**Key Words:**

✓ **Single Stranded RNA Virus**
  
  * A virus that has single stranded RNA as its genetic material. The single stranded can be split into two groups according to their polarity: positive sense and negative sense. Positive sense is similar to mRNA, and therefore can be translated by the host cell causing an infection. Negative sense has to be transcribed into the positive sense before it can be translated, therefore negative sense is not initially infectious.

✓ **Double Stranded RNA Virus**
  
  * A virus that has both the positive sense viral RNA and the negative sense RNA as its genetic material. Because it always has the positive sense viral RNA, the double strand can be translated by the host cell and cause an infection. The DS RNA virus have a wide variety of hosts, i.e. animals, plants, and bacteria.

✓ **RNA Retrovirus**
  
  * A virus that puts a copy of its RNA into the DNA of a host cell. The virus produces DNA from its RNA genome in the reverse order. The new DNA is incorporated in the host cell, so the host cell treats the viral DNA as part of its own genome. So the host cell starts producing the right proteins required to make new copies of the virus.

✓ **Frame shift mutation**
  
  * A genetic mutation caused by the insertion or deletion of nucleotides in the DNA sequence. Because the gene expression is read in triplets, the insertion or deletion changes the reading frame, resulting in a completely different translation than the original. The earlier on in the sequence the insertion or deletion occurs, the bigger the change in the protein.

✓ **S Protein (Spike Protein)**
  
  * Spike Protein. A vitamin K-dependent plasma glycoprotein synthesized in the liver that is used in the anti-coagulation pathway.

✓ **M Protein**
  
  * A protein that covers some viruses, parasites, and bacteria. That helps them gain entry into a host cell by counteracting the host's defenses. Produced by certain species of Streptococcus.

✓ **E Protein (Envelope Protein)**
  
  * A small, integral membrane protein involved in several aspects of the virus' life cycle, such as assembly, budding, envelope formation, and Pathogenesis.

✓ **N Protein (Nucleocapsid Protein)**
  
  * Most abundant protein in coronavirus. Used as a marker in diagnostic assays. The abundance and high hydrophilicity of N protein are supposed to contribute to immunity after coronavirus infection.

✓ **ACE-receptor (Angiotensin-converting Enzyme)**
  
  * An enzyme on the outside of a cell that generate small proteins that regulate cell function. The protein provide the entry point for the coronavirus to hook into and infect the host cells. Found in many cell types, i.e. heart, lung, blood vessels, kidneys, etc.

✓ **SARS (Severe Acute Respiratory Syndrome)**
  
  * An airborne virus and can spread through small droplets of saliva. Incubation period = 2-7 days (sometimes up to 10)

✓ **SARS-CoV (Severe Acute Respiratory Syndrome Coronavirus)**
  
  * A strain of Coronavirus that causes SARS. An enveloped, positive-sense, single stranded RNA virus which infects the lungs. Binds to ACE2-receptor

✓ **SARS-CoV2**
  
  * A positive-sense single stranded RNA virus that is contagious in humans. Caused COVID-19. Successor to SARS-CoV.
Koch's Postulate
- Four criteria designed to establish a causative relationship between a microbe and a disease. Used to confirm that SARS-CoV-1 was the causing agent of the SARS outbreak in 2003
  1. The microorganism must be found in abundance in all organisms suffering from the disease, but should not be found in healthy organisms
  2. The microorganism must be isolated from a diseased animal and grown in pure culture
  3. The cultured microorganism should cause disease when introduced into a healthy organism
  4. The microorganism must be reisolated from the inoculated, diseased experimental host and identified as being identical to the original specific causative agent

Alpha and Beta Coronavirus
- Positive sense, single-stranded RNA viruses that have spherical virions with club-shaped spike proteins, with lineages that descend from the bat viral gene pool. Two of the four genera of coronaviruses

Coronaviruses
- A group of related RNA viruses that range from mild illnesses (e.g., common cold) to lethal illnesses (e.g., SARS, MERS, Covid-19). Causes respiratory tract infections in humans

COVID-19
- A contagious disease caused by SARS-CoV-2, led to a global pandemic

MERS-CoV (Middle East Respiratory Syndrome-related Coronavirus)
- A species of Coronavirus, a member of the Betacoronavirus, a positive-sense, single-stranded RNA virus that binds to the DPP4 receptor

Receptor-Binding Domain (RBD)
- A key part of a virus located on its 'spike' domain that allows it to dock to body receptors to gain entry into host cells and leads to infection

Epithelial Cells
- Cells that come from the surface of your body, e.g., skin, blood vessels, etc., that serve as a barrier between the outside and inside of the body to protect from viruses

Cytokines
- A broad and loose category of small proteins important in cell signaling, they are especially important in the immune system, crucial for fighting off infections

Glycoprotein
- Any class of proteins that have carbohydrate groups attached to a polypeptide chain

Chloroquine/hydroxychloroquine
- FDA-approved to treat or prevent malaria/autoimmune conditions. FDA cautions against using these outside of the hospital setting or clinical trial due to risk of heart rhythm problems

Ritonavir
- Antiretroviral medication

Real Time PCR (Real Time Polymerase chain reaction)
- A technique of collecting data throughout the PCR process as it occurs, used to measure gene expression

Therapeutic
- Relating to the healing of disease

Diagnostic
- Concerned with the diagnosis of illness or other problems

Vaccine
- A substance used to stimulate the production of antibodies and provide immunity against one or several diseases, prepared from the causative agent of a disease, its products, or a synthetic substitute, treated to act as an antigen without inducing the disease
✓ Remdesivir
  * Broad-spectrum antiviral medication

✓ Neutralizing Antibodies
  * An antibody that is responsible for defending the cell against pathogens, which are organisms that cause diseases

✓ COVID-19 Recent Mutations
  * A mutation in the spike RBD allows the virus to escape recognition by some neutralizing antibodies
  * A mutation in which at the 614th amino-acid position of the spike protein, the aspartate (D) was being replaced by the glycine (G), which resulted in a more transmittable form of SARS-CoV-2