The Cell:

Basis of Neuron

The Link:

Nerve - Neuron Cell – Ions - Electricity

READINGS:

Textbooks:

Neuroengineering, by D. DiLorenzo, J. Bronzino, CRC Press, Boca Raton, 2008.

Brain Mapping: The Methods, by Arthur Toga and John Maziotta. 2002. Academic Press, New York.

Neuroinformatics, by C Crasto and S. Koslow. Humana Press, New York.

Molecular Cell Biology, by H Lodish, A Nerk. Freeman & Co., San Francisco.

Statistics in Medicine, by Robert Riffenburgh, Academic Press, London. 2012.

Biodesign: The process of Innovating Medical Technology, by S. Zenios, J. Makower, P. Yock, Cambridge University Press, Cambridge. 2010.

Reference Books:

Cognitive Science: An Introduction to the Science of the Mind, by J. L. Bermudez, Cambridge University Press, Cambridge. 2010.

Information Theory and The Brain, by R. Baddeley, P. Hancock, P. Foldiac, Cambridge University Press, Cambridge. 2000.

Principles of Neural Science, by Eric Kandel, James Schwartz, Thomas Jessel, McGraw-Hill Publishers, New York, 2012.,

Handbook of Functional Neuroimaging of Cognition, by R. Cabeza, A. Kingstone, Second edition, MIT Press, Boston, 2006.

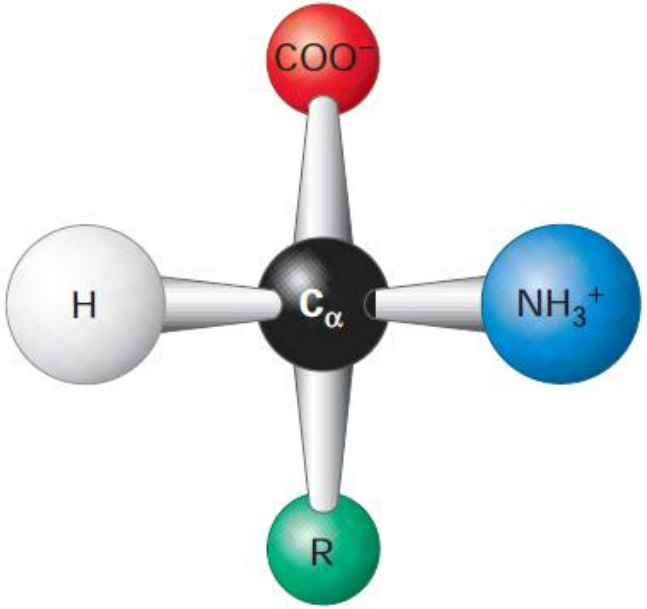
Mind, Brain, & Education: Neuroscience Implications for the Classroom, by David Sousa. 2010. Solution Tree Educational Press, Bloomington.

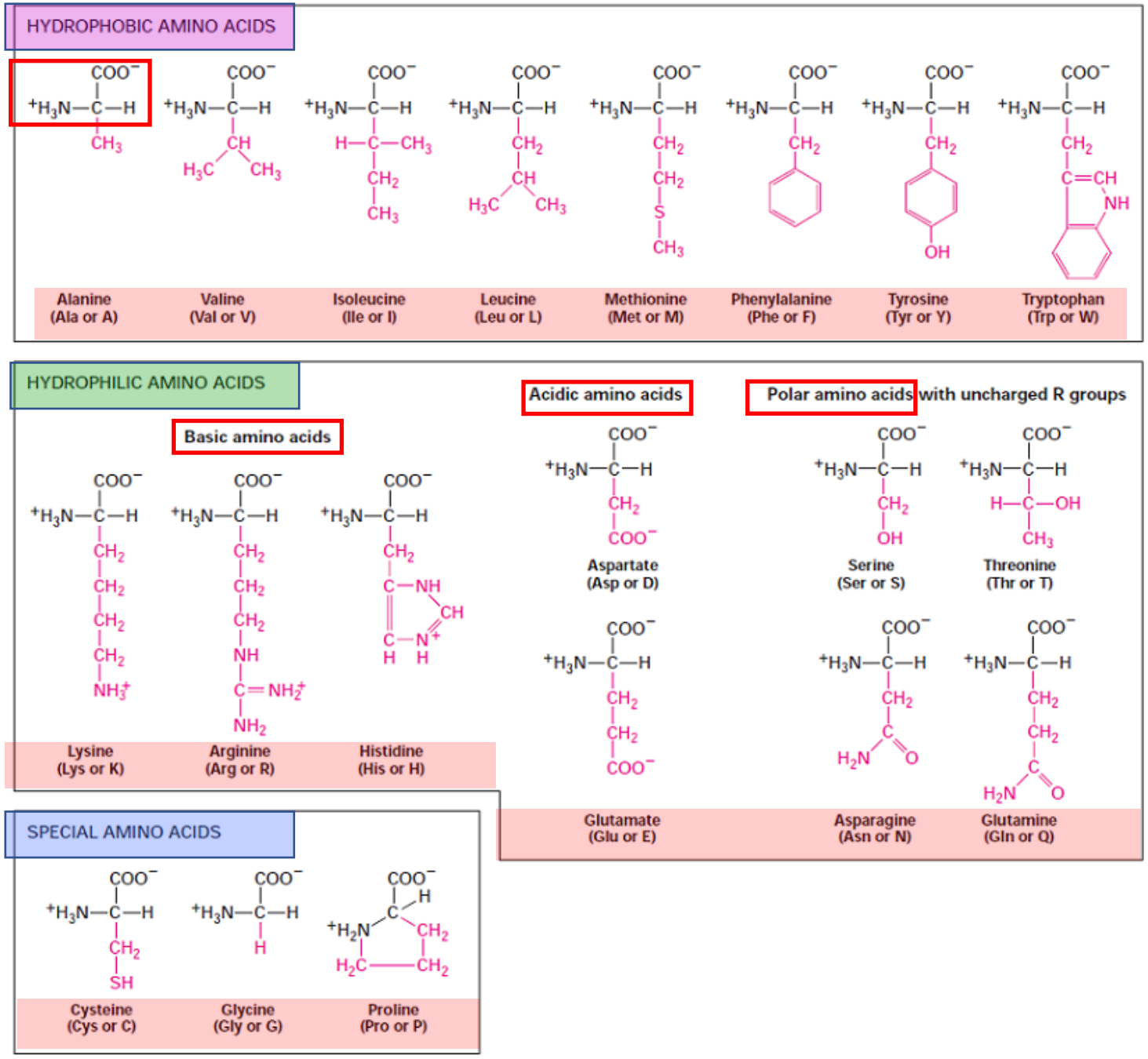
Clinical Neuroscience, by Lisa Weyandt. Second edition. 2019, Taylor & Francis, London.

