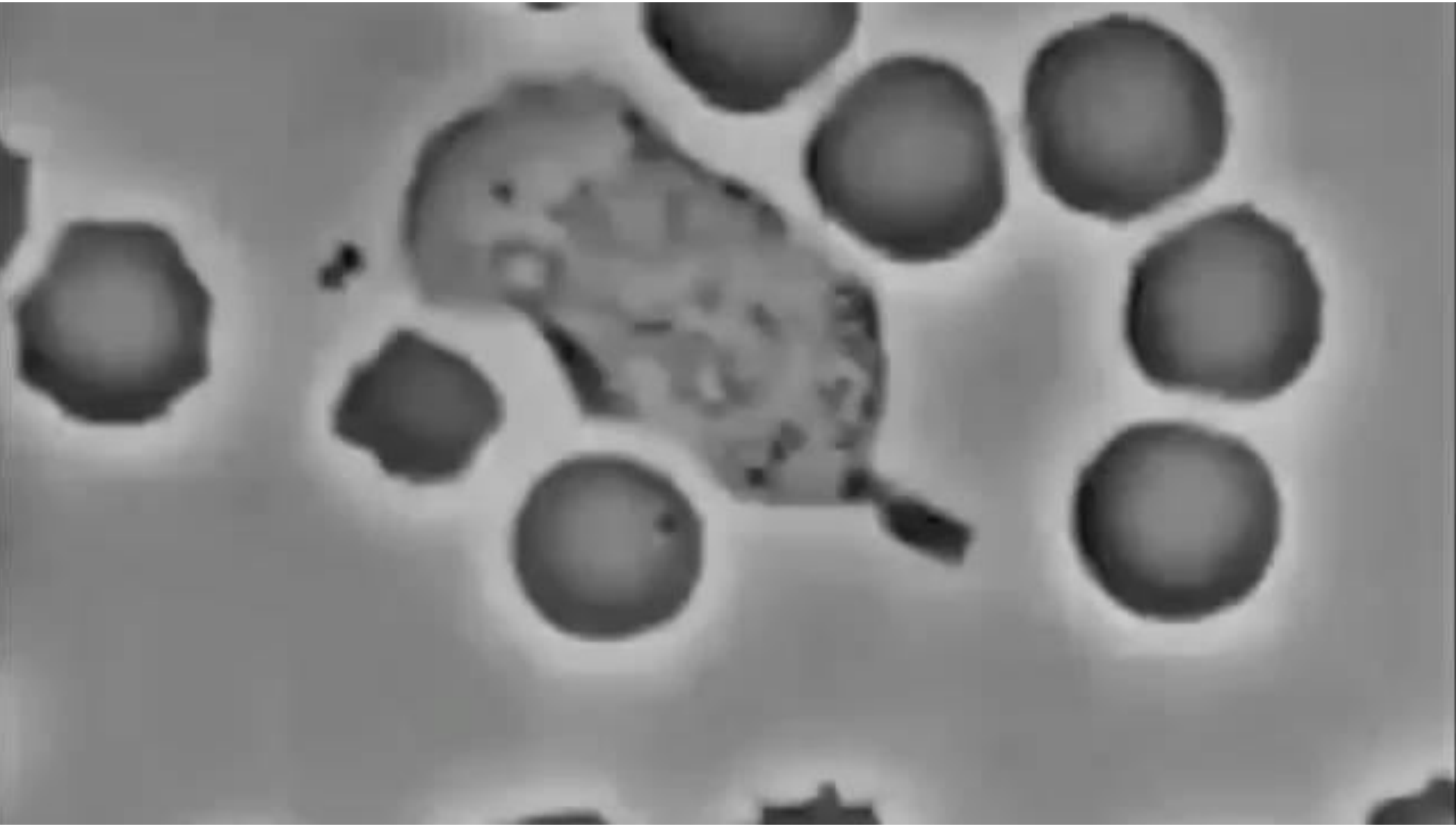


Cancer cells grown in plastic dishes



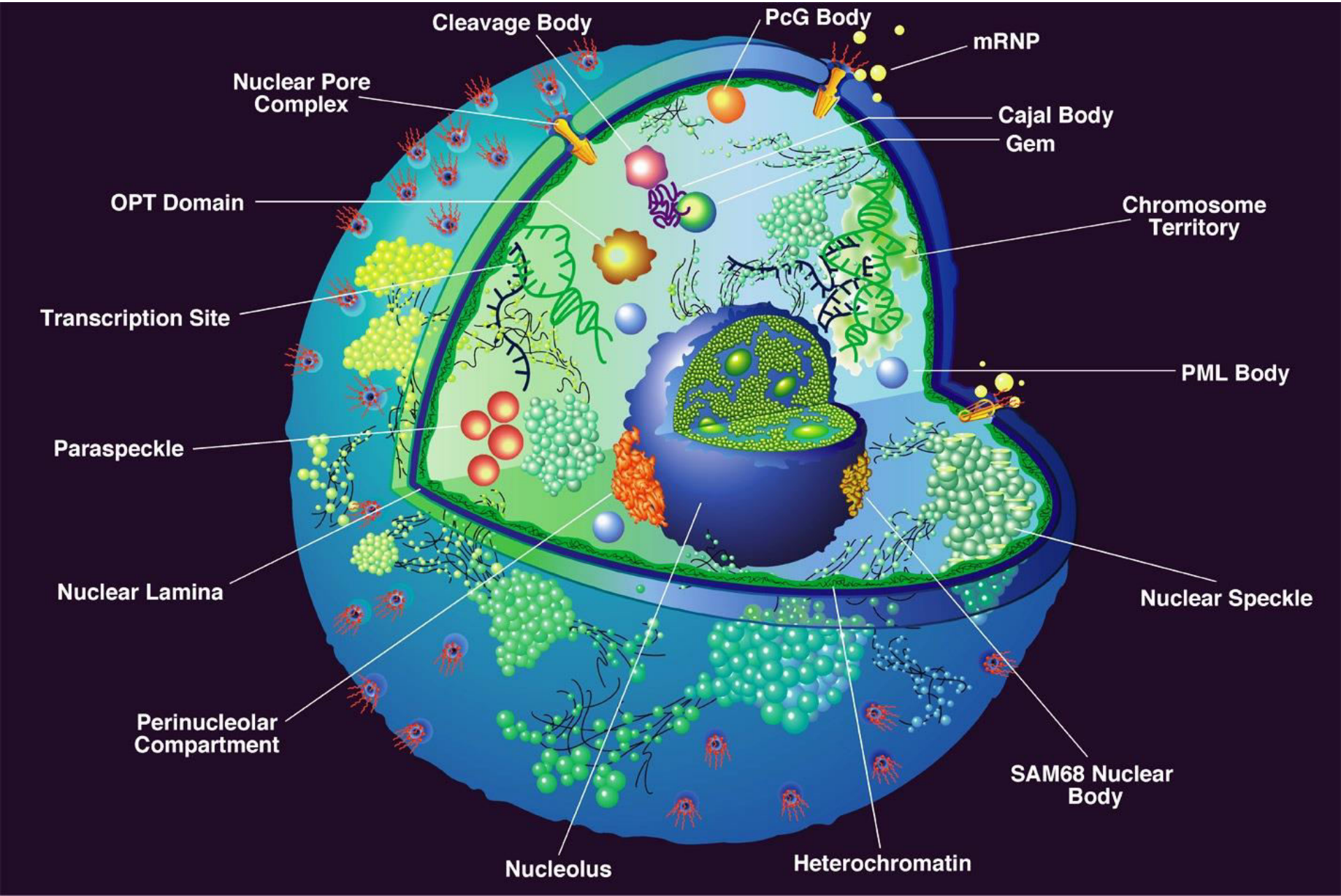
Cancer cells grown in plastic dishes and labeled with actin to stain the cytoskeleton and DAPI to stain the nucleus

