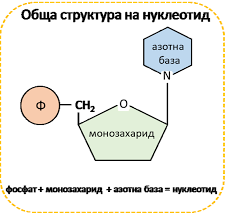
Nucleic acids

DNA and RNA are polymers and are made up of monomers known as nucleotides. When these monomers combine, the resulting chain is called a polynucleotide.

Each nucleotide in DNA contains one of four possible nitrogenous bases: adenine (A), guanine (G) cytosine (C), and thymine (T). RNA nucleotides may also bear adenine, guanine, and cytosine bases, but instead of thymine they have another base called uracil (U).



**Polynucleotide chains**

A consequence of the structure of nucleotides is that a polynucleotide chain has directionality – that is, it has two ends that are different from each other. At the 5’ end, or beginning, of the chain, the 5’ phosphate group of the first nucleotide in the chain sticks out. At the other end, called the 3’ end, the 3’ hydroxyl of the last nucleotide added to the chain is exposed. DNA sequences are usually written in the 5' to 3' direction, meaning that the nucleotide at the 5' end comes first and the nucleotide at the 3' end comes last.

As new nucleotides are added to a strand of DNA or RNA, the strand grows at its 3’ end, with the 5′ phosphate of an incoming nucleotide attaching to the hydroxyl group at the 3’ end of the chain.

**Types of RNA**

Messenger RNA (mRNA) – around 2% of RNA. mRNA makes a copy, or transcript, of the gene’s DNA sequence. The transcript carries the same information as the DNA sequence of its gene. It is used as a matrix in protein synthesis.

Ribosomal RNA (rRNA) – around 83% of RNA. rRNAis a major component of ribosomes, where it helps mRNA bind in the right spot so its sequence information can be read out.

transfer RNA (tRNA) – around 15% of RNA. tRNA transports amino acids to the robosomes, so they’re placed in the right places of the polypeptide chain.