Recap: Proteins:

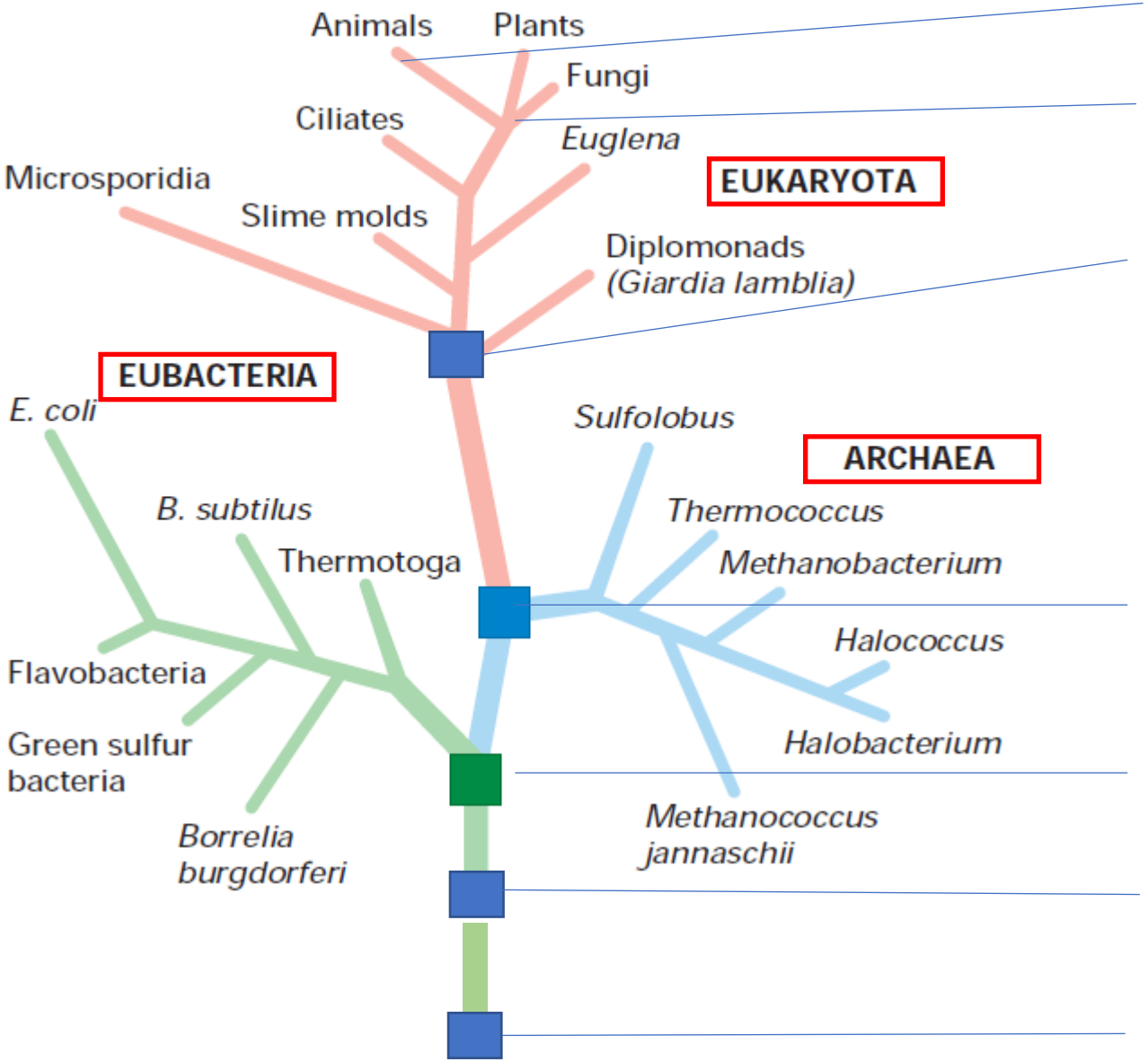
Made from Polymerization of Amino-Acids: Building Block of Life