Special cells in your body kill harmful bacteria

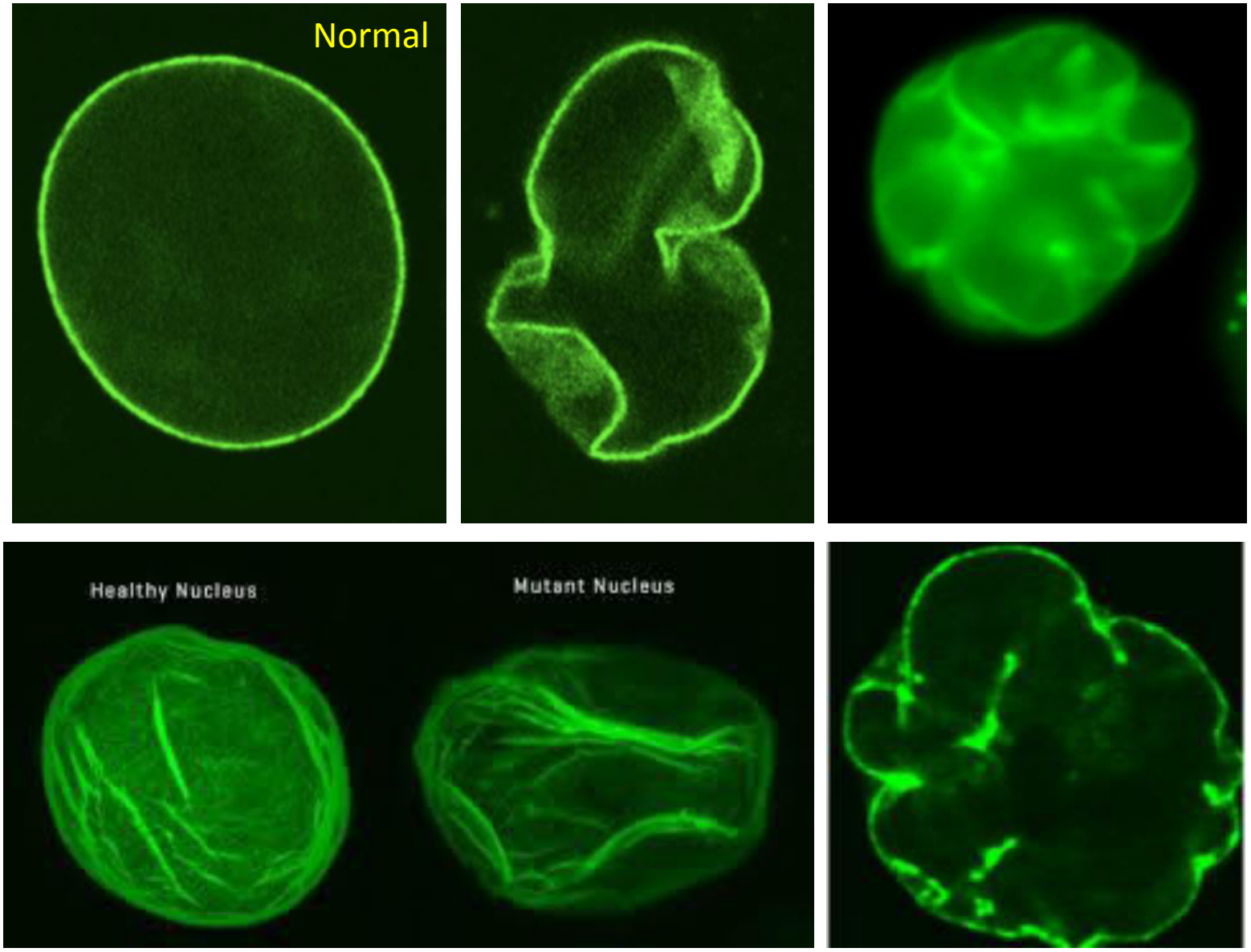


You tube link: https://www.youtube.com/watch?v=Z_mXDvZQ6dU

Nucleus

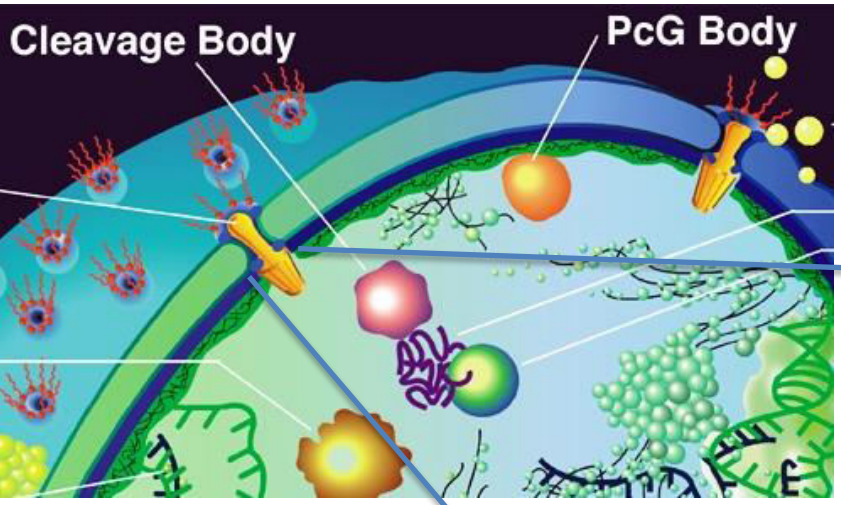

Cleavage Body
PcG Body
mRNP
Nuclear Pore Complex
Cajal Body
Gem
OPT Domain
Chromosome Territory
Transcription Site
PML Body
Paraspeckle
Nuclear Lamina
Nuclear Speckle
Perinucleolar Compartment
SAM68 Nuclear Body
Nucleolus
Heterochromatin

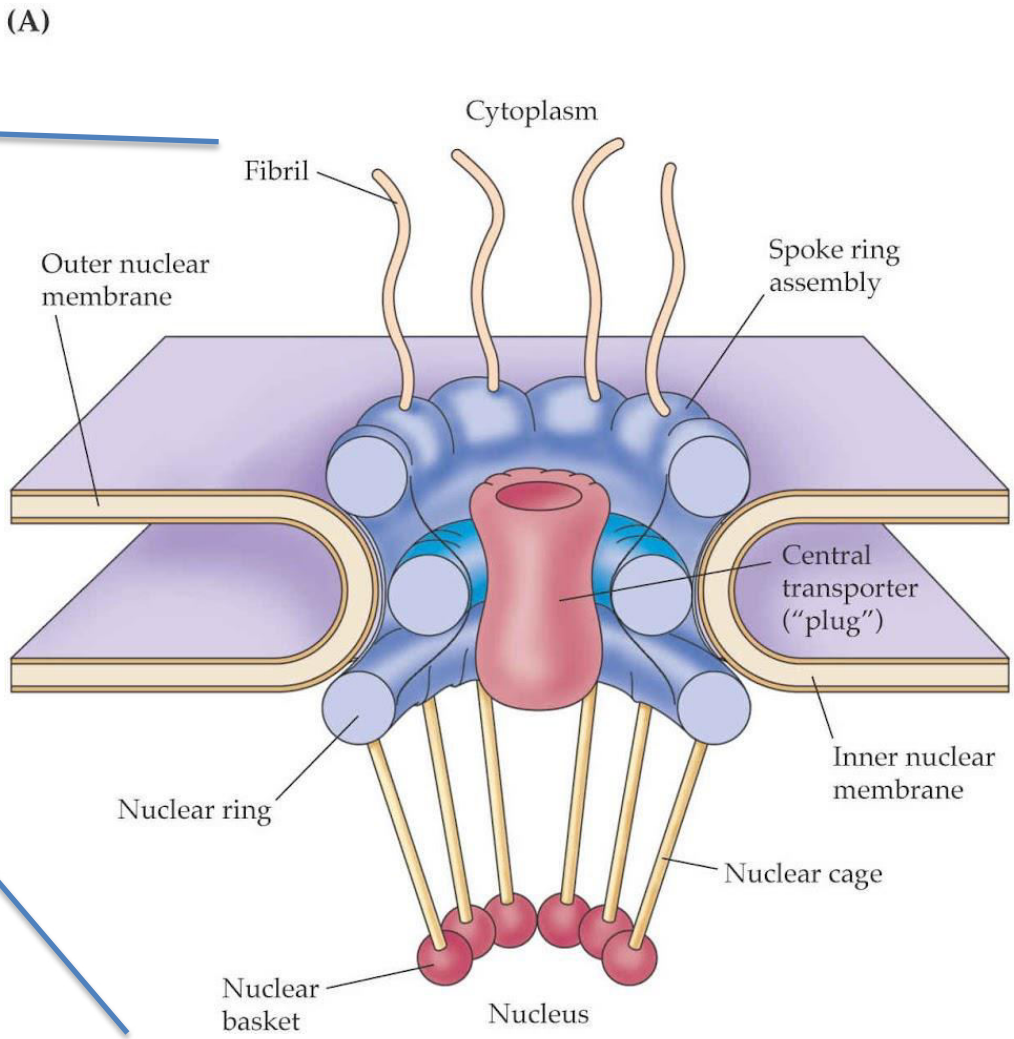
Lamins in normal and progeroid cells



Progeria is a rare disease caused when a protein in the nucleus does not function properly

