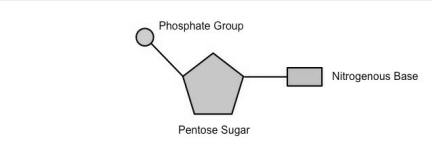
Genetic Information Must-Knows

All living organisms on Earth's genetic information is either in the form of **DNA** or **RNA**.

Genetic information is passed on *from one generation to the next*.

With rare exceptions, prokaryotes have circular genetic information and eukaryotes have linear genetic information.

What makes up Genetic Information?



Both DNA and RNA have sugar-phosphate backbones that make up the "strands" shape. In DNA, the bases that pair with one another make the ladder shape in the middle.

History of Our Knowledge of Genetics

Avery, Macleod, and McCarty	They performed experiments and found that DNase (deoxyribonucle*ase*) prevented a change in a strain of bacteria. Therefore, DNA is the transforming principle aka genetic material.
Hershey and Chase	Viruses made of DNA and marked protein coats were introduced to bacteria. The bacteria was infected by the virus; however, the protein stayed on the surface of the bacteria while the DNA was injected and all new viruses on the inside of the bacteria were not marked.

History of Our Knowledge of Genetics (cont)

Watson and Crick	Watson and Crick used information from Franklin and Wilkins's research and figured out that DNA has a **double-helix** structure.

The Different Bases

Purines	Guanine and Adenine have double ring structures.
Pyrimidines	Cytosine, Thymine, and Uracil have single string structures.

Opposites attract! **G** pairs with **C** and **A** pairs with **T**. (In RNA, **A** pairs with **U**.)

DNA and RNA Differences

	DNA	**RNA**
Sugar	Deoxyribose	Ribose
Bases	Adenine	Adenine
	Guanine	Guanine
	Cytosine	Cytosine
	Thymine	*Uracil*
Strands	Double-Stranded	Single Stranded

Types of RNA and Their Functions

mRNA	**tRNA**	**rRNA**
messenger	transfer	ribosomal
genetic info from nucleus to ribosome	transfers amino acid to a protein	makes up most of ribosome
3 bases makes a codon that codes for an amino acid	3 bases complimentary to an mRNA make up an anticodon that binds to the codon	functional building block of ribosome

How does DNA tell my cells what to do?

Transcription- RNA is made from the DNA and is made from complimentary bases. (EX: GCAATT on the DNA strand will create CGUUAA on the RNA made from it.)

Translation- RNA is used to create proteins in the ribosome. Each 3 pairs of RNA creates a codon which creates an amino acid. (EX: CGU makes Arginine and UAA stops the coding.)

The amino acids make up proteins which create our physical features. The stop codon stops the coding and breaks off the chain of amino acids from the ribosome. That chain is now a (hopefully) functional protein.

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