Plan of any Amino Acid:





Evolution of Life



Man — **3 Lakh Years Ago**

Major Animals — **500 Million Years Ago**

Multicellular Organism — **1 Billion Years ago**

Nucleus — **2 Billion Years ago**

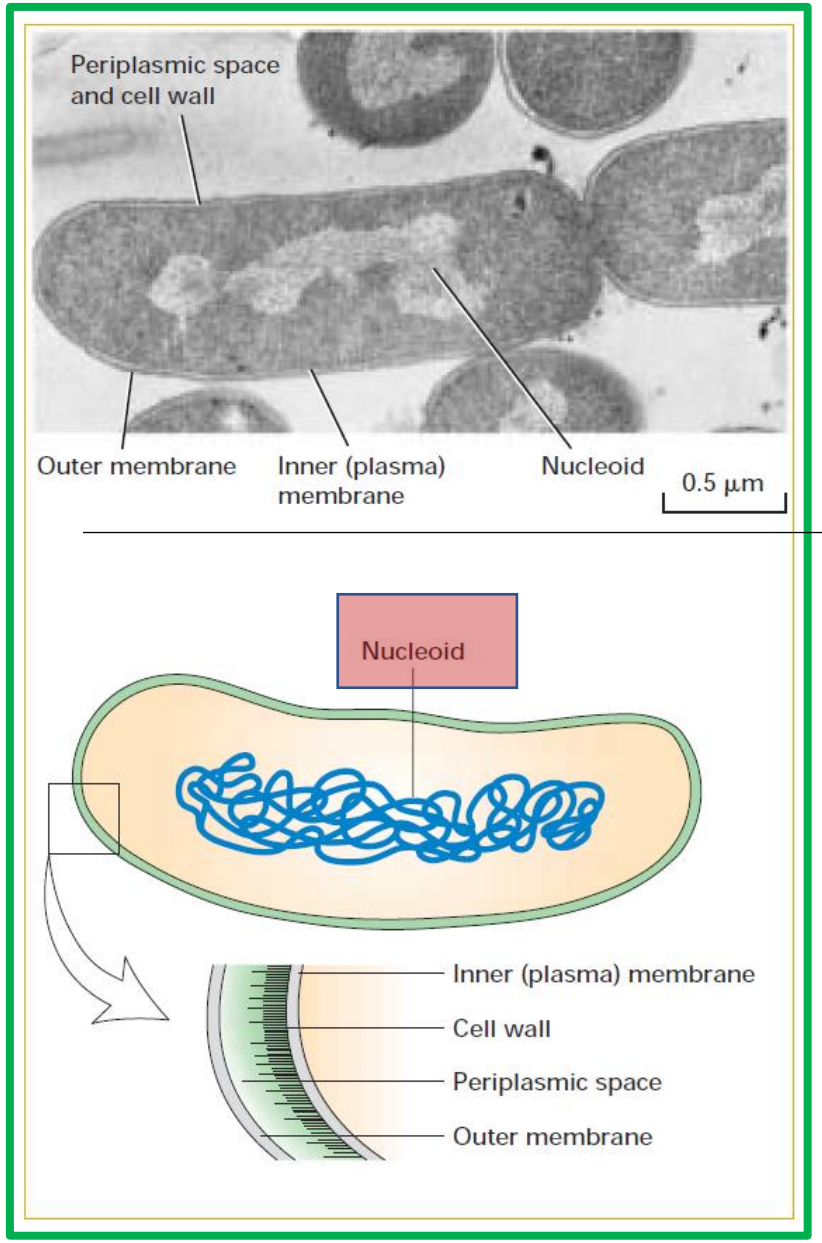
DNA — **3 Billion Years ago**