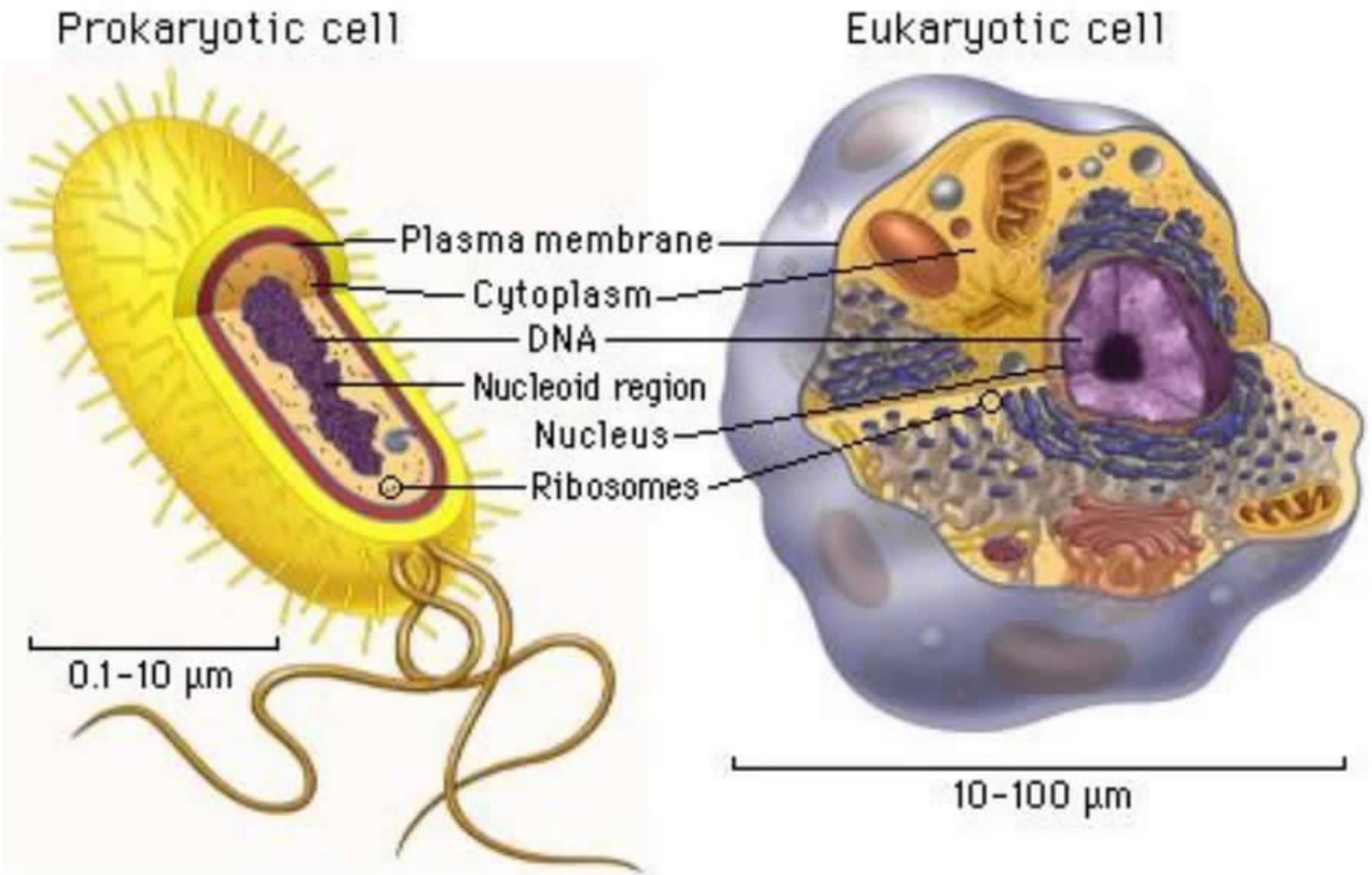
The nuclear pore controls the entry and exit of molecules into and out of the nucleus



