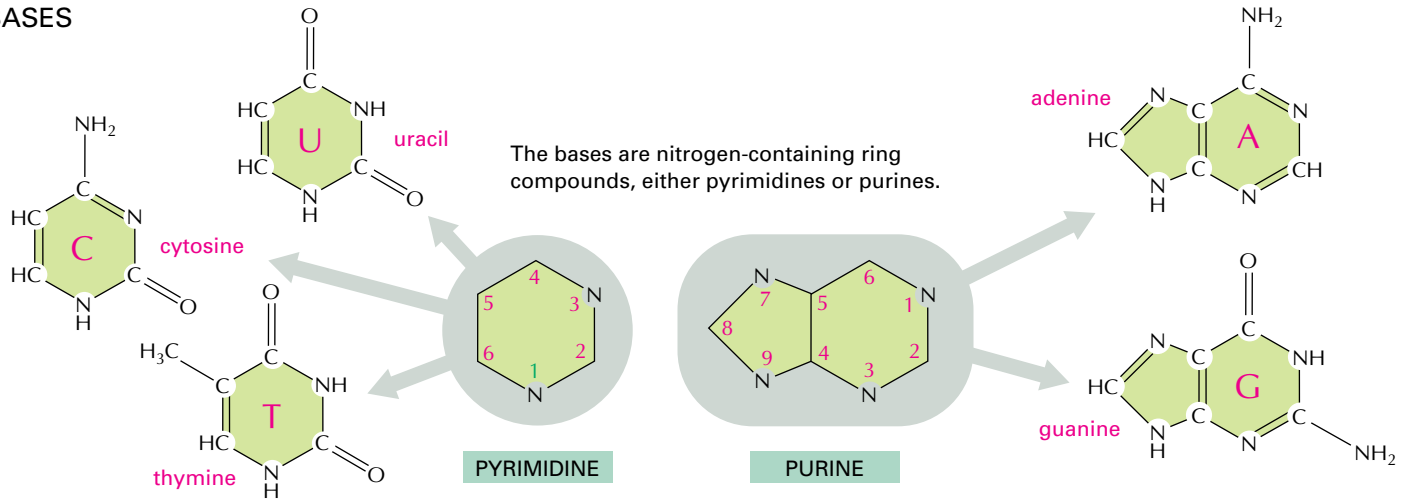


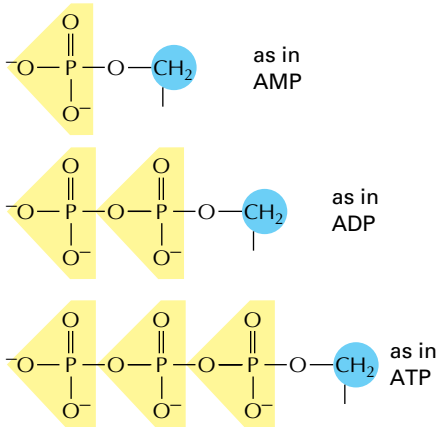
Panel 2–6 A survey of the nucleotides

BASES



PHOSPHATES

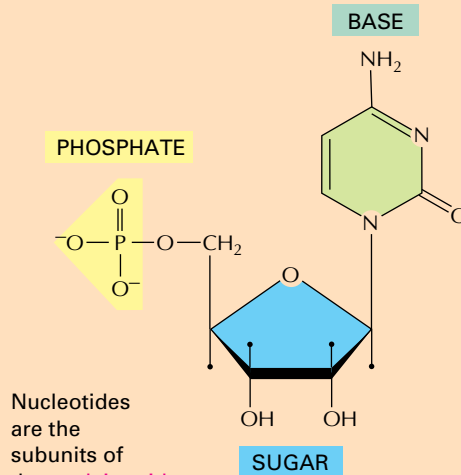
The phosphates are normally joined to the C5 hydroxyl of the ribose or deoxyribose sugar (designated 5'). Mono-, di-, and triphosphates are common.



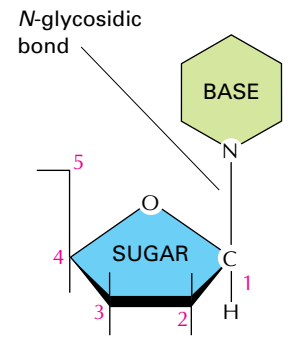
The phosphate makes a nucleotide negatively charged.

NUCLEOTIDES

A nucleotide consists of a nitrogen-containing base, a five-carbon sugar, and one or more phosphate groups.



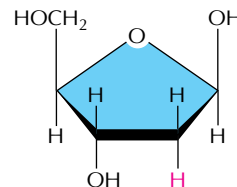
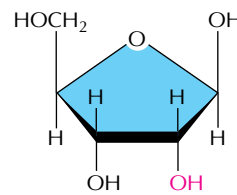
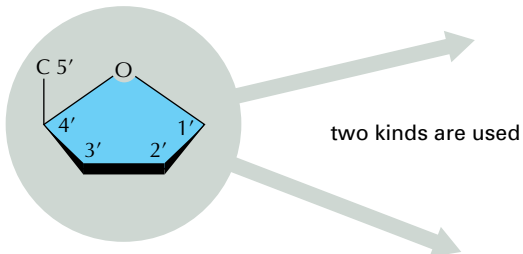
BASIC SUGAR LINKAGE



The base is linked to the same carbon (C1') used in sugar-sugar bonds.