RNA (e.g. Virus) — **4 Billion Years ago**

Prion-type Replicating molecules — **5 Billion Years ago**

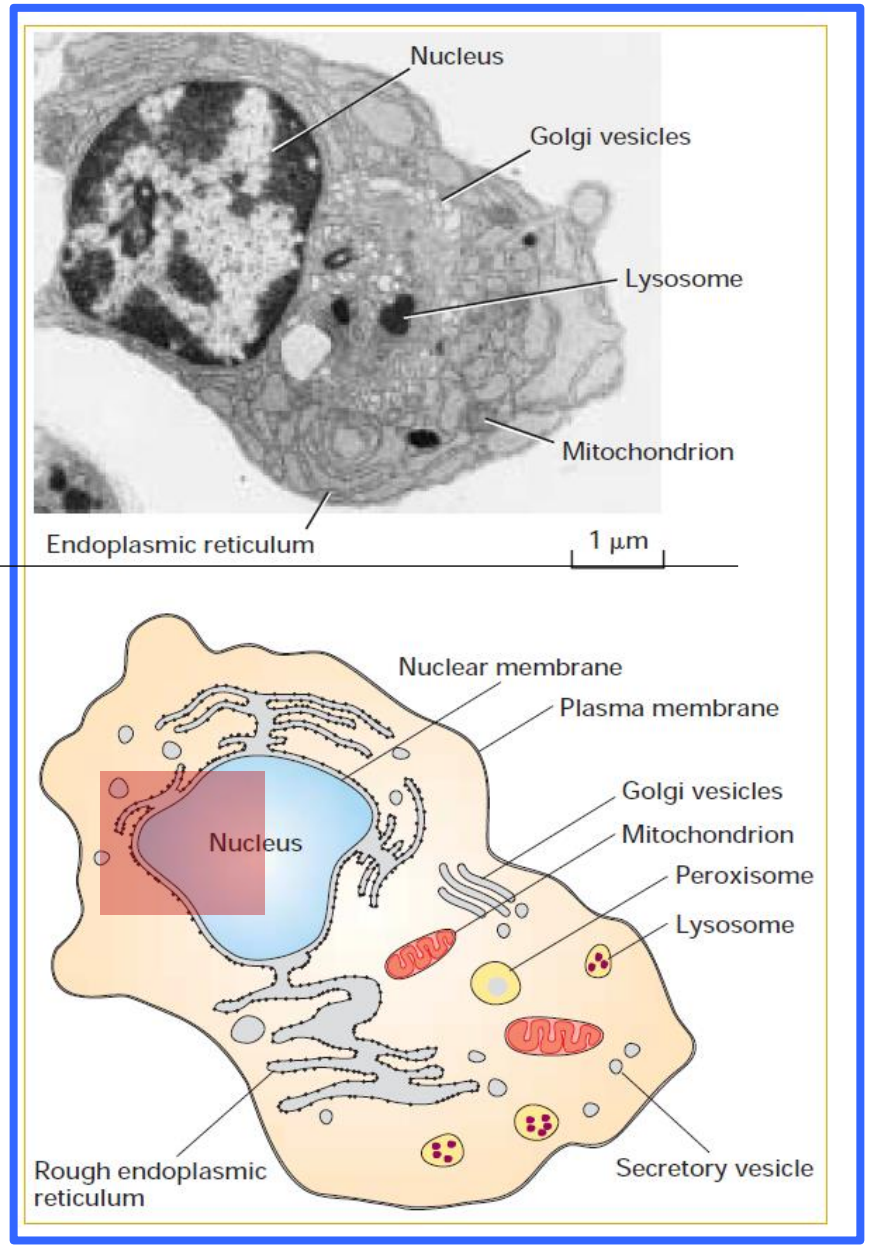
Universe = 10 B.Y.A; Sun = 8 BYA; Earth = 7 BYA; Moon / Tides = 6 BYA

Life Forms: Pro-karyotes (Bacteria) Eu-karyotes (Animals, Plants, Fungi)