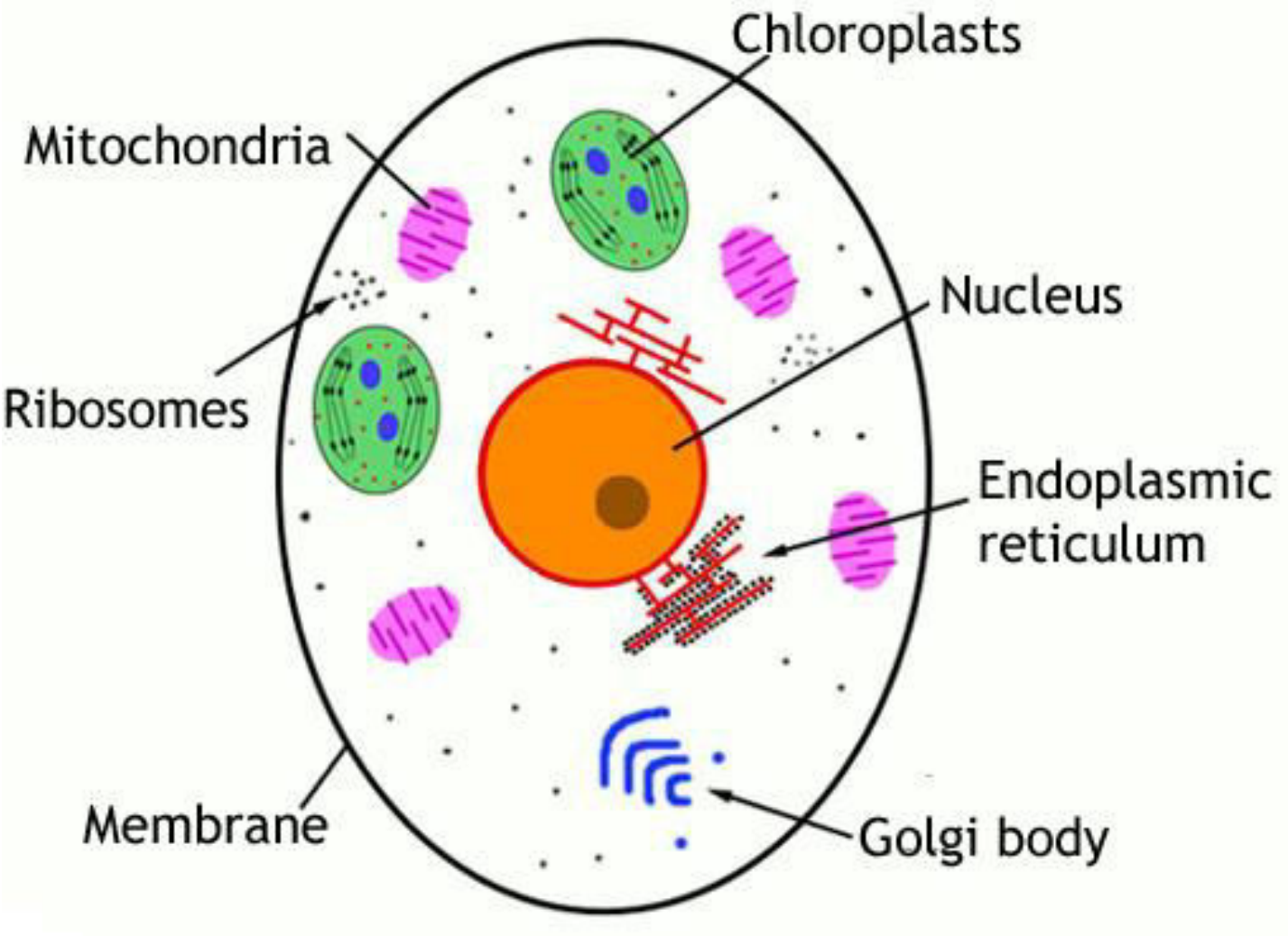


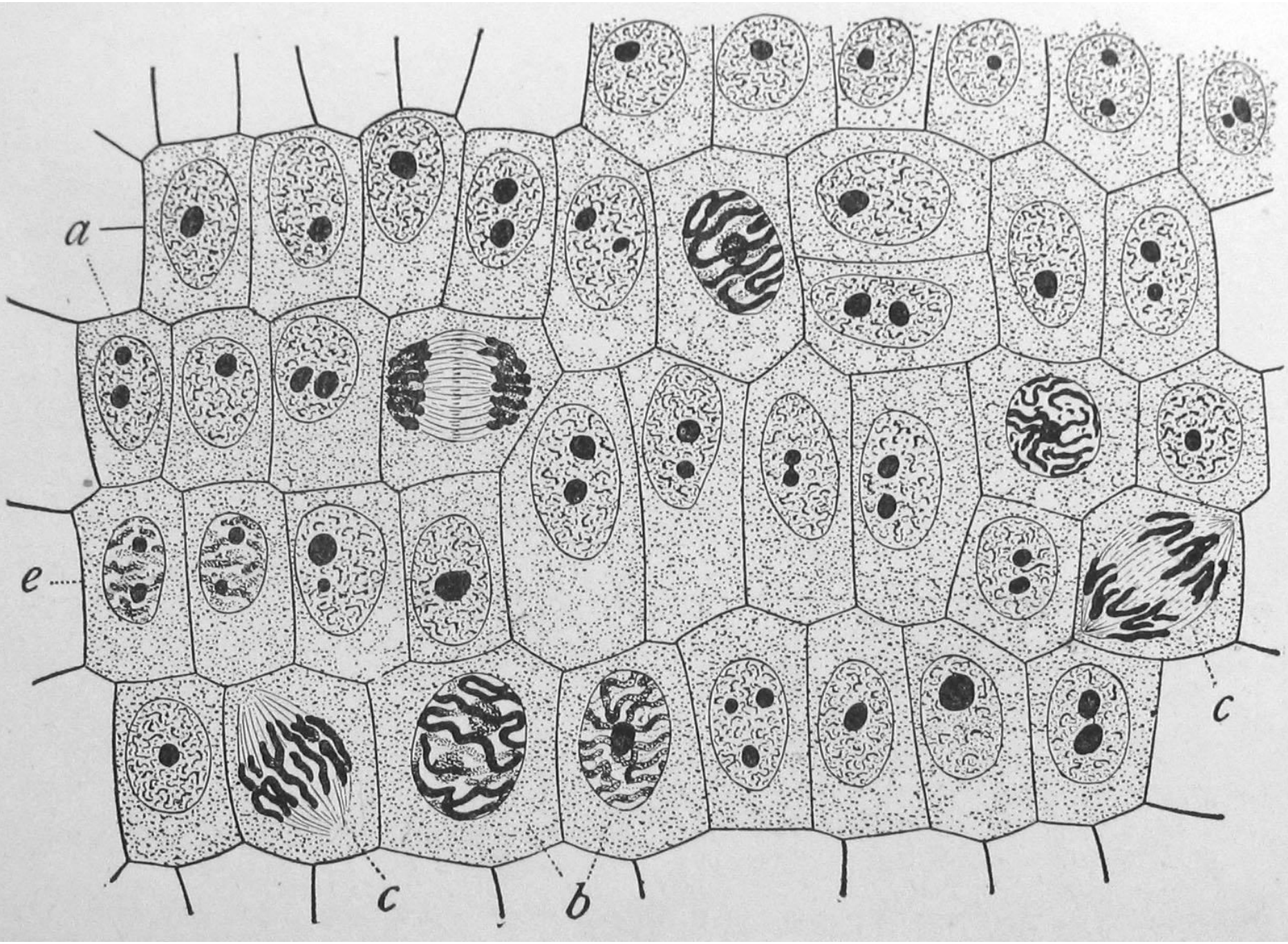
Bacteria

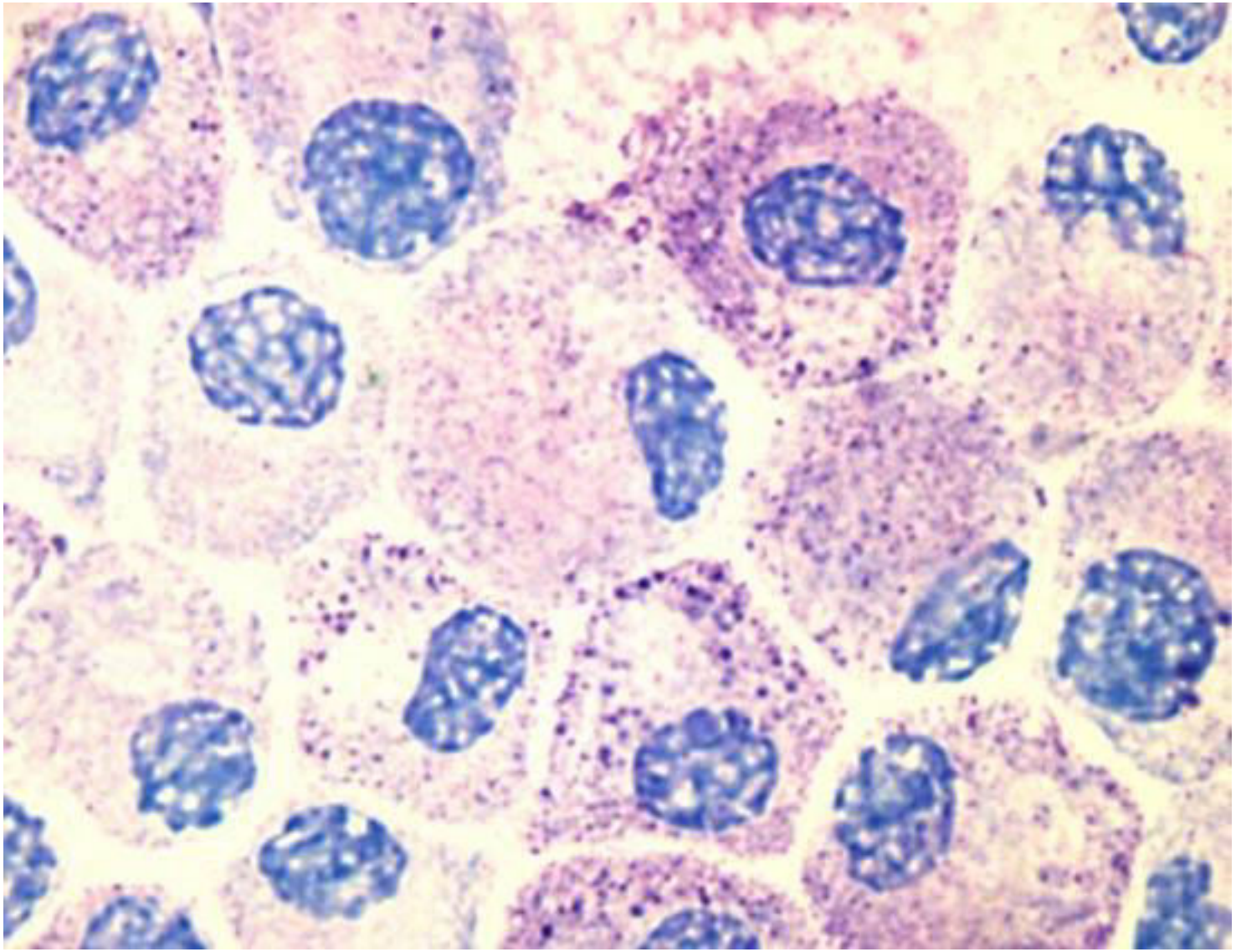
Human

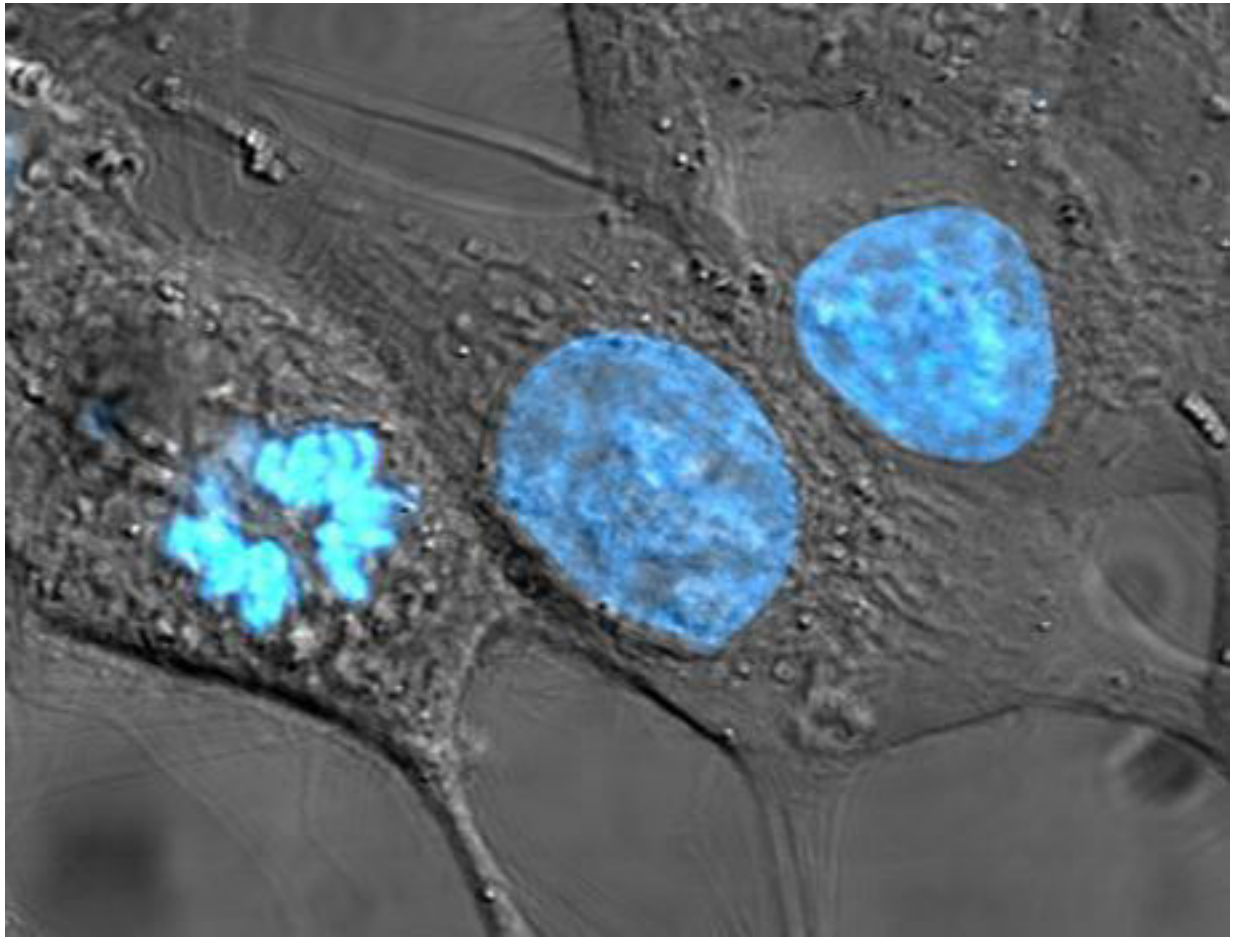


