1. What is RNA?
2. RNA or Ribonucleic acid is a molecule that present in many living organisms. It is made up of nucleotides, which are ribose sugars attached to nitrogenous bases and Phosphates. RNA mostly exists in the form of single stranded form.

Transcription - The process of RNA formation from DNA.

Translation – The process of Protein synthesis from RNA.

The Main types of RNA involved in protein synthesis are messenger RNA(m-RNA), transfer RNA(t-RNA) and ribosomal RNA(r-RNA).

m-RNA – It has an ability to modify the cells. Hence researchers are studying m-RNA as anti-cancer treatment.

t-RNA – These are RNA molecules which translates m-RNA molecules into protein.

Functions of RNA

* The primary function of RNA is to create proteins through translation.
* RNA carries genetic information that is translated by ribosomes into various proteins.
* RNA serves primary genetic material for viruses.
* RNA editing, gene regulation and RNA interference are other functions of RNA.

1. What are the major differences between DNA and RNA?

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| **Comparison** | DNA | RNA |
| **Full Name** | Deoxyribonucleic Acid | Ribonucleic Acid |
| **Function** | DNA replicates and stores genetic information. It is a blueprint for all genetic information contained within an organism. | RNA converts the genetic information contained within DNA to a format used to build proteins, and then moves it to ribosomal protein factories. |
| **Structure** | DNA consists of two strands, arranged in a double helix. These strands are made up of subunits called nucleotides. Each nucleotide contains a phosphate, a 5-carbon sugar molecule and a nitrogenous base. | RNA only has one strand, but like DNA, is made up of nucleotides. RNA strands are shorter than DNA strands. RNA sometimes forms a secondary double helix structure, but only intermittently. |
| **Length** | DNA is a much longer polymer than RNA. A chromosome, for example, is a single, long DNA molecule, which would be several centimetres in length when unravelled. | RNA molecules are variable in length, but much shorter than long DNA polymers. A large RNA molecule might only be a few thousand base pairs long. |
| **Sugar** | The sugar in DNA is deoxyribose, which contains one less hydroxyl group than RNA’s ribose. | RNA contains ribose sugar molecules, without the hydroxyl modifications of deoxyribose. |
| **Bases** | The bases in DNA are Adenine (‘A’), Thymine (‘T’), Guanine (‘G’) and Cytosine (‘C’). | RNA shares Adenine (‘A’), Guanine (‘G’) and Cytosine (‘C’) with DNA, but contains Uracil (‘U’) rather than Thymine. |
| **Base Pairs** | Adenine and Thymine pair (A-T)  Cytosine and Guanine pair (C-G) | Adenine and Uracil pair (A-U)  Cytosine and Guanine pair (C-G) |
| **Location** | DNA is found in the nucleus, with a small amount of DNA also present in mitochondria. | RNA forms in the nucleolus, and then moves to specialised regions of the cytoplasm depending on the type of RNA formed. |
| **Reactivity** | Due to its deoxyribose sugar, which contains one less oxygen-containing hydroxyl group, DNA is a more stable molecule than RNA, which is useful for a molecule which has the task of keeping genetic information safe. | RNA, containing a ribose sugar, is more reactive than DNA and is not stable in alkaline conditions. RNA’s larger helical grooves mean it is more easily subject to attack by enzymes. |
| **Ultraviolet (UV) Sensitivity** | DNA is vulnerable to damage by ultraviolet light. | RNA is more resistant to damage from UV light than DNA. |