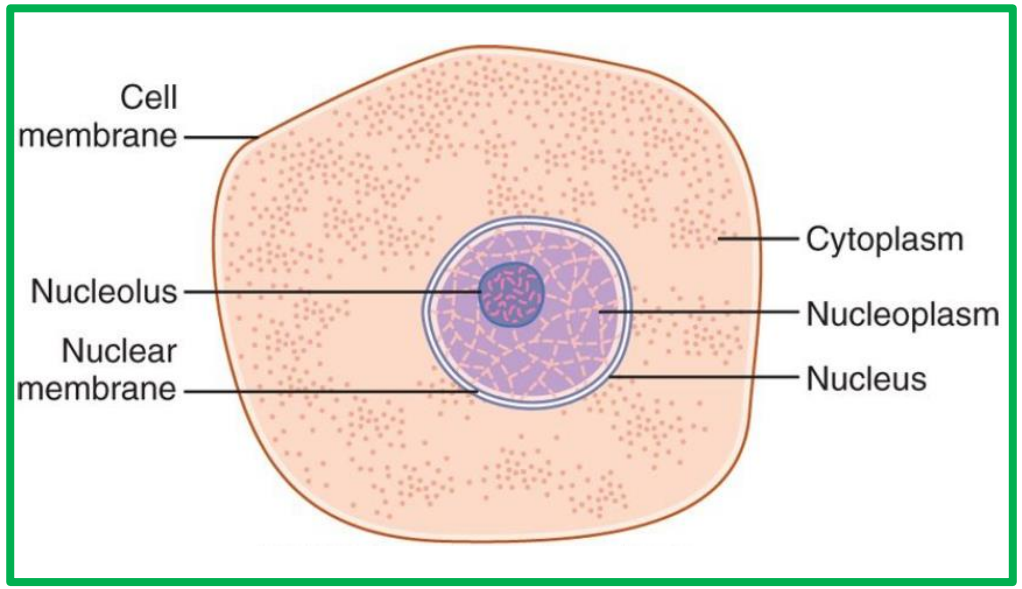


Electron Microscopy

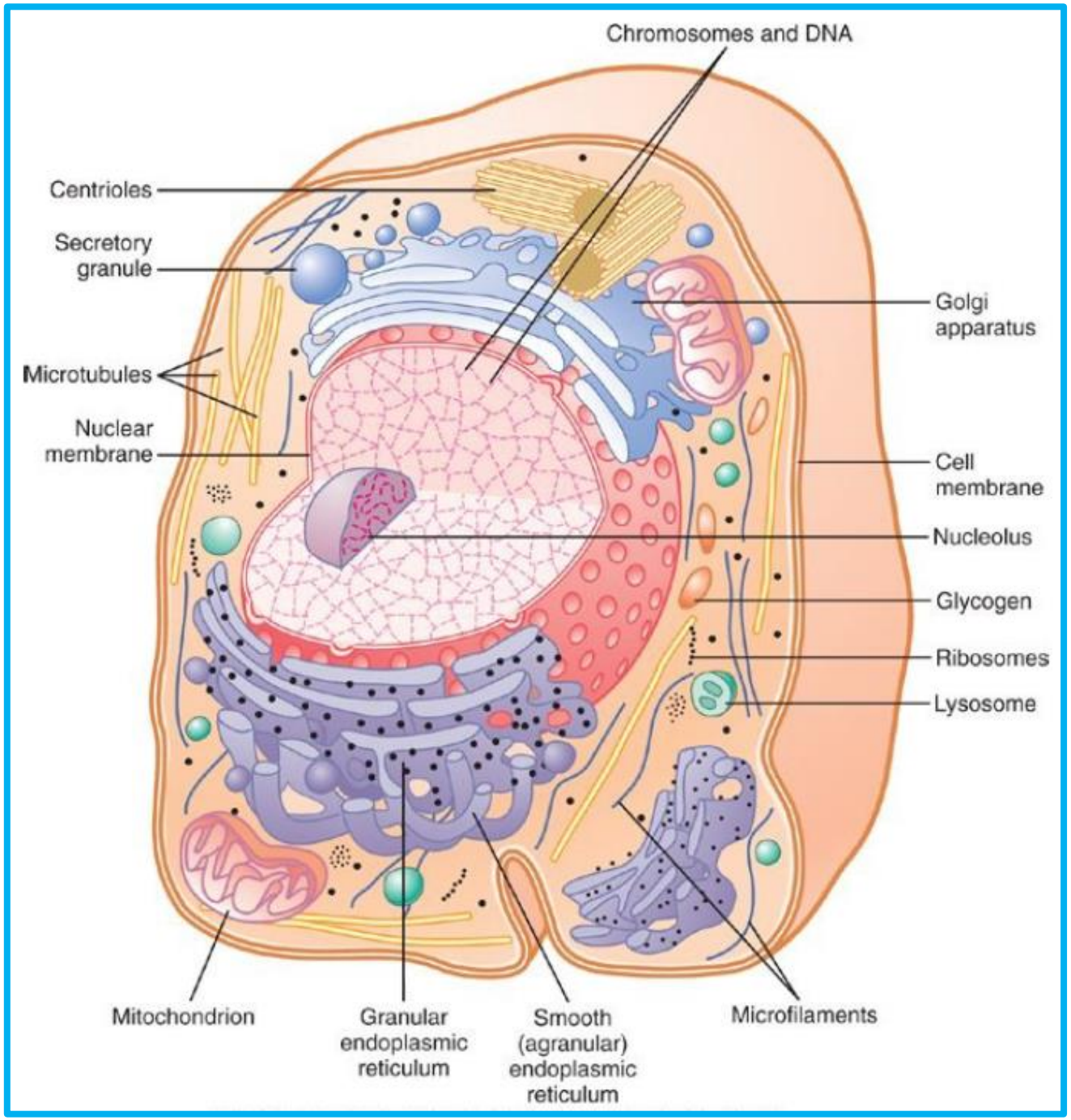
Walls → Cell & Nucleus



The Cell