A Eukaryotic cell

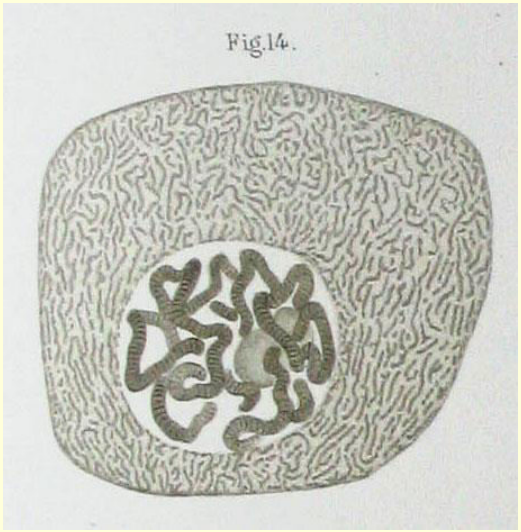


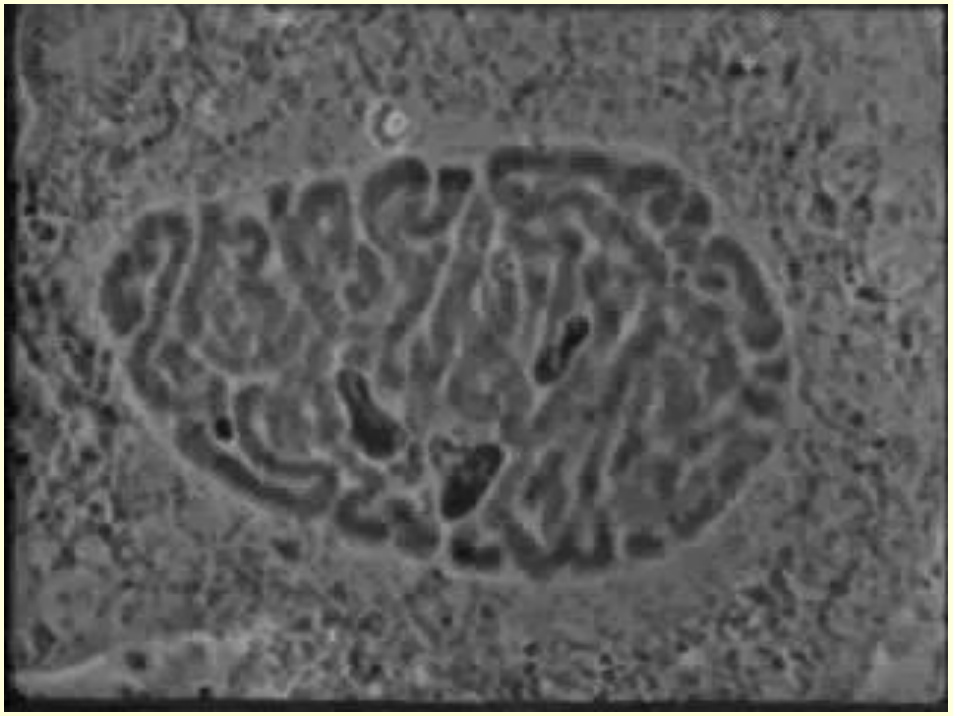

a
e
c
c
b



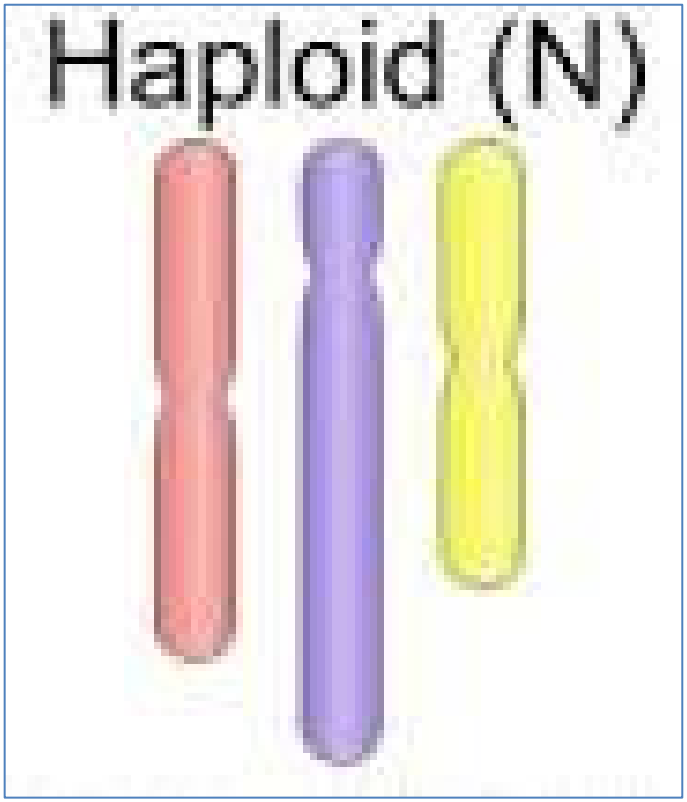


What happens to chromosomes in cells ?



