

DNA, the molecule



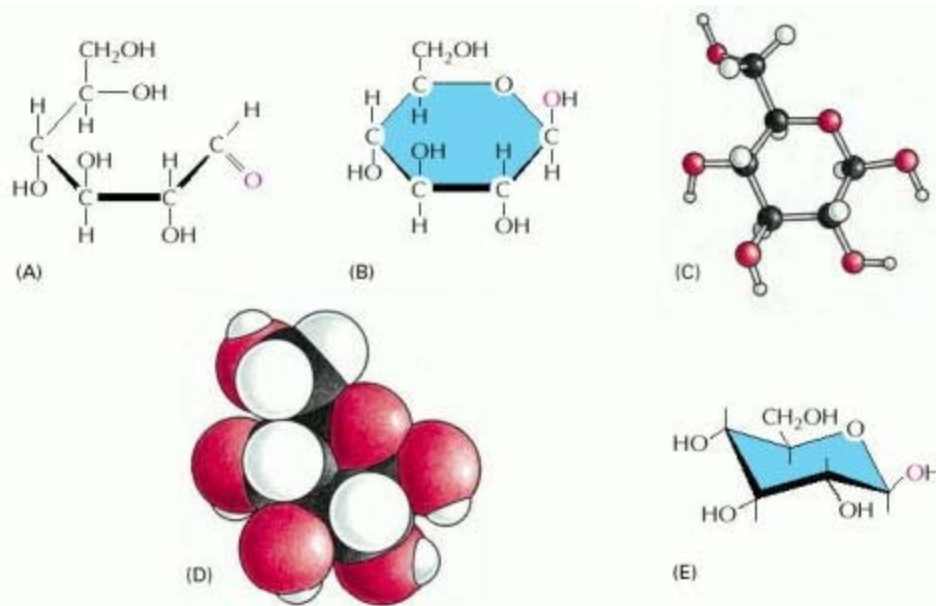
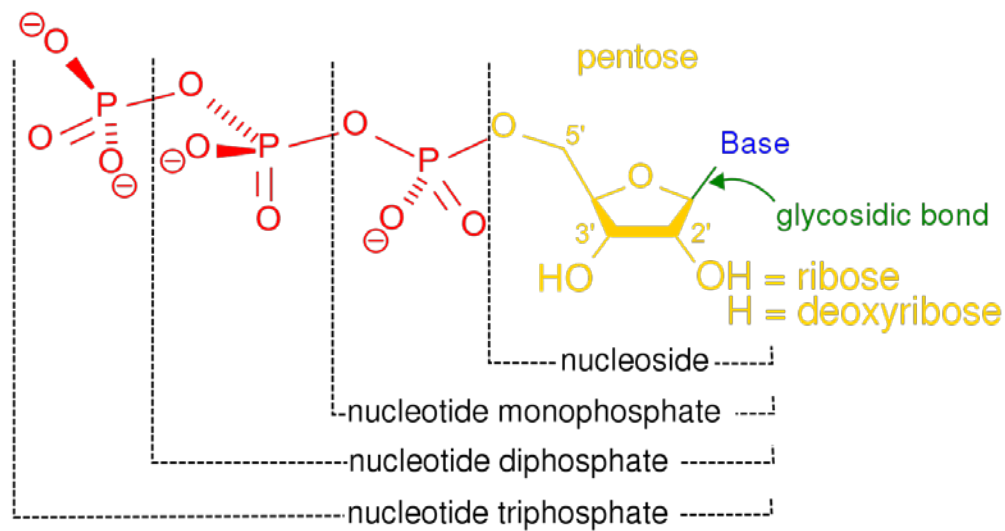