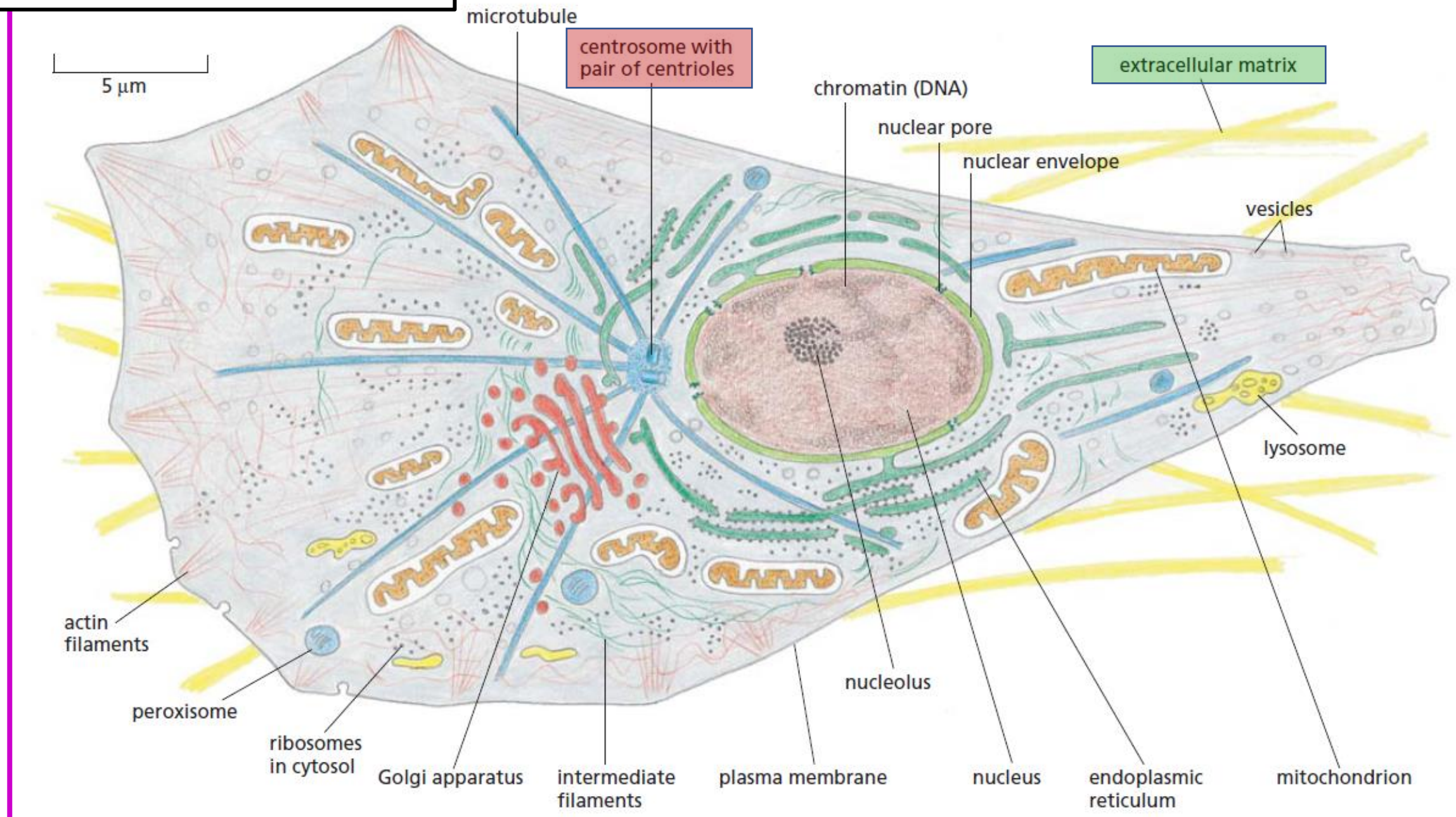


Optical Microscopy



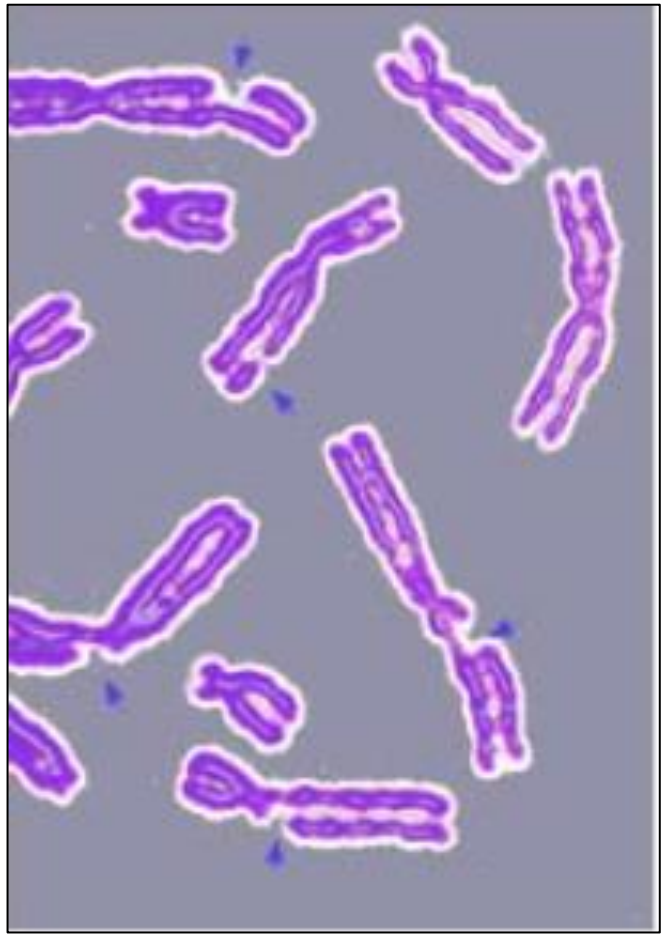
Electron Microscopy

Elongated Cell: Basis of Neuron