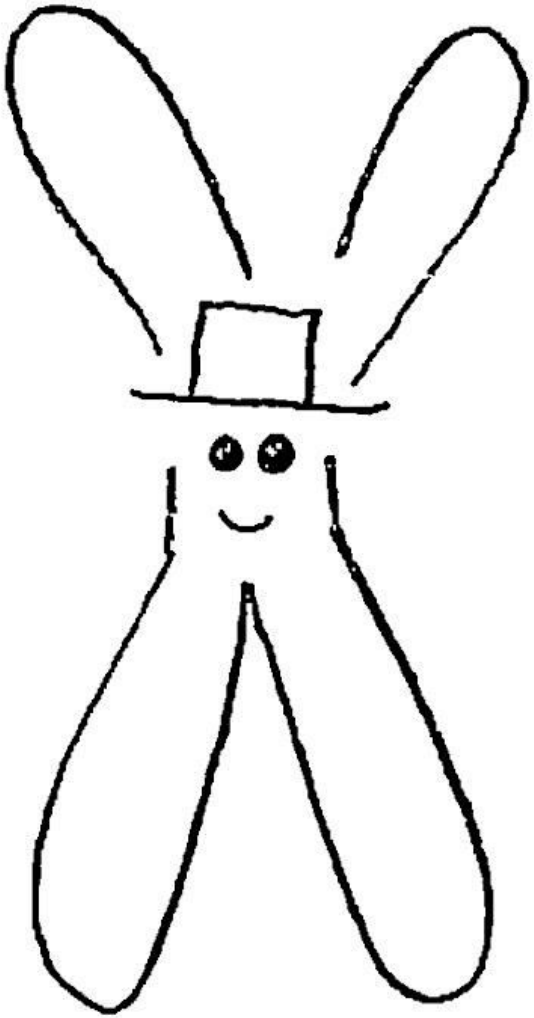


Youtube link: https://www.youtube.com/watch?v=aDAw2Zg4IgE


Haploid (N)


Diploid (2N)

