

10/2:

Cells and DNA replication:

Protein synthesis:

- **Transcription**

- Occurs inside the nucleus
 - DNA molecule unravels
 - Two polynucleotides stands/chains separate
 - One acts as a template
 - Transcribe the pre messenger RNA (pre-mRNA)
 - One is a coding strand
 - Not used in transcription by **the law of complementarity of bases**
 - The base sequence in the pre mRNA is similar to the base sequence in the coding strand except if the pre-mRNA has uracil, it is replaced by thymine in the coding strand
 - Example:
 - Two DNA polynucleotide strands
 - CCC **template**
 - Coding strand will have GGG **coding strand**
 - You will use the template to make the pre-mRNA
 - **CCC → GGG**
 - After transcription the pre-mRNA will contain
- introns and exons:**

- RNA processes: **s-plicing editing**
 - premRNA minus introns
 - exons form the mRNA
 - exons code for amino acids
 - introns: do not code for amino acids
- 3 base sequence of mRNA → CODON
- 3 base sequence of DNA → TRIPLET
- mRNA moves through the nuclear pore (premRNA cannot go through the nuclear pore because of size exclusion)
 - if you do not get editing and splicing you do not get transcription
- premRNA processes are imperative of translation
- **Translation**
 - Occurs inside the cytoplasm
 - All 3 types of RNA are involved
 - The mRNA → codons, when a codon is covered by a functional ribosome (subunits consists of rRNA)
 - tRNA with complementary bases to the covered codon attaches
 - Ribosome covers the codon (mRNA) GGG
 - Anticodon with complementary bases CCC will bind
 - At the tail of the tRNA is a specific amino acid
 - The primary structure of the protein is synthesized by the formation of peptide bonds between adjacent amino acids
 - Amino acid 1 → amino acid 2 → amino acid 3....
 - Thymine is replaced by Uracil in the anticodon of a triplet

- o Translation brings the message back into its original form

Membranous Epithelial Tissues:

- **Simple Epithelial**

- o **Simple Squamous**

- o **Simple Cuboidal:** lining the tubules in the kidney where reabsorption (absorbing substances filtered back into blood) and secretion occur in the formation of urine

- **Function:** secretion, absorption
 - Germinal Epithelium: outer covering of the ovary composed of simple cuboidal epithelial tissue
 - Composition (tissue type)
 - Location

- o **Simple Columnar:** single layer of tall cells

- **Ciliated Simple Columnar Epithelial Tissue:** contain goblet cells that secrete mucus. Cilia beat to create a unidirectional current that propels mucus, lines the fallopian (uterine) tube, Cilia beat to create a unidirectional current that moves ova (eggs) or zygotes (if the ova are fertilized by sperm)

- **Location:** loose parts of the respiratory system such as the bronchi (tube-like structures that branch from the trachea into the lungs)

- **Function:** secretion of mucus (by the goblet cells) propulsion of mucus by ciliary action

- **Non ciliated Simple Columnar Epithelial Tissue:** cilia are absent, microvilli may be present

- **Location:** lines much of the GI tract, the lining of the small intestine expresses microvilli which increase the surface area of the small intestine for absorption

- **Function:** absorption, secretion (of digestive enzymes)

- o **Pseudostratified Columnar:** a single layer of tall cells of different heights hence, their nuclei also appear at different heights giving the false impression ("pseudo") of stratification, two forms