SUGARS

PENTOSE
a five-carbon sugar



Each numbered carbon on the sugar of a nucleotide is followed by a prime mark; therefore, one speaks of the "5-prime carbon," etc.

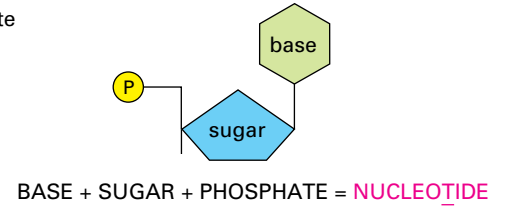
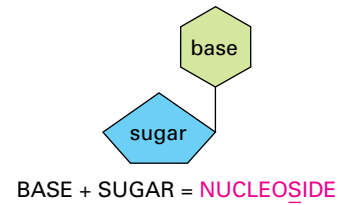
NOMENCLATURE

The names can be confusing, but the abbreviations are clear.

BASE	NUCLEOSIDE	ABBR.
adenine	adenosine	A
guanine	guanosine	G
cytosine	cytidine	C
uracil	uridine	U
thymine	thymidine	T

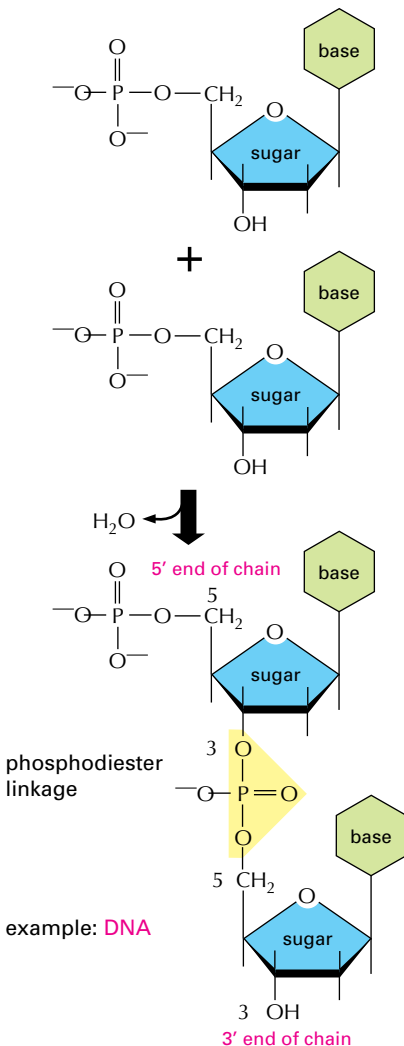
Nucleotides are abbreviated by three capital letters. Some examples follow:

AMP = adenosine monophosphate
 dAMP = deoxyadenosine monophosphate
 UDP = uridine diphosphate
 ATP = adenosine triphosphate



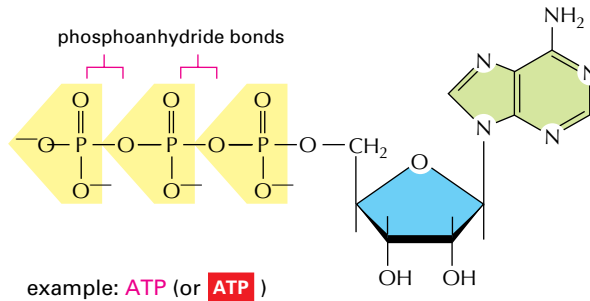
NUCLEIC ACIDS

Nucleotides are joined together by a **phosphodiester linkage** between 5' and 3' carbon atoms to form nucleic acids. The linear sequence of nucleotides in a nucleic acid chain is commonly abbreviated by a one-letter code, A-G-C-T-T-A-C-A, with the 5' end of the chain at the left.

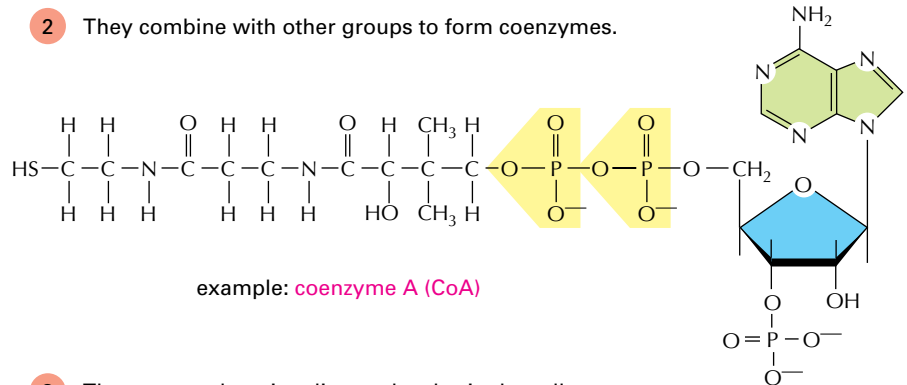


NUCLEOTIDES HAVE MANY OTHER FUNCTIONS

- 1 They carry chemical energy in their easily hydrolyzed phosphoanhydride bonds.



- 2 They combine with other groups to form coenzymes.



- 3 They are used as signaling molecules in the cell.