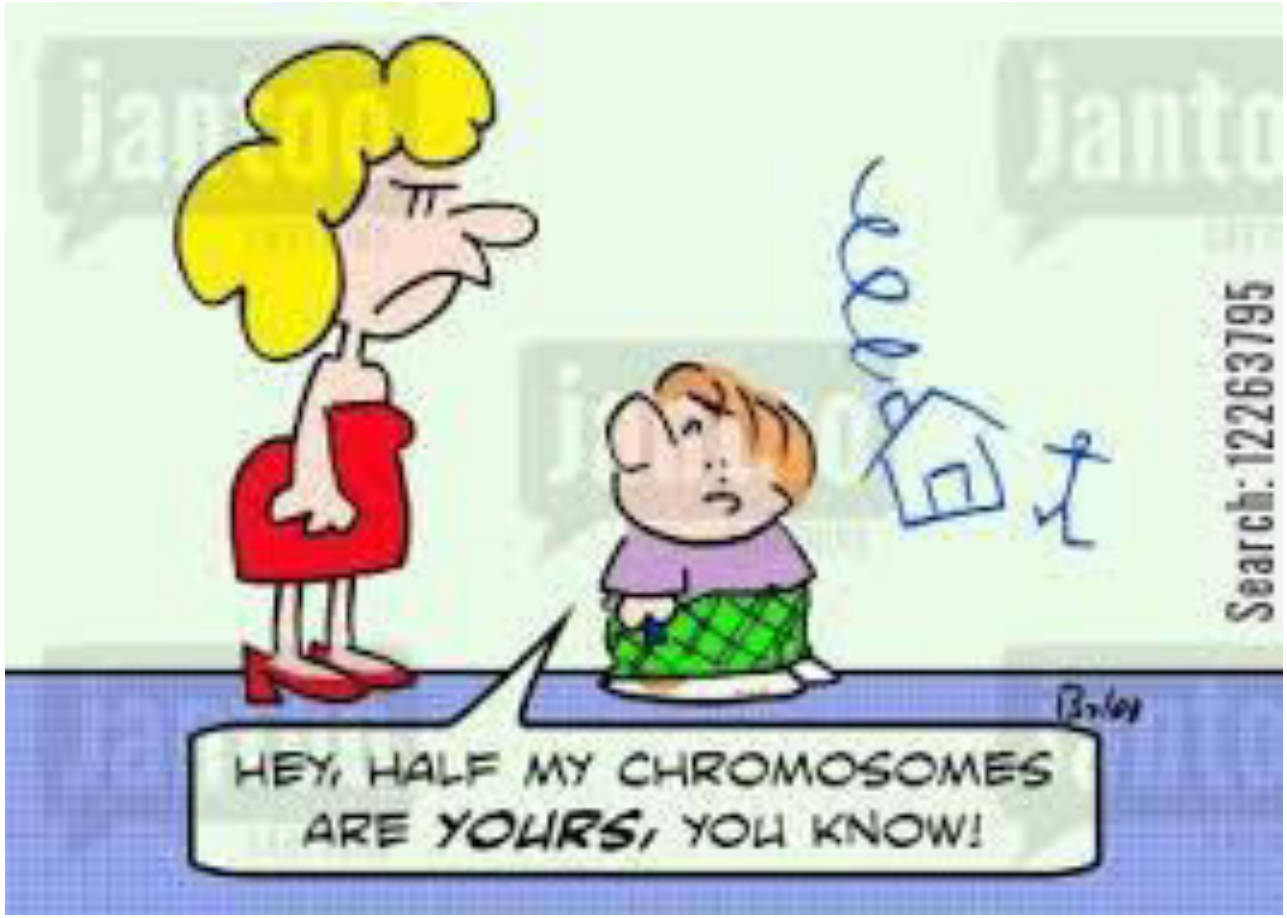
XY



one from dad

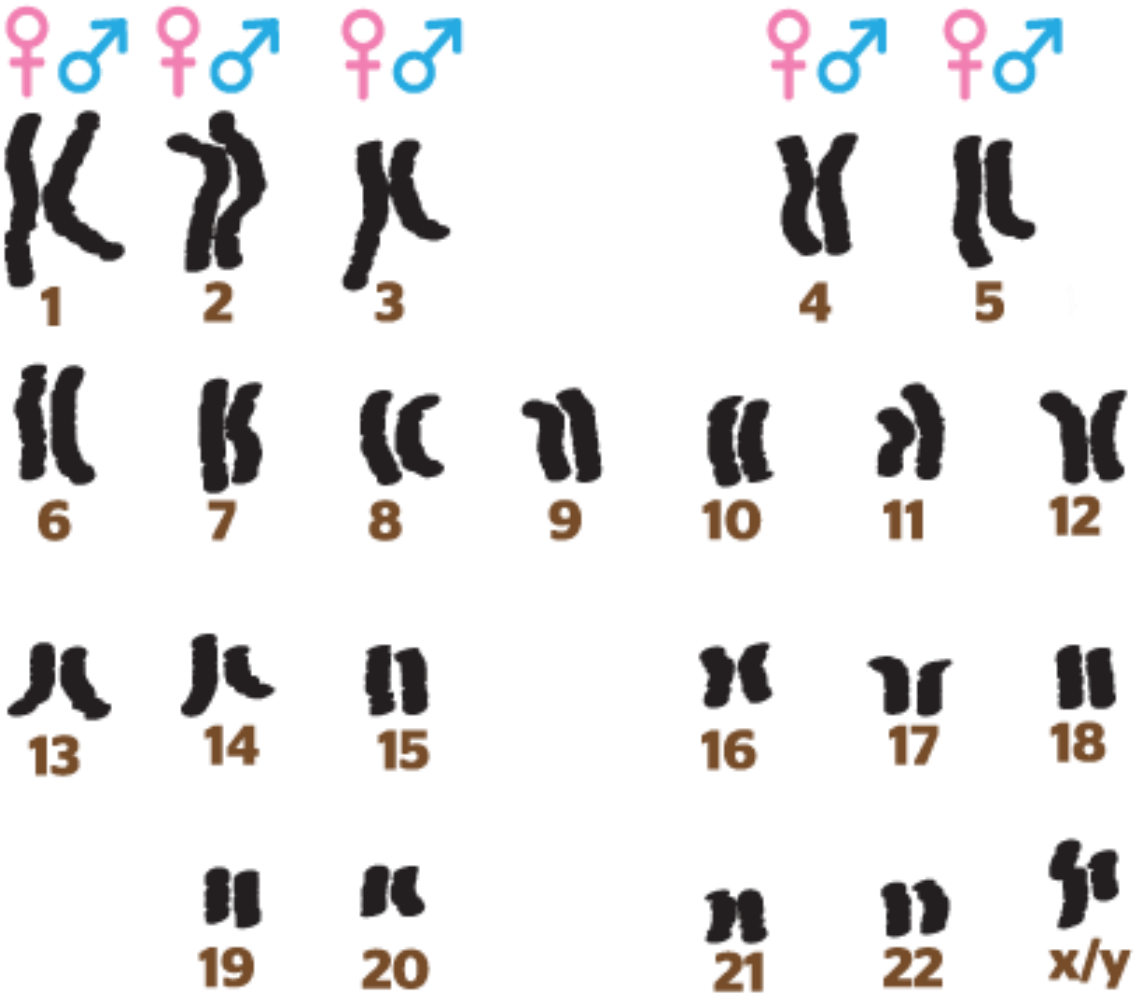
XX

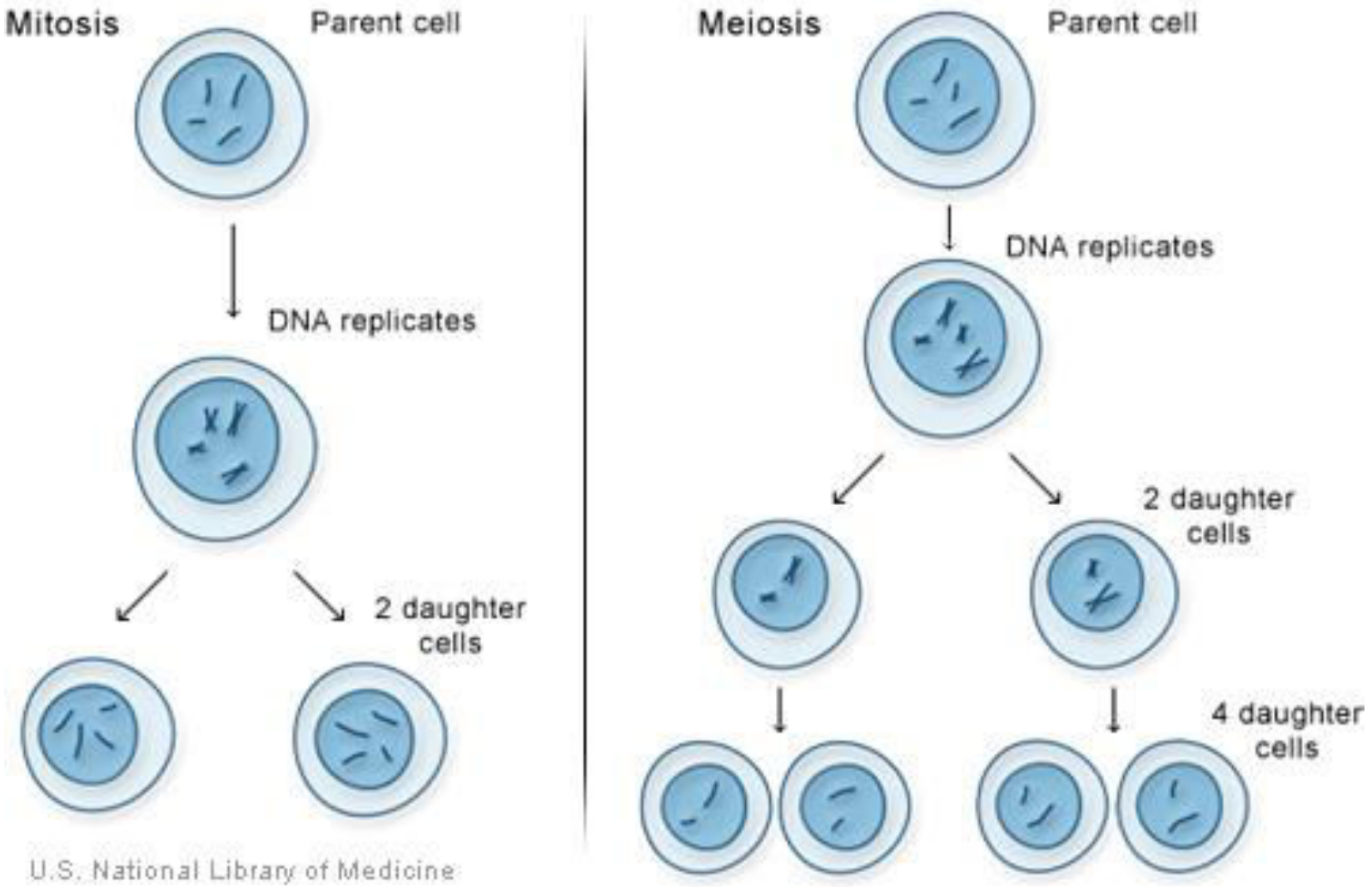
one from mom


HEY, HALF MY CHROMOSOMES ARE YOURS, YOU KNOW!
Search: 12263795

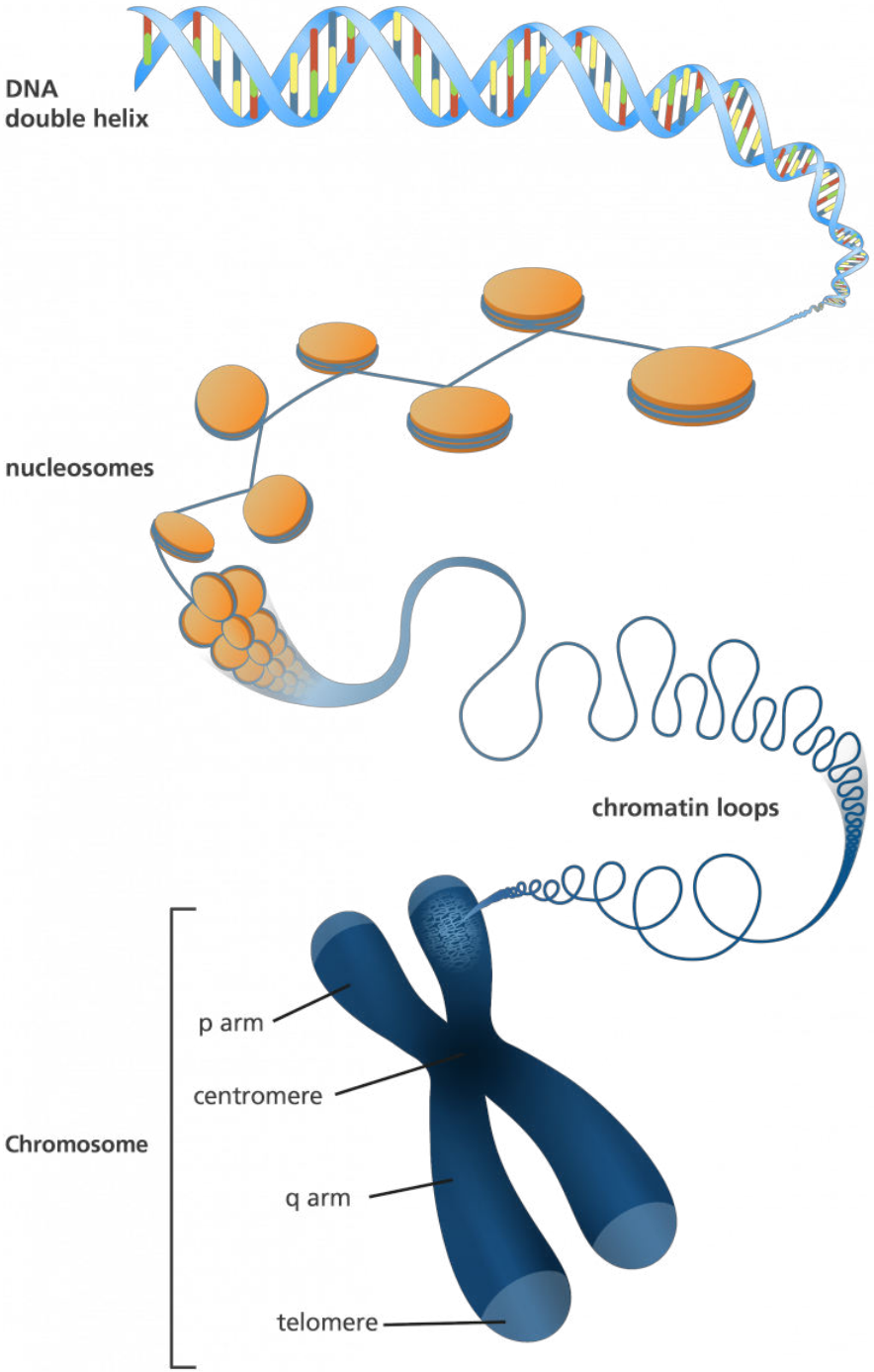

IT'S YOUR FAULT WE DIDN'T HAVE A SWEET LITTLE GIRL! YOUR STUPID CHROMOSOME!! NOT MINE!!