Chromosomes in Nucleus:

Human: 23 x 2 = 46

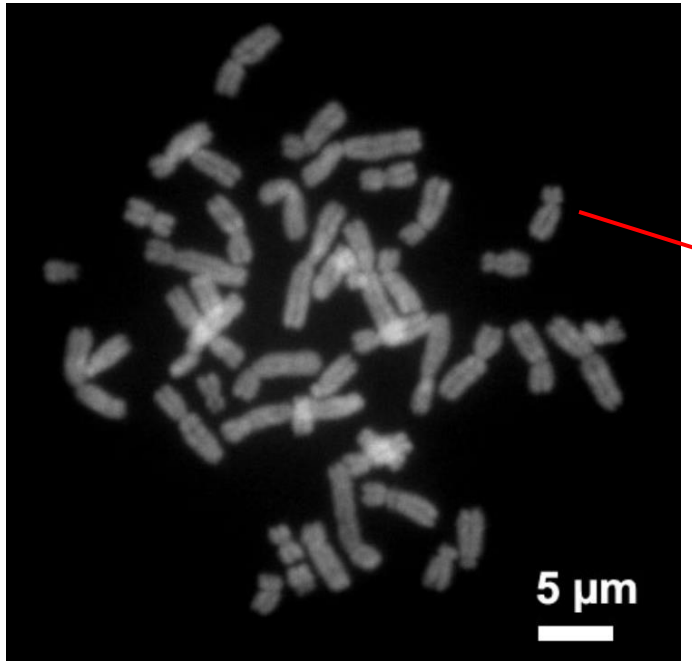


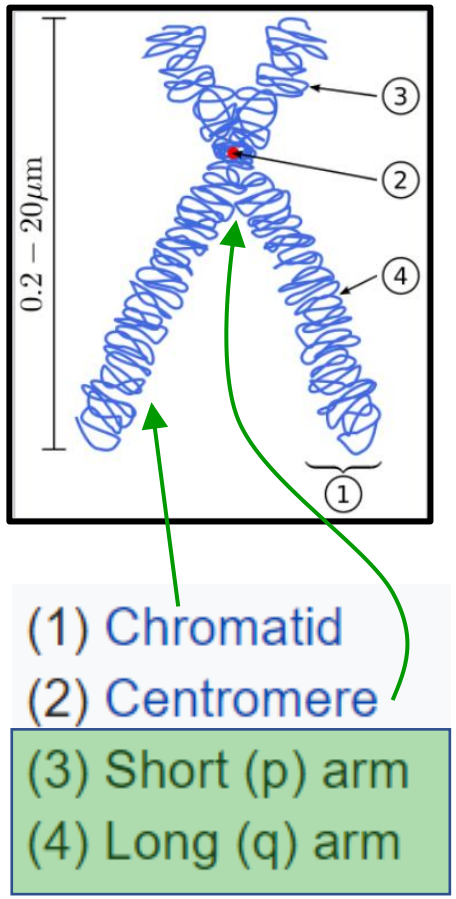
Each chromosome:

