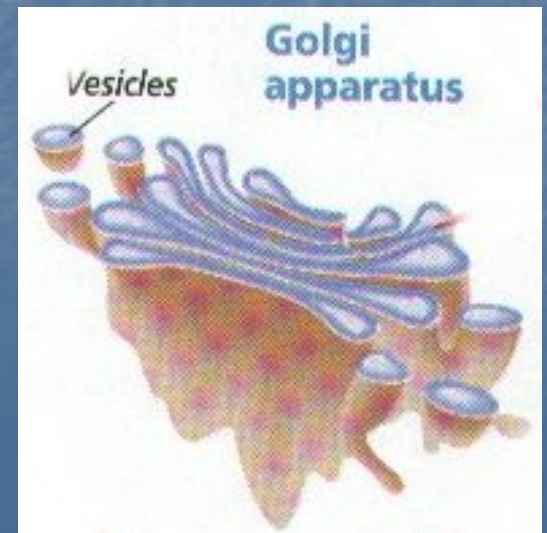
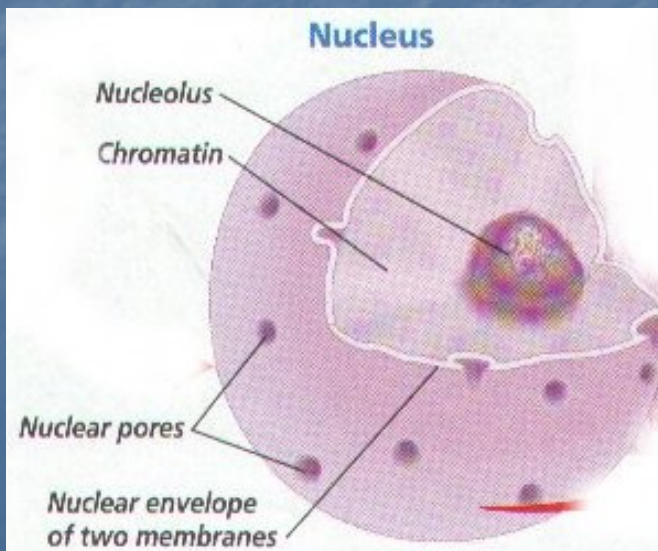
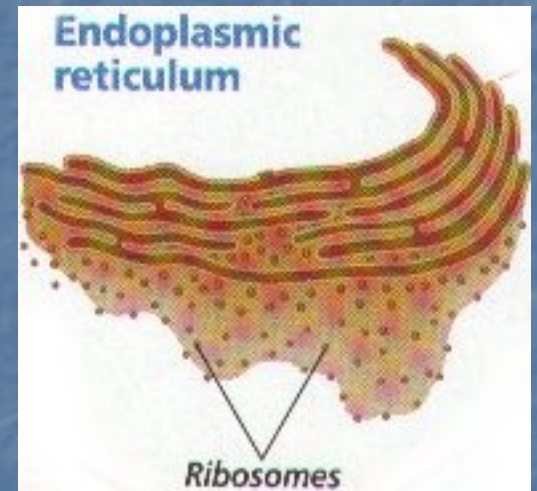