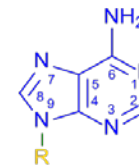
Figure 2-18

• **The structure of glucose, a simple sugar**

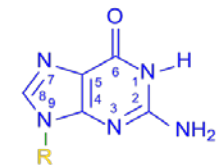
As illustrated previously for water (see [Figure 2-12](#)), any [molecule](#) can be represented in several ways. In the structural formulas shown in (A), (B) and (E), the atoms are shown as chemical symbols linked together by lines representing the [covalent bonds](#). The *thickened lines* here are used to indicate the plane of the [sugar](#) ring, in an attempt to emphasize that the -H and -OH groups are not in the same plane as the ring. (A) The open-chain form of this [sugar](#), which is in [equilibrium](#) with the more stable cyclic or ring form in (B). (C) A ball-and-stick model in which the three-dimensional arrangement of the atoms in space is shown. (D) A space-filling model, which, as well as depicting the three-dimensional arrangement of the atoms, also uses the van der Waals radii to represent the surface contours of the [molecule](#). (E) The chair form is an alternative way to draw the cyclic [molecule](#) that reflects the geometry more accurately than the structural formula in (B). The atoms in (C) and (D) are drawn according to the conventional color coding for atoms. For example, these colors are H, *white*; C, *black*; O, *red*; N, *blue* (see also [Figure 2-8](#)).



Purines

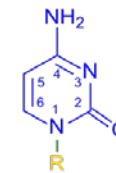


Adenine

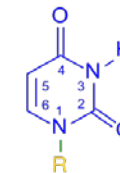


Guanine

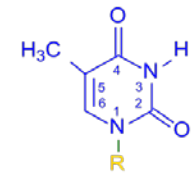
Pyrimidines



Cytosine



Uracil



Thymine

The structure elements of the nucleosides and the phosphate group bearing nucleotides

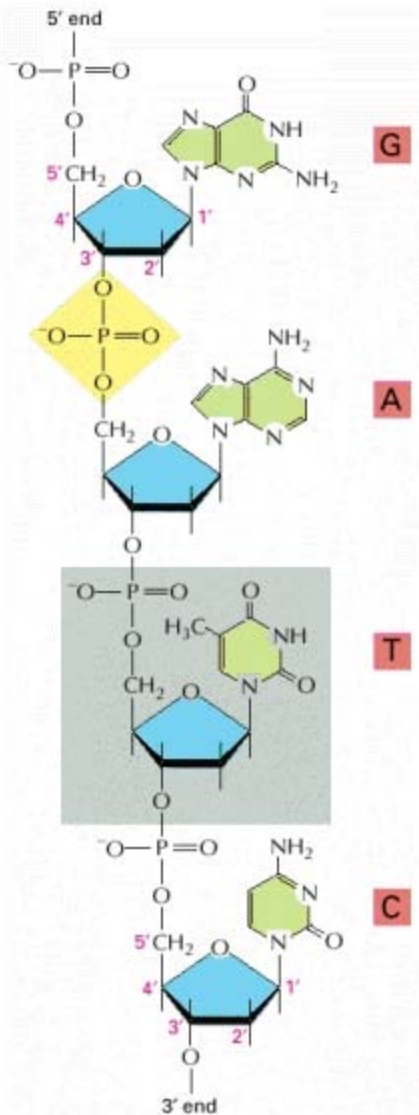


Figure 2-28

. A small part of one chain of a deoxyribonucleic acid (DNA) molecule

Four nucleotides are shown. One of the phosphodiester bonds that links adjacent nucleotide residues is highlighted in *yellow*, and one of the nucleotides is shaded in *gray*.

Nucleotides are linked together by a phosphodiester linkage between specific carbon atoms of the ribose, known as the 5' and 3' atoms. For this reason, one end of a polynucleotide chain, the 5' end, will have a free phosphate group and the other, the 3' end, a free hydroxyl group. The linear sequence of nucleotides in a polynucleotide chain is commonly abbreviated by a one-letter code, and the sequence is always read from the 5' end. In the example illustrated the sequence is G-A-T-C.

Nucleoside

Adenosine

A

Guanosine

G

Thymidine

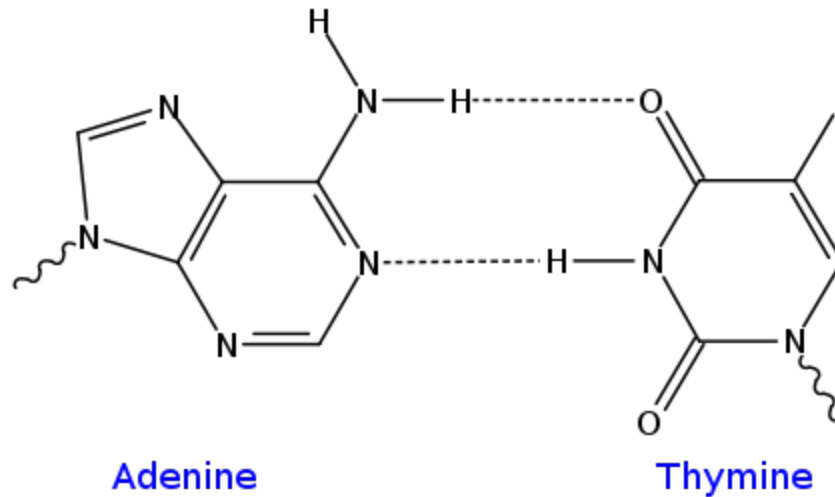
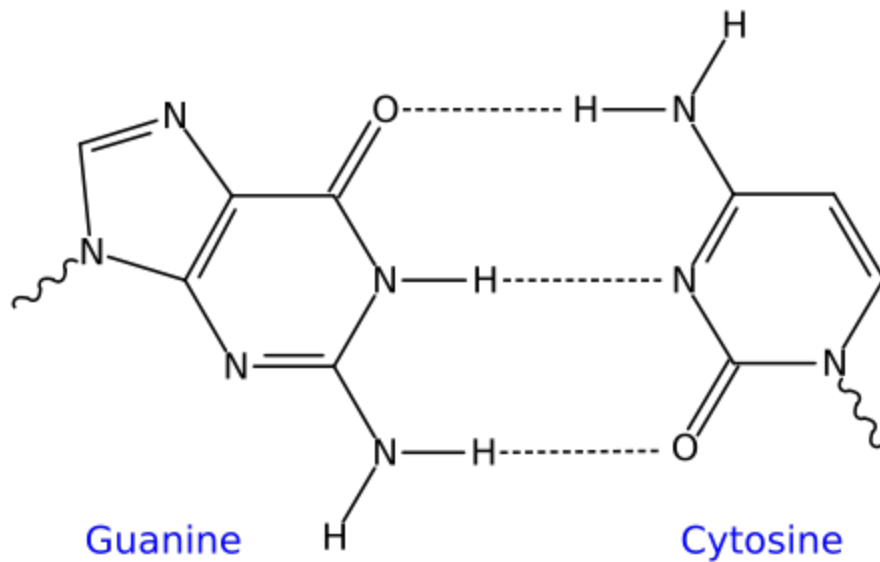
T

Cytidine

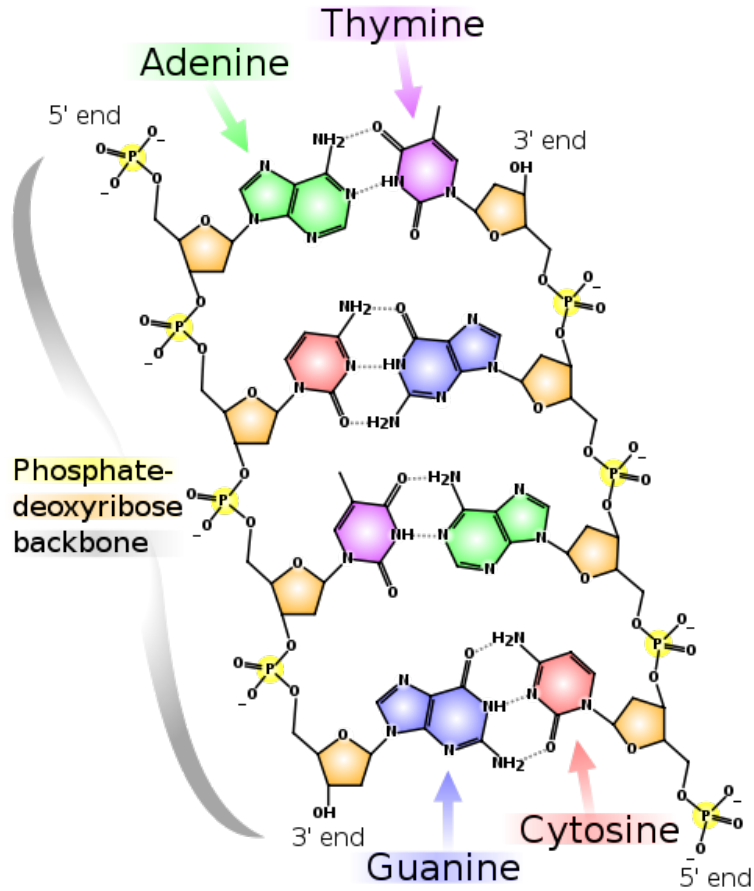
C

Uridine

U

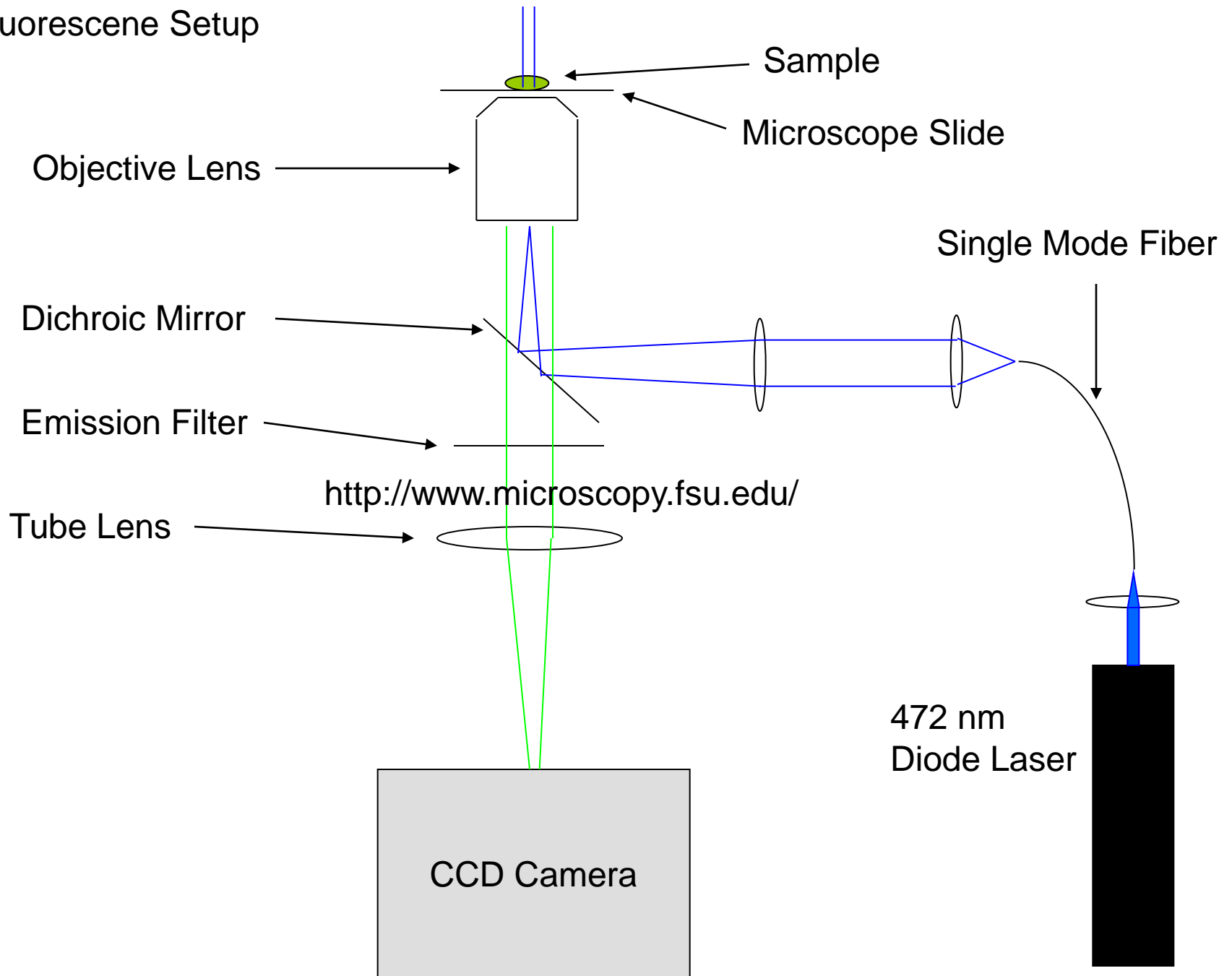


Names are the 'nucleobase', not 'nucleoside'



Names are the 'nucleobase', not 'nucleoside'

Epi-Fluorescence Setup



<http://www.microscopy.fsu.edu/>

Is a great resource for microscopy. For example, this Jablonski Diagram

Is found here: <http://www.microscopy.fsu.edu/primer/java/jablonski/jabintro/index.html>