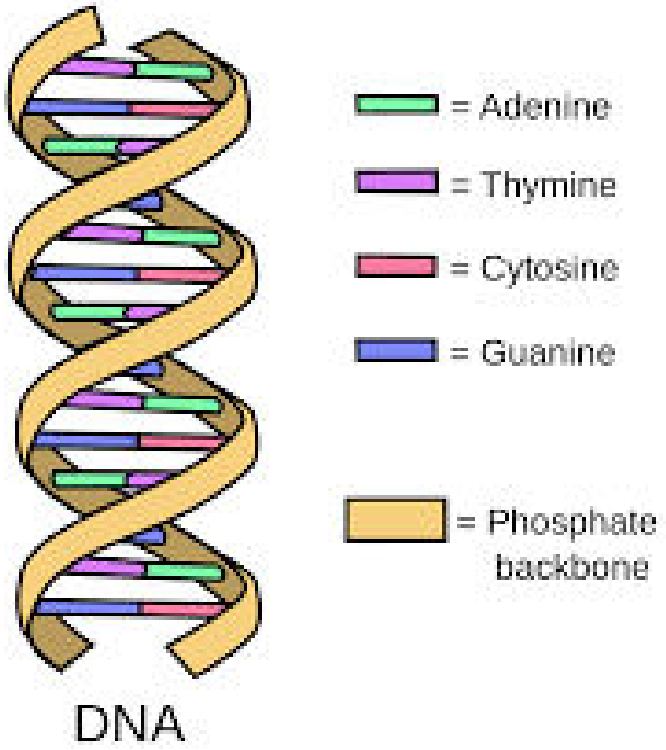

BAM! BAM! BAM!
BECAUSE!!
BECAUSE!!
BECAUSE!!
THAT PESKY "WHY" CHROMOSOME.

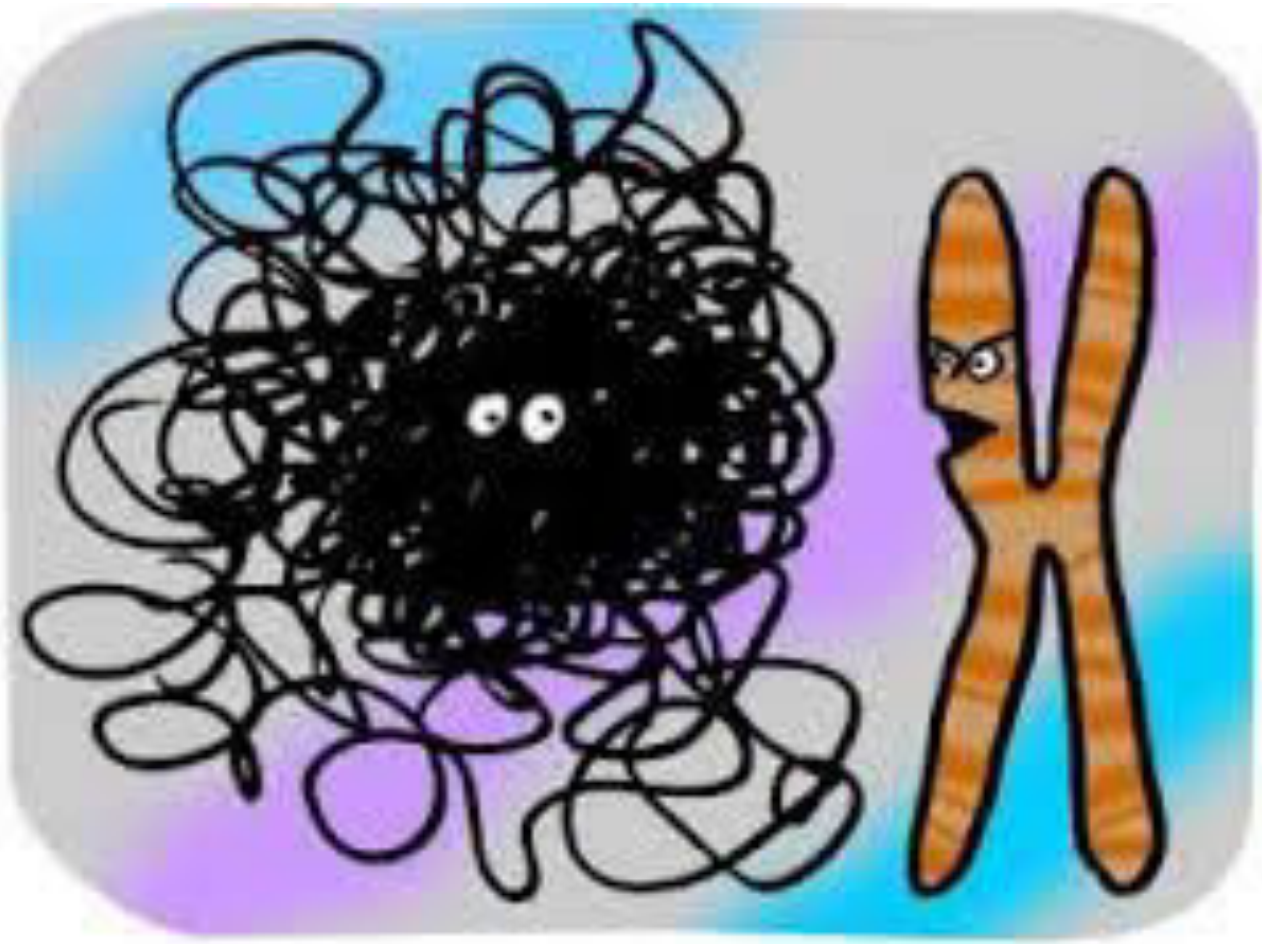

♀♂ ♀♂ ♀♂ ♀♂ ♀♂
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18
19 20 21 22 x/y



U.S. National Library of Medicine

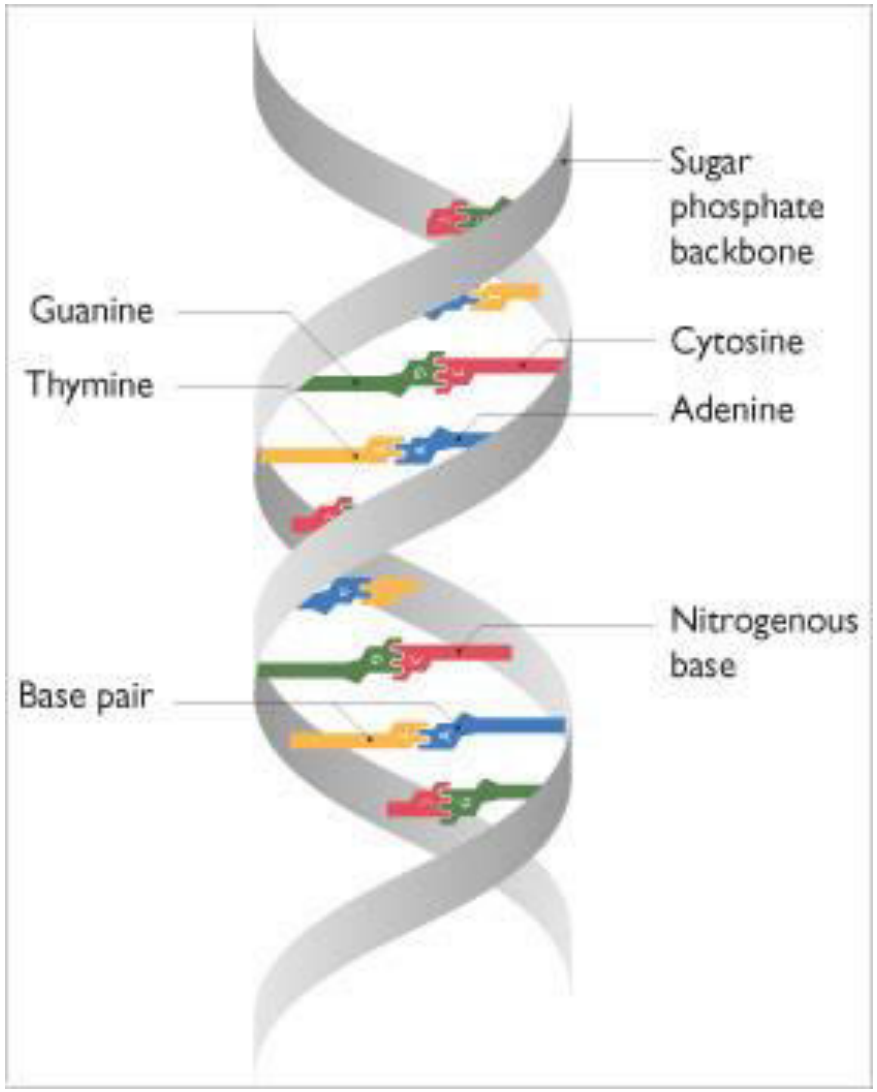

DNA
double helix
nucleosomes
chromatin loops
Chromosome
p arm
centromere
q arm
telomere


= Adenine
= Thymine
= Cytosine
= Guanine
= Phosphate backbone
DNA



Dude, mitosis starts in 5 minutes, I can’t believe you are not condensed as yet

DNA – Double Helix




8FACT
If your DNA was
to be stretched out,
it would go from
the earth to the moon
and back 6,000 times.
8FACT.COM

Discoverers of the DNA double helix

James Watson, Francis Crick

Rosalind Franklin