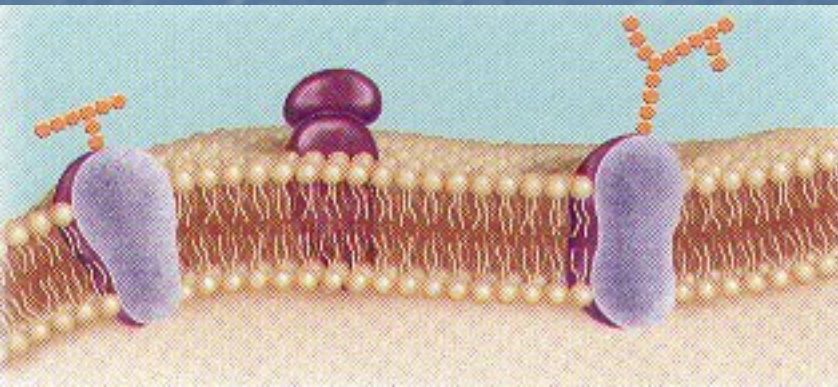
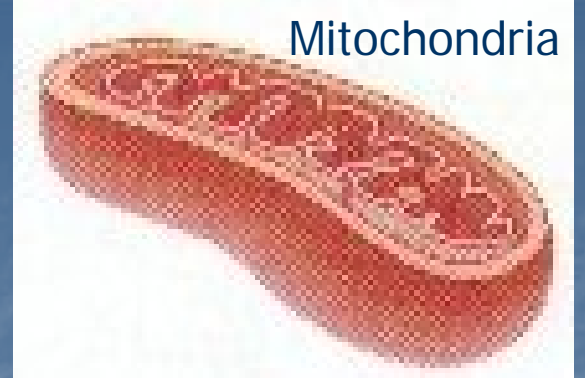
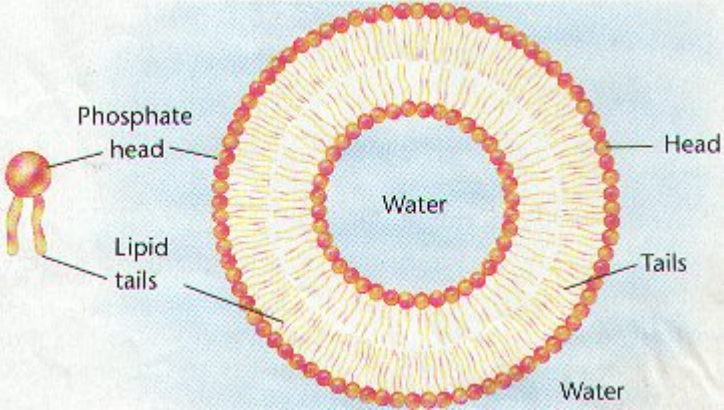


