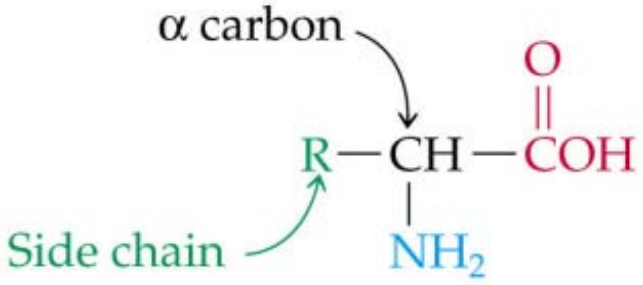
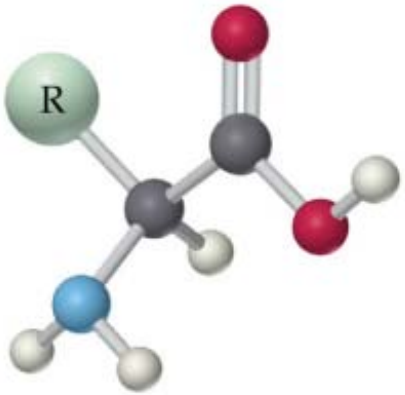
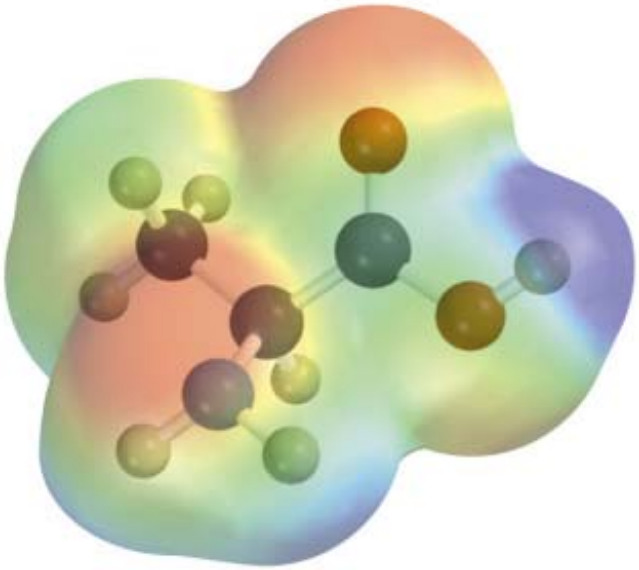
Prinzipielle Struktur von alpha-Aminosäuren

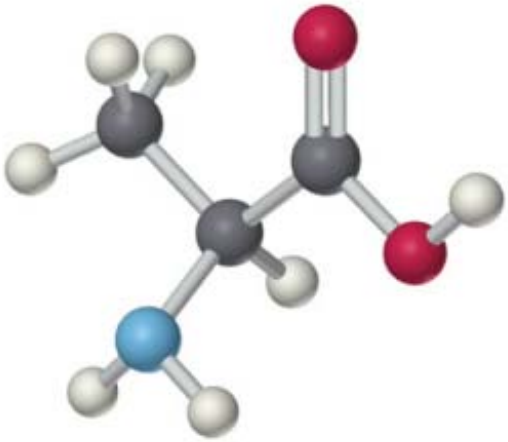


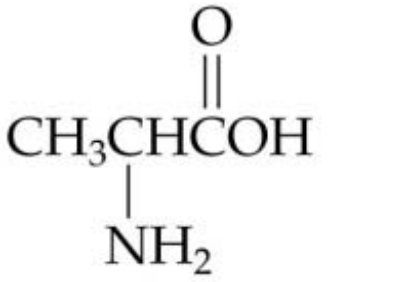
Generalized structure of an α-amino acid



Die einfachste optisch aktive alpha-Aminosäure: Alanin

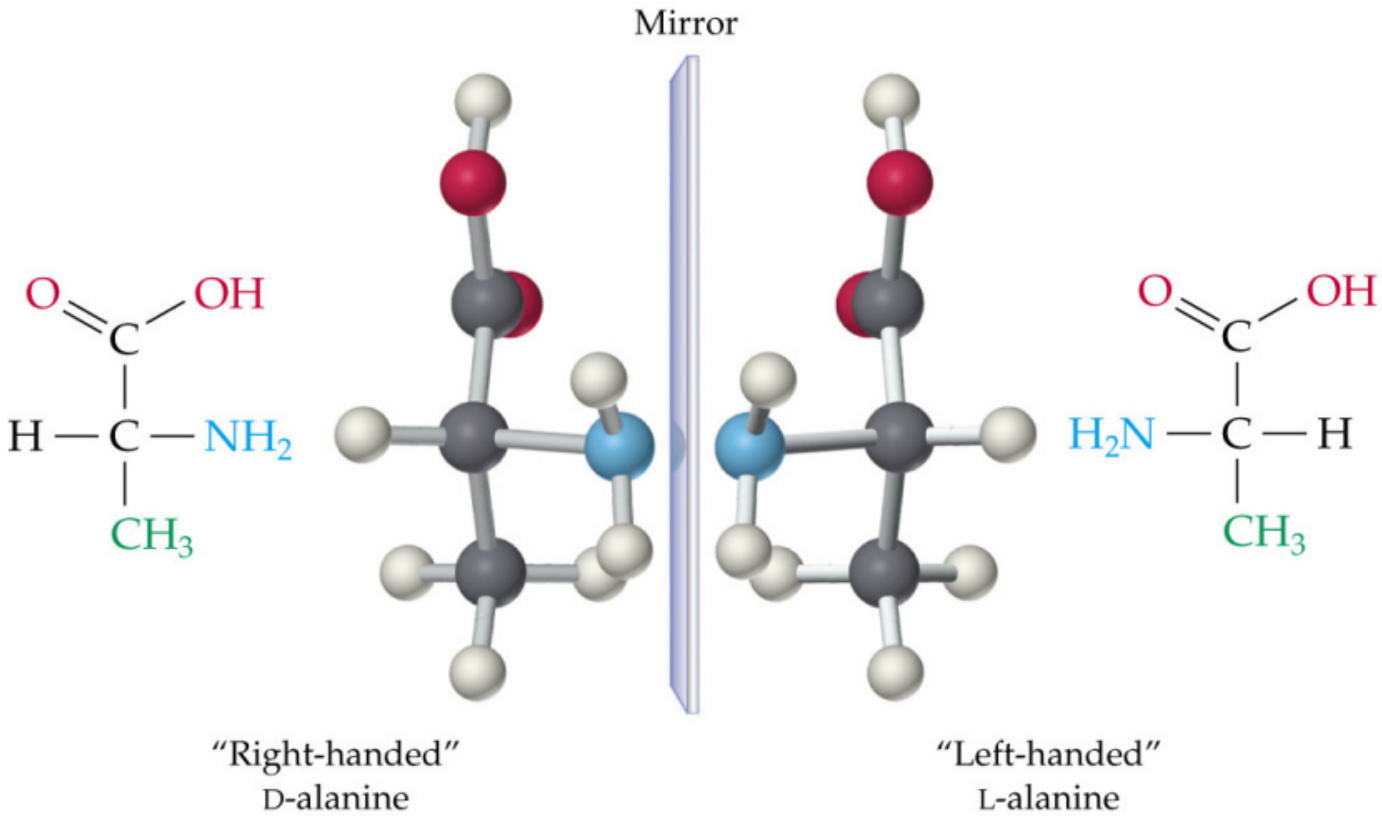






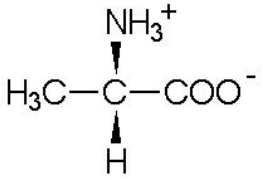
Alanine—an amino acid

D- und L-Form von Alanin (Fischer-Projektion)

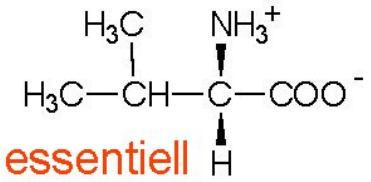


Aminosäuren mit unpolaren Resten = Seitengruppen

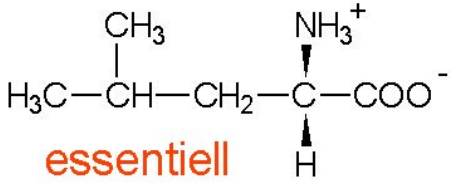
A. mit unpolaren Seitengruppen:



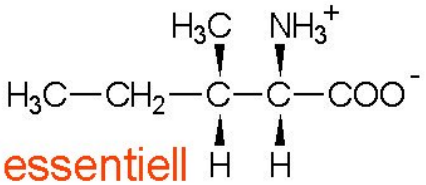
L-Alanin
(Ala,A)



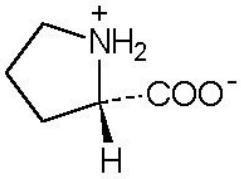
L-Valin
(Val,V)



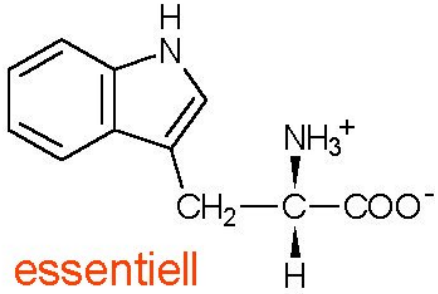
L-Leucin
(Leu,L)



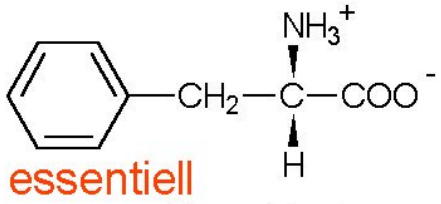
L-Isoleucin
(Ille,I)



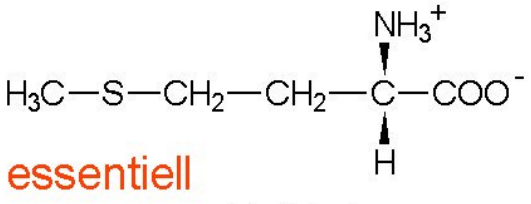
L-Prolin
(Pro,P)



L-Tryptophan
(Trp,W)



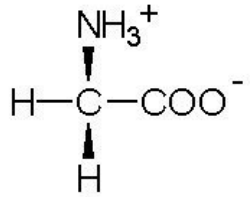
L-Phenylalanin
(Phe,F)



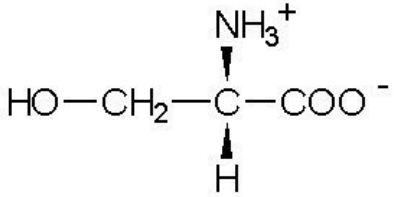
L-Methionin
(Met,M)

Aminosäuren mit polaren ungeladenen Resten = Seitengruppen

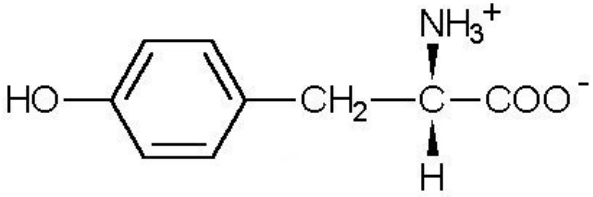
A. mit polaren ungeladenen Seitengruppen:



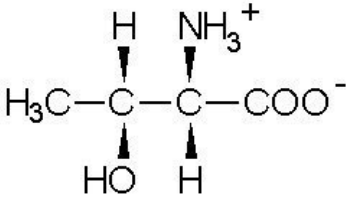
Glycin
(Gly,G)



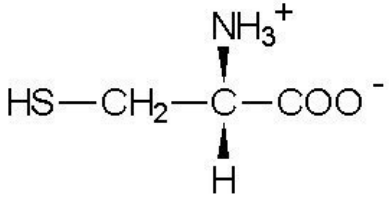
L-Serin
(Ser,S)



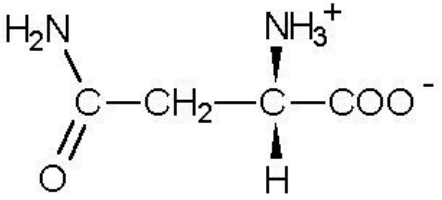
L-Tyrosin
(Tyr,Y)



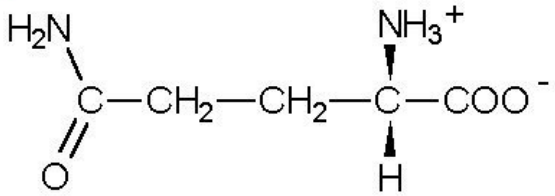
L-Threonin
(Thr,T)
essentiell



L-Cystein
(Cys,C)



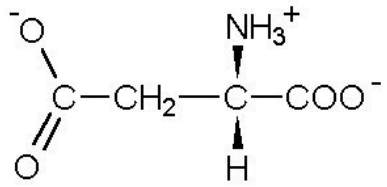
L-Asparagin
(Asn,N)



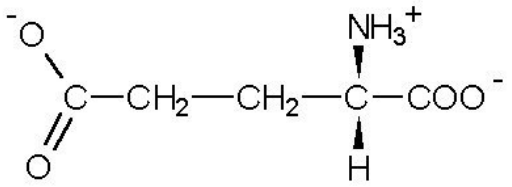
L-Glutamin
(Gln,Q)

Saure Aminosäuren (oben) und basische Aminosäuren (unten)

Saure A. (besitzen neg. geladene Seitengruppen):

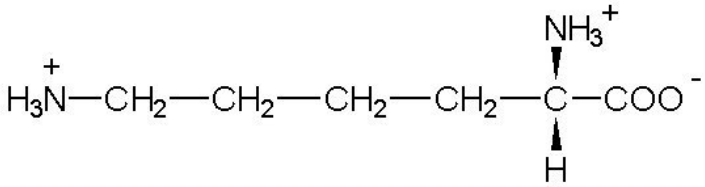


L-Aspartat
(L-Asparaginsäure;Asp,D)

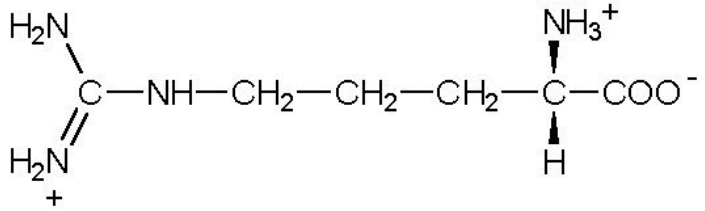


L-Glutamat
(L-Glutaminsäure;Glu,E)

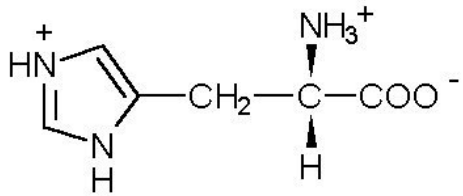
Basische A. (besitzen pos. geladene Seitengruppen):



L-Lysin (Lys,K)
essentiell

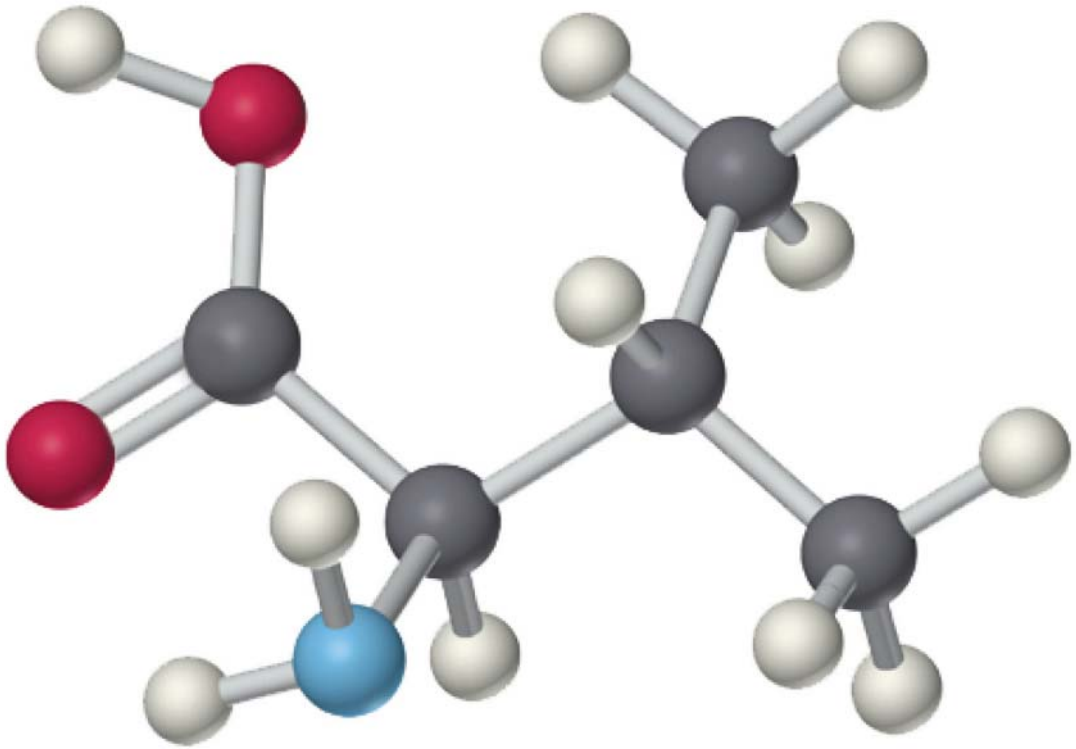


L-Arginin (Arg,R)

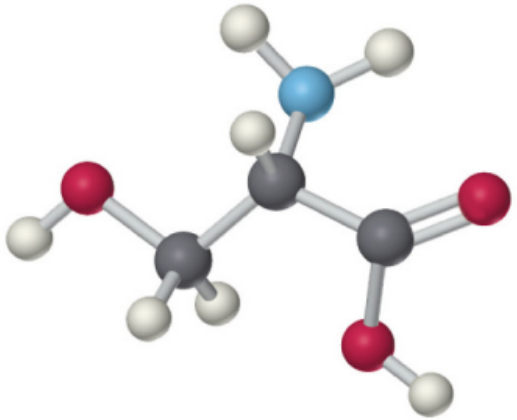


L-Histidin (His,H; bei pH 6)

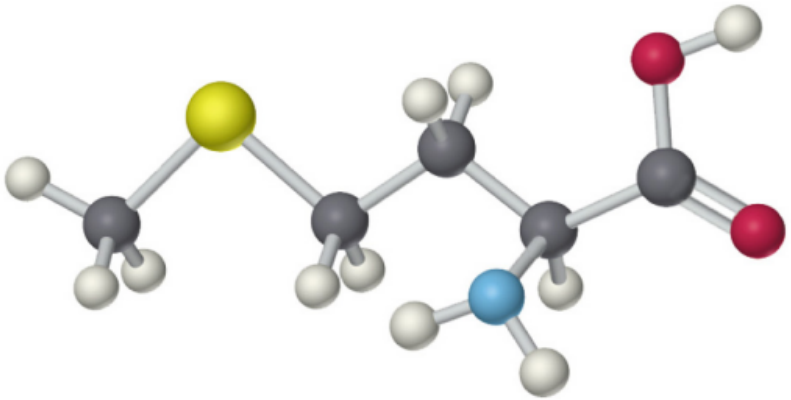
Um welche Aminosäure handelt es sich?



Und um welche Aminosäuren handelt es sich hier?

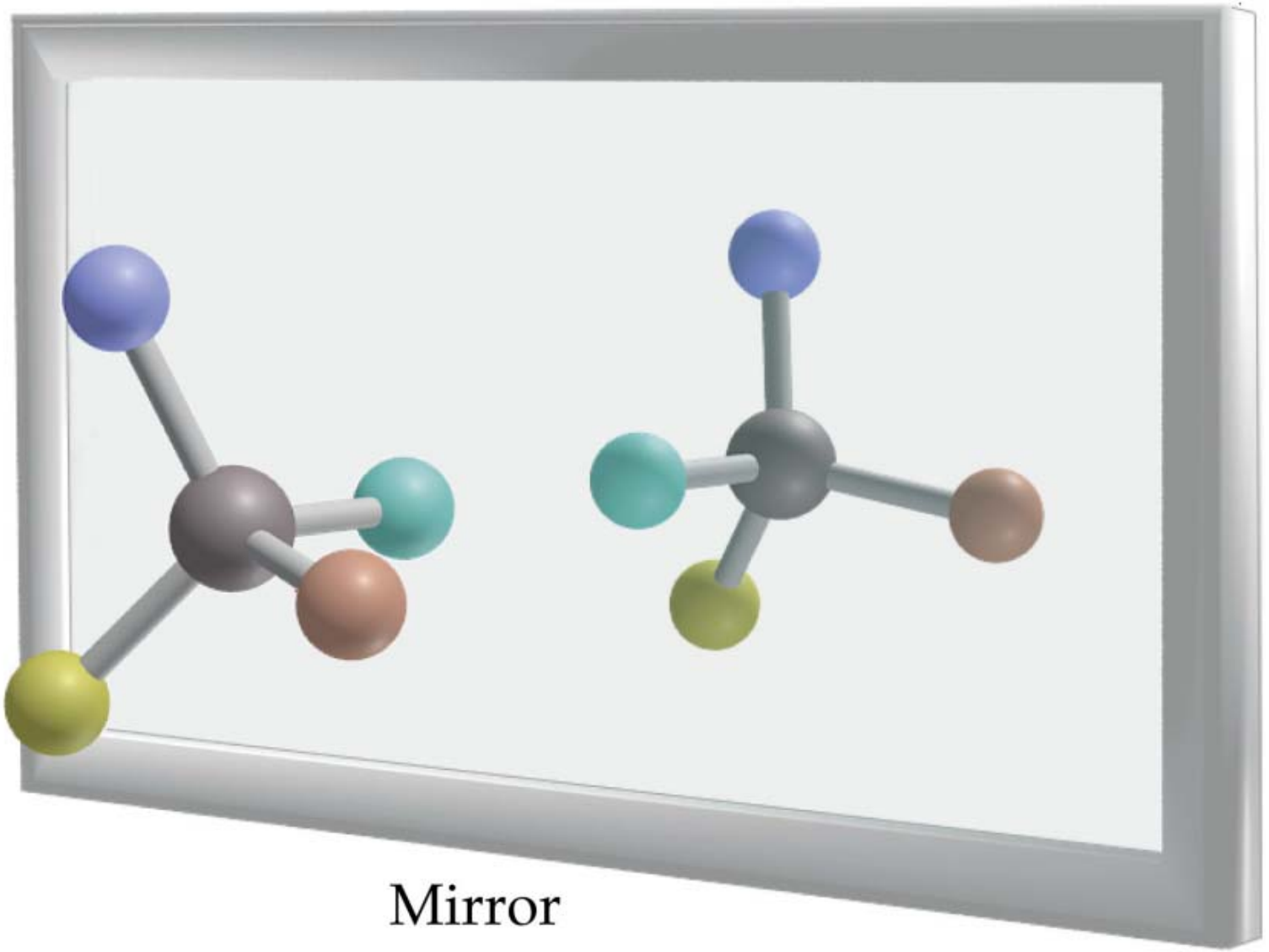


(a)

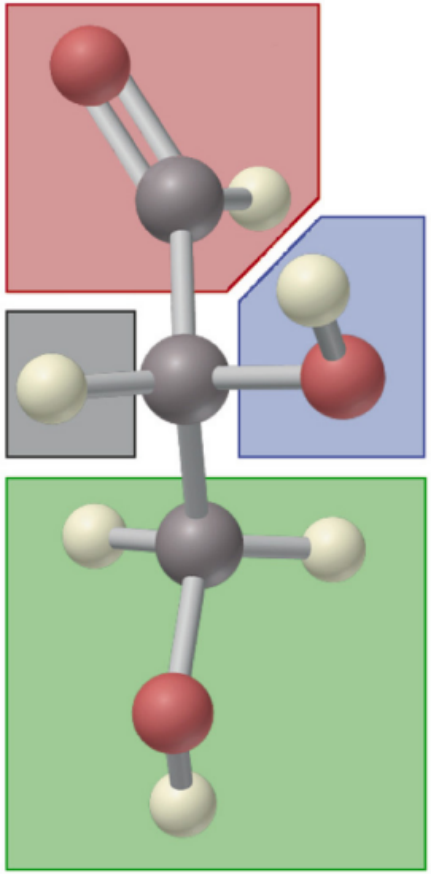


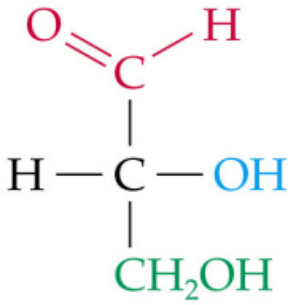
(b)

Bild und Spiegelbild



Glycerinaldehyd: Basis für die Zuordnung D- bzw. L- Form bei einer chiralen Verbindung (mit asymmetrischem C-Atom)



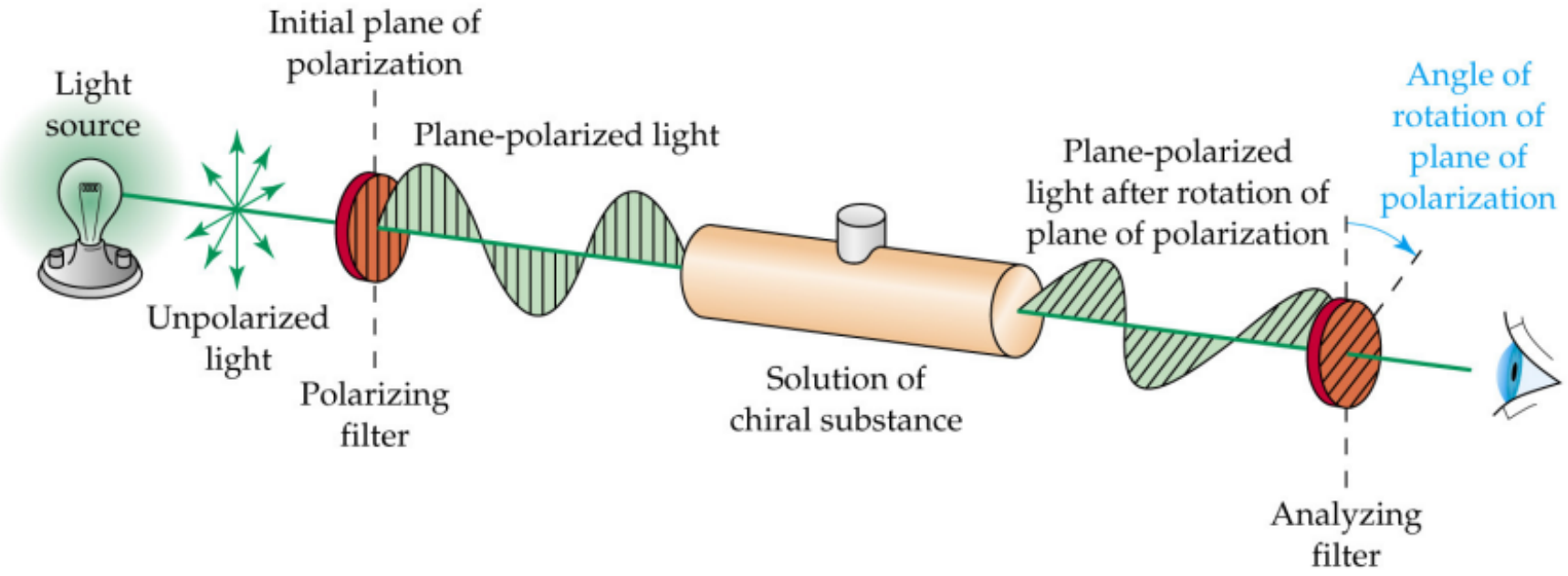


D-Glyceraldehyde

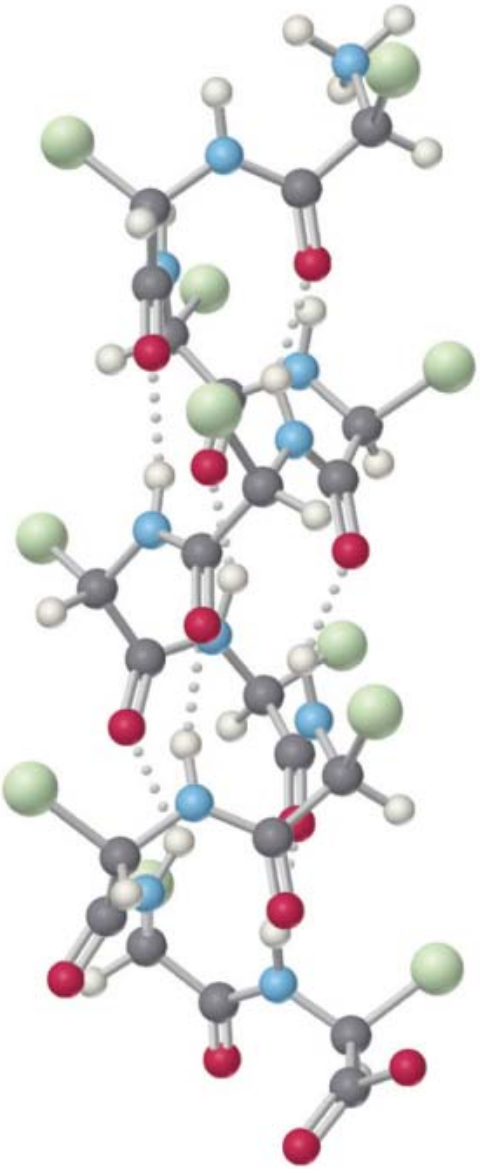
Groups bonded to C2

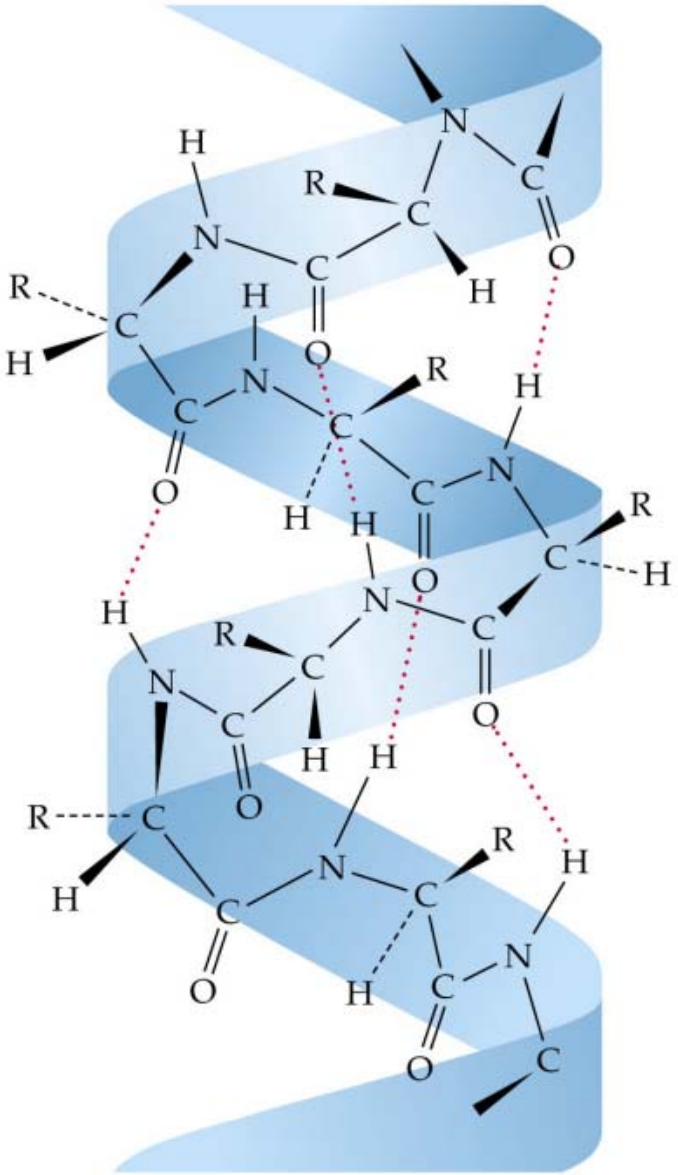
1.—CHO
2.—H
3.—OH
4.—CH_2OH

Prinzip der Polarimetrie

