# Proteins

* Enzymes are proteins (end with -ase)
* Proteins are made by amino acids
* Proteins are not built directly from DNA. A molecule of RNA contains the instructions to synthesize proteins.

# Ribonucleic acid

* A nucleic acid (RNA)
* The sugar is Ribose
* Single stranded, and smaller than DNA to leave through the nuclear pores.
* Different nitrogenous bases
  + Adenine
  + Uracil (instead of thymine)
  + Cytosine
  + Guanine
* Used by ribosomes to synthesize proteins.

# Central Dogma of DNA

1. Replication
   1. DNA synthesis
   2. Happens in the S phase of the cell cycle
   3. Enzyme responsible: DNA polymerase
2. Transcription
   1. RNA synthesis
   2. Need a middleman (RNA) because DNA cannot leave the nucleus and get to the ribosomes.
   3. The cell uses RNA to send DNA’s message from the nucleus to the ribosomes in the cytoplasm or on the rough ER.
   4. Enzyme responsible: RNA polymerase
3. Translation
   1. Protein synthesis.
   2. Happens inside the ribosome.
   3. Ribosomes translate the bases into the correct order of amino acids to assemble the proteins by the cell.

# RNA

* Messenger RNA
  + The way RNA polymerase reads the RNA strand is in 3 letter intervals
  + Sequences of three base sequences are known as codons
  + Makes up codons, which correspond to a specific amino acid
* Transfer RNA
  + Transfers amino acids to the RNA
  + After bringing the amino acids, tRNA is a molecule that assembles the proteins.
  + tRNA has an anticodon, verifies it by successfully bonding to the mRNA and then dropping off the protein into the polypeptide chain.
* Ribosomal RNA
  + Makes up ribosomes