# **Special Topics in Biology**

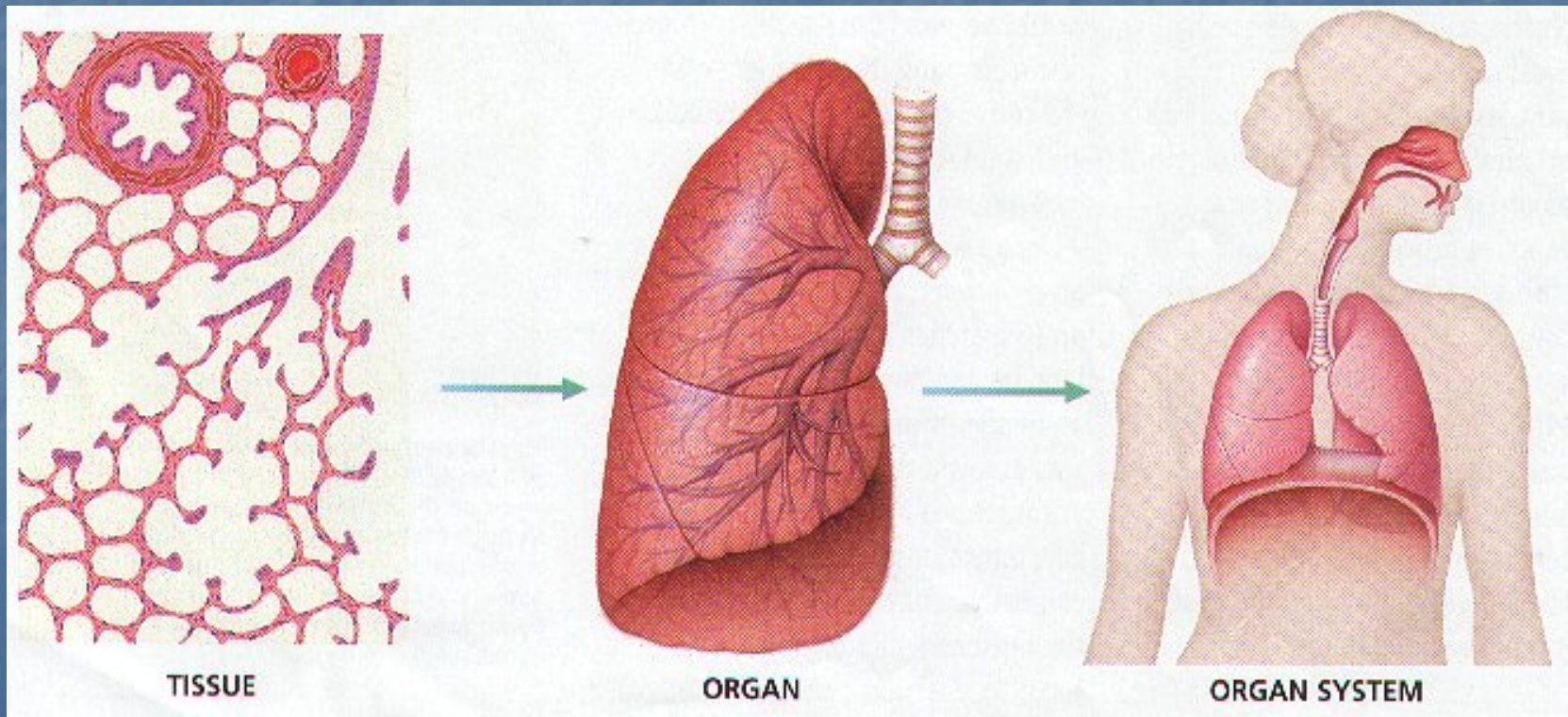
M. Nichole Rylander

# Cell and Tissue Structure

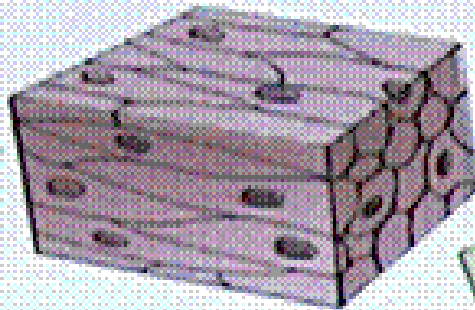


## ■ Multi-cellular Organisms Organization:

- Cellular Level: The smallest unit of life capable of carrying out all the functions of living things.
- Tissue Level: A group of cells that performs a specific function in an organism form the TISSUE.
- Organ Level: Several different types of tissue that function together for a specific purpose form an ORGAN



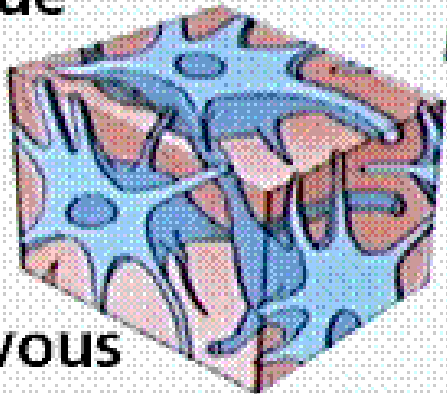
**Smooth muscle tissue**



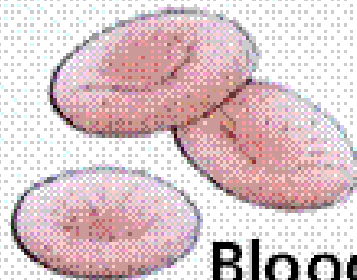
**Stomach**



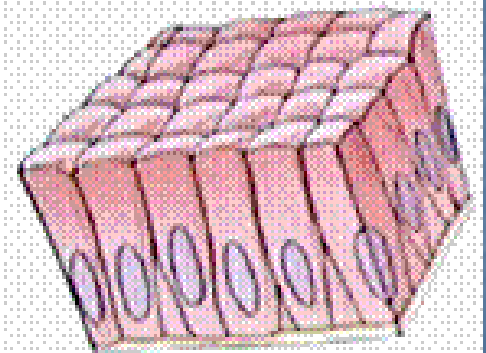
**Loose connective tissue**



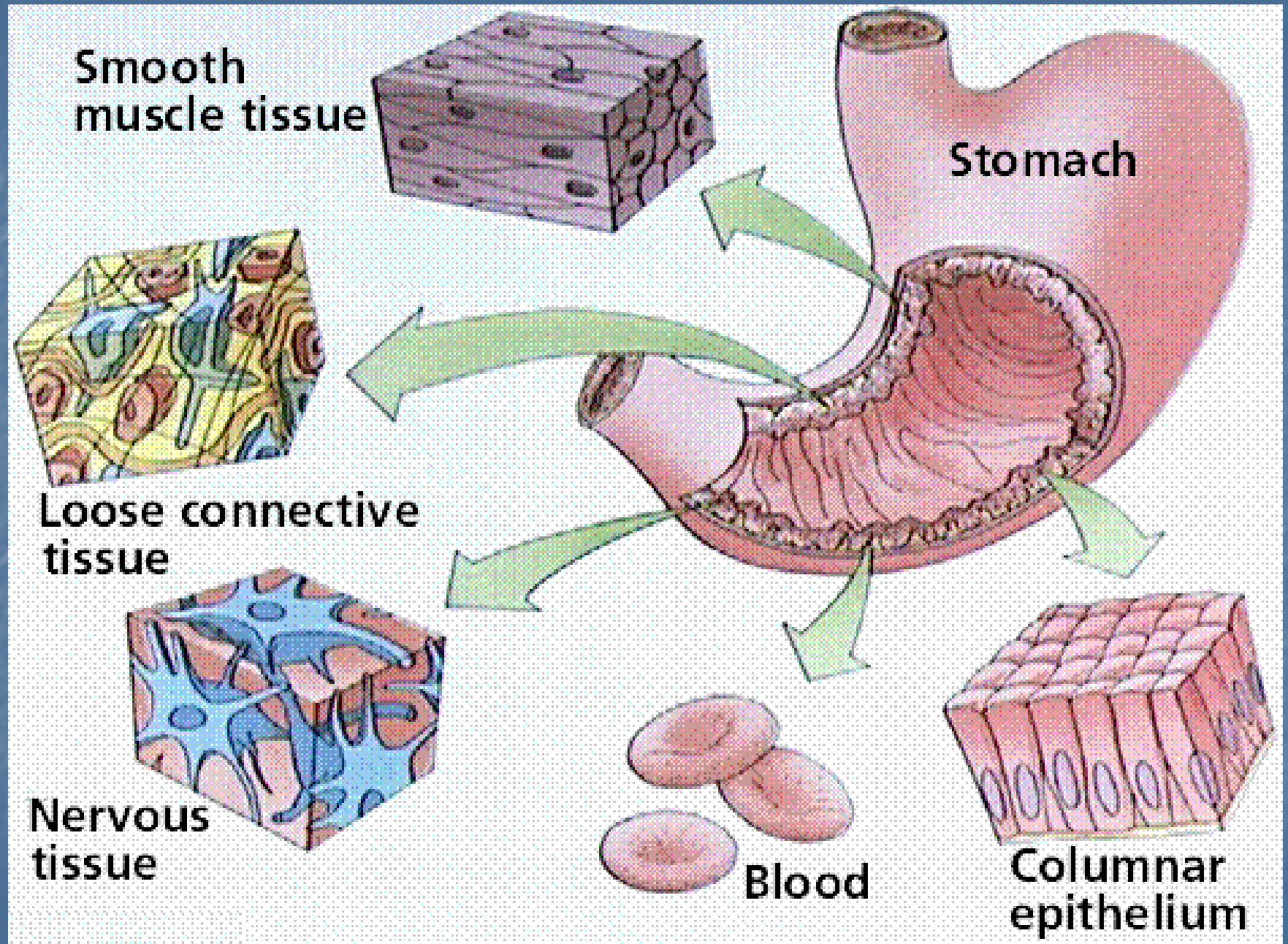
**Nervous tissue**



**Blood**

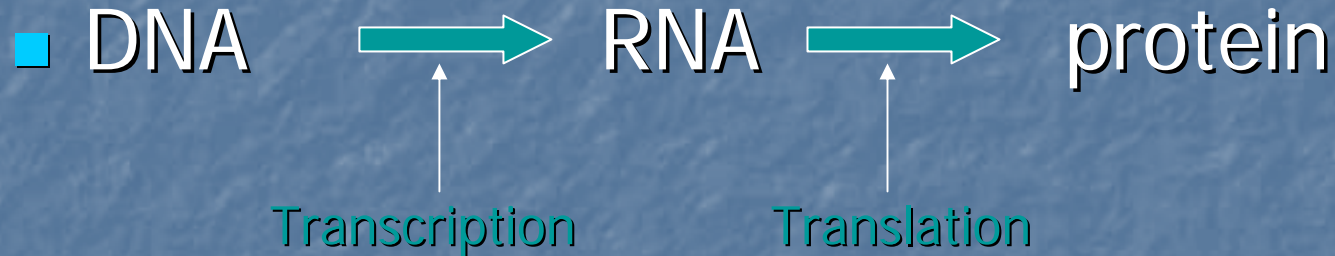


**Columnar epithelium**

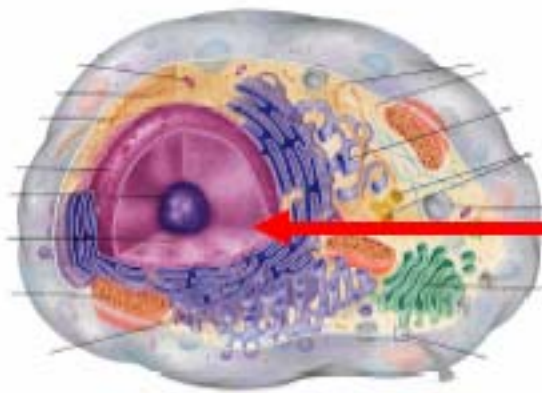


# Transcription and Translation

# The central dogma

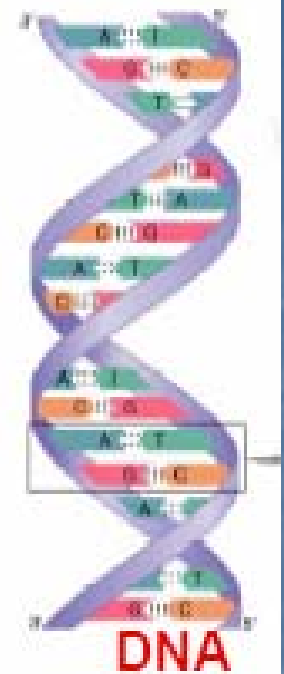


- The expression of genetic information stored in DNA involves, first **transcription** into RNA and then **translation** into the functional protein molecules, in which the **amino acid** sequence is determined by the nucleotide sequence of the DNA.

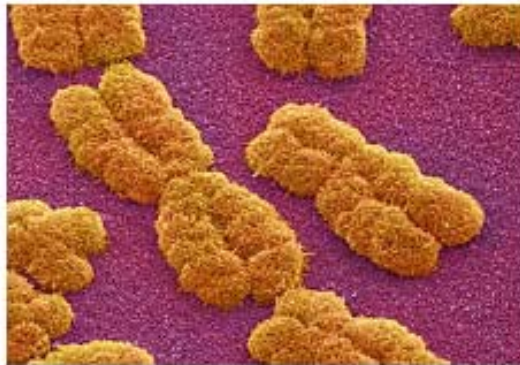


NUCLEUS

- Stores genetic material (genes) in the form of DNA
- Dictates which proteins should be made by cell
- Acts as a central control-point of cell function



## Chromatin



- 46 in human (23 pairs)
- Genes located within chromosomes
- Each gene codes for a particular protein
- 20,000-25,000 genes