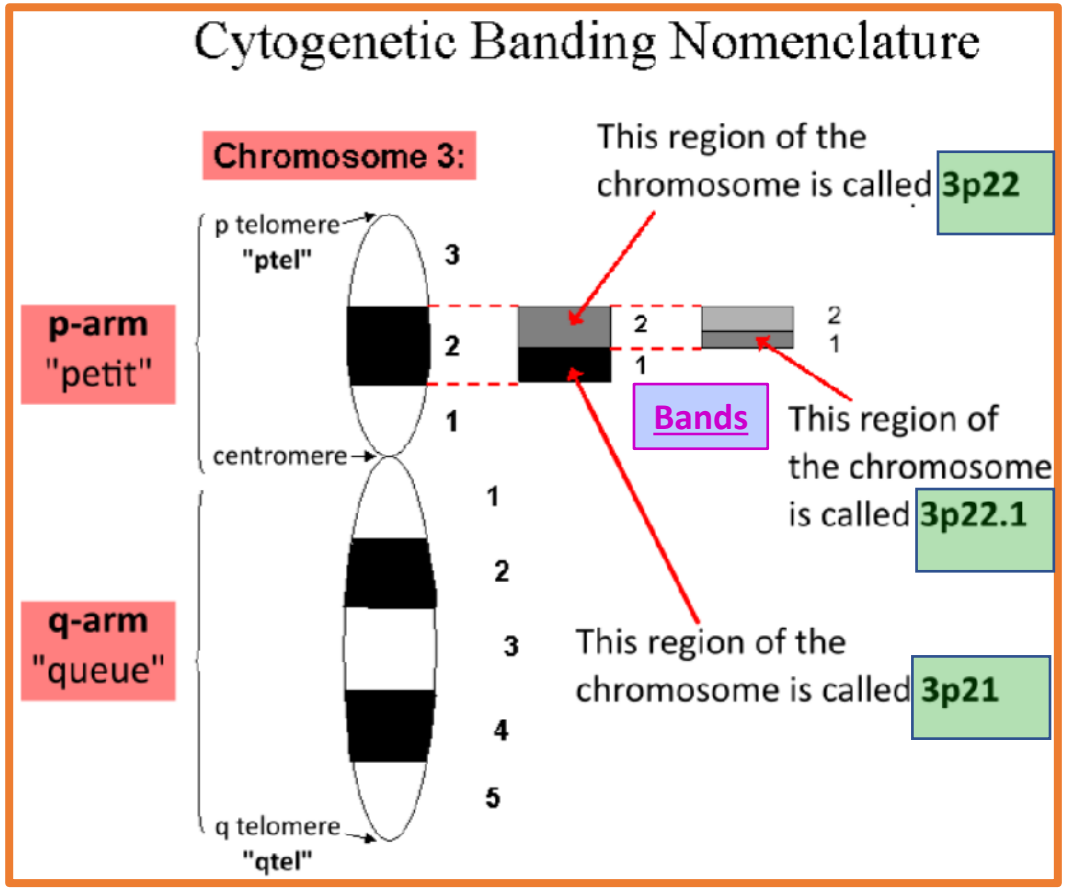
One DNA Molecule of 0.1 - 0.25 Billion Base Pairs

Chromosome Structure & Nomenclature:

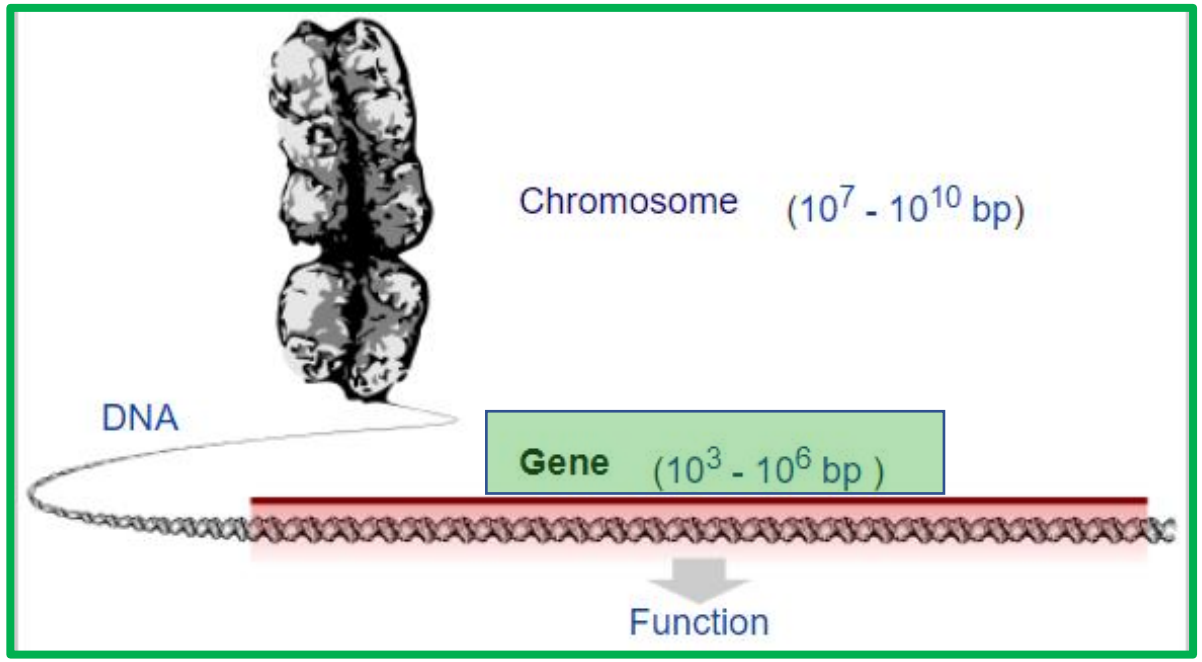
Ranked as per Chromosome Length: 1 ……. 23







Chromosome → Gene → DNA Nucleotide Radicals



A gene is a region of DNA that encodes function. A chromosome consists of a long strand of DNA containing many genes. A human chromosome can have up to 500 million base pairs of DNA with thousands of genes.

DNA Structure