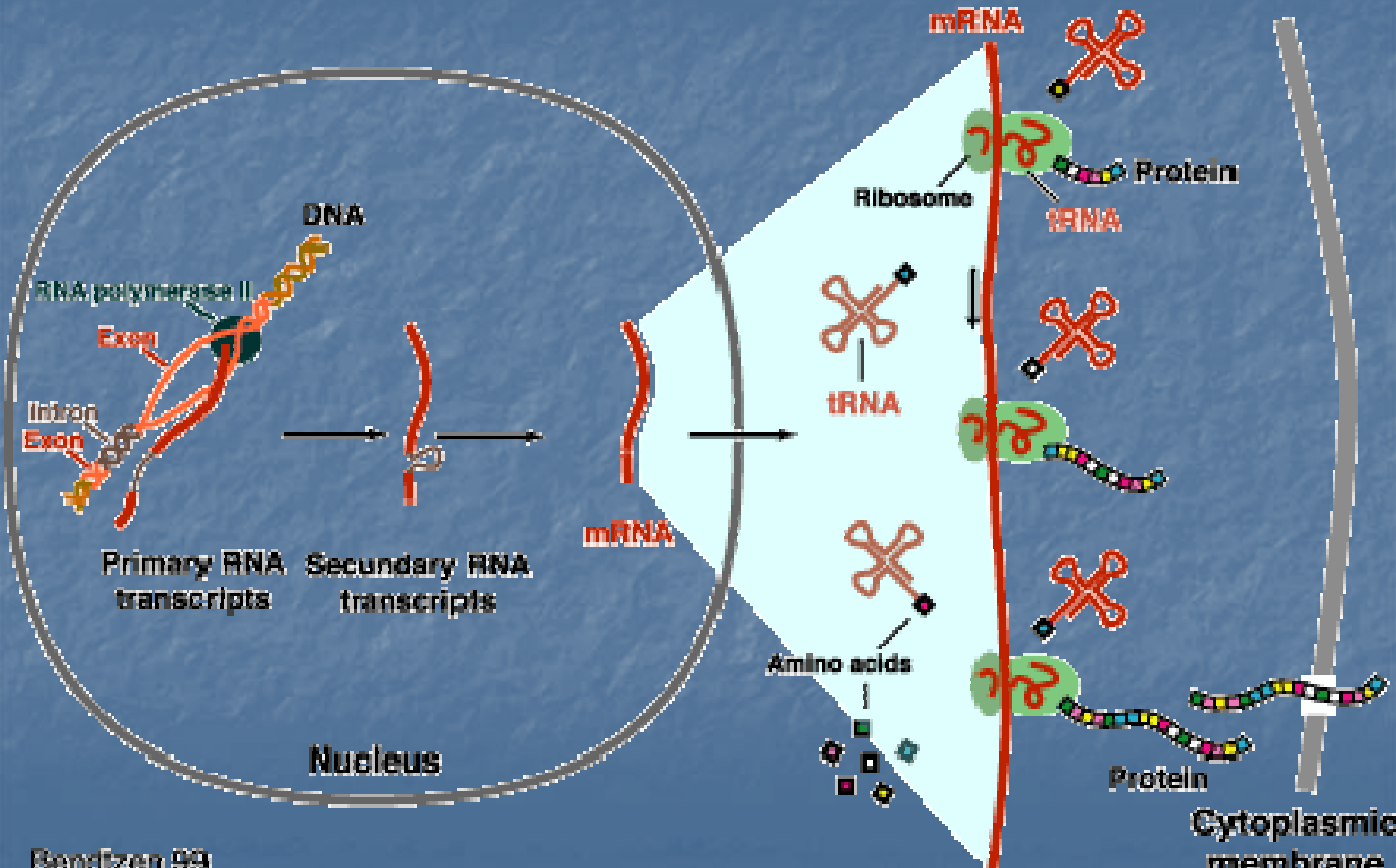


# DNA transcription to RNA

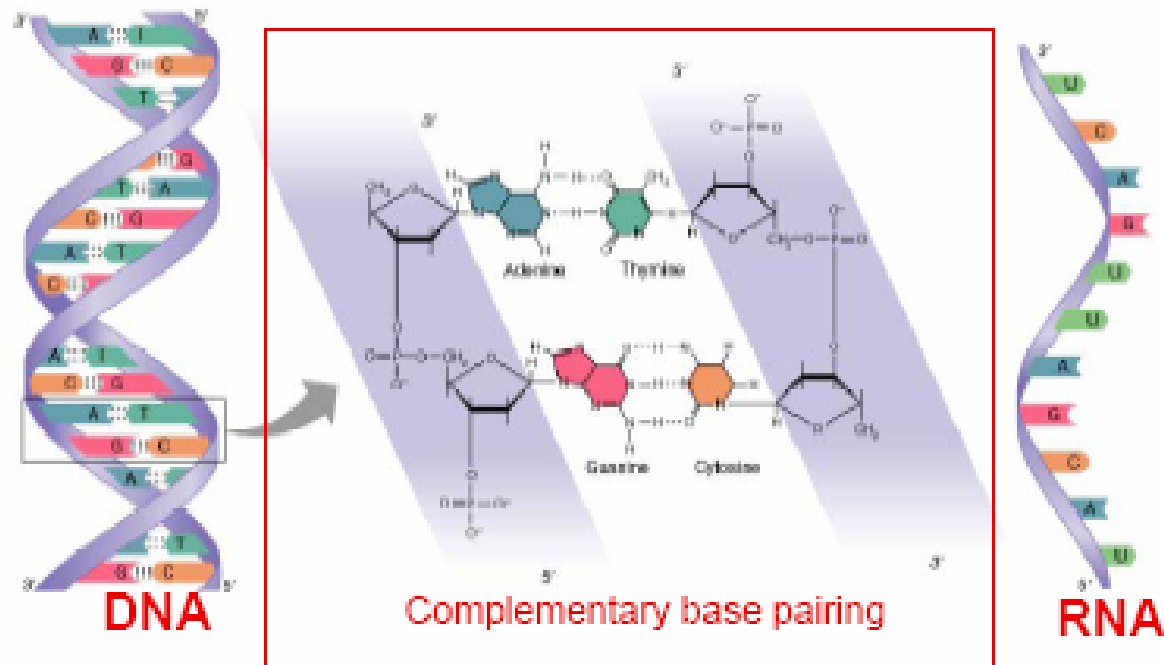
# Transport to cytoplasm

# Translation to protein

# Protein secretion



# Transcription



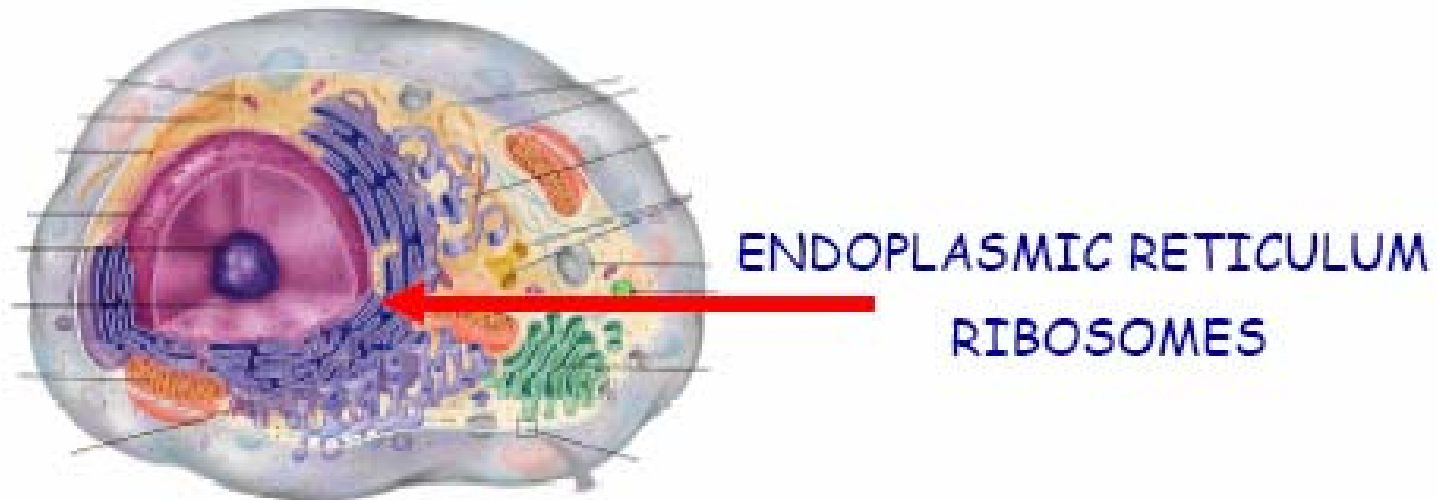
## DNA:

- Sugar backbone: -deoxyribose
- Nucleotide base (Guanine, Cytosine, Thymine, Adenine)

## RNA:

- Sugar backbone: -ribose
- Nucleotide base (Guanine, Cytosine, Uracil, Adenine)

# Translation



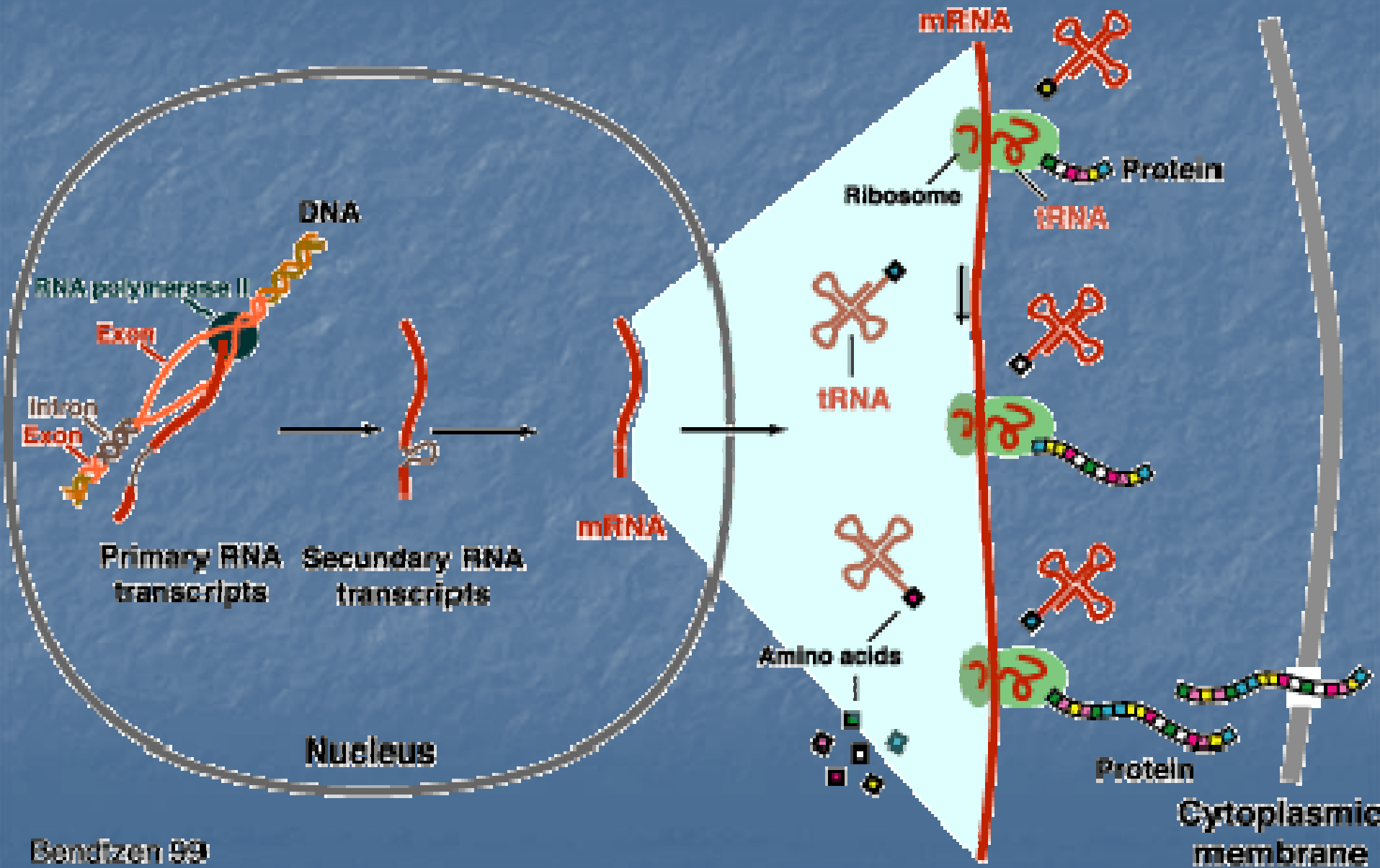
- Receives signal from nucleus to manufacture specific proteins
- Amino acids are "building blocks" for proteins

# DNA transcription to RNA

# Transport to cytoplasm

# Translation to protein

# Protein secretion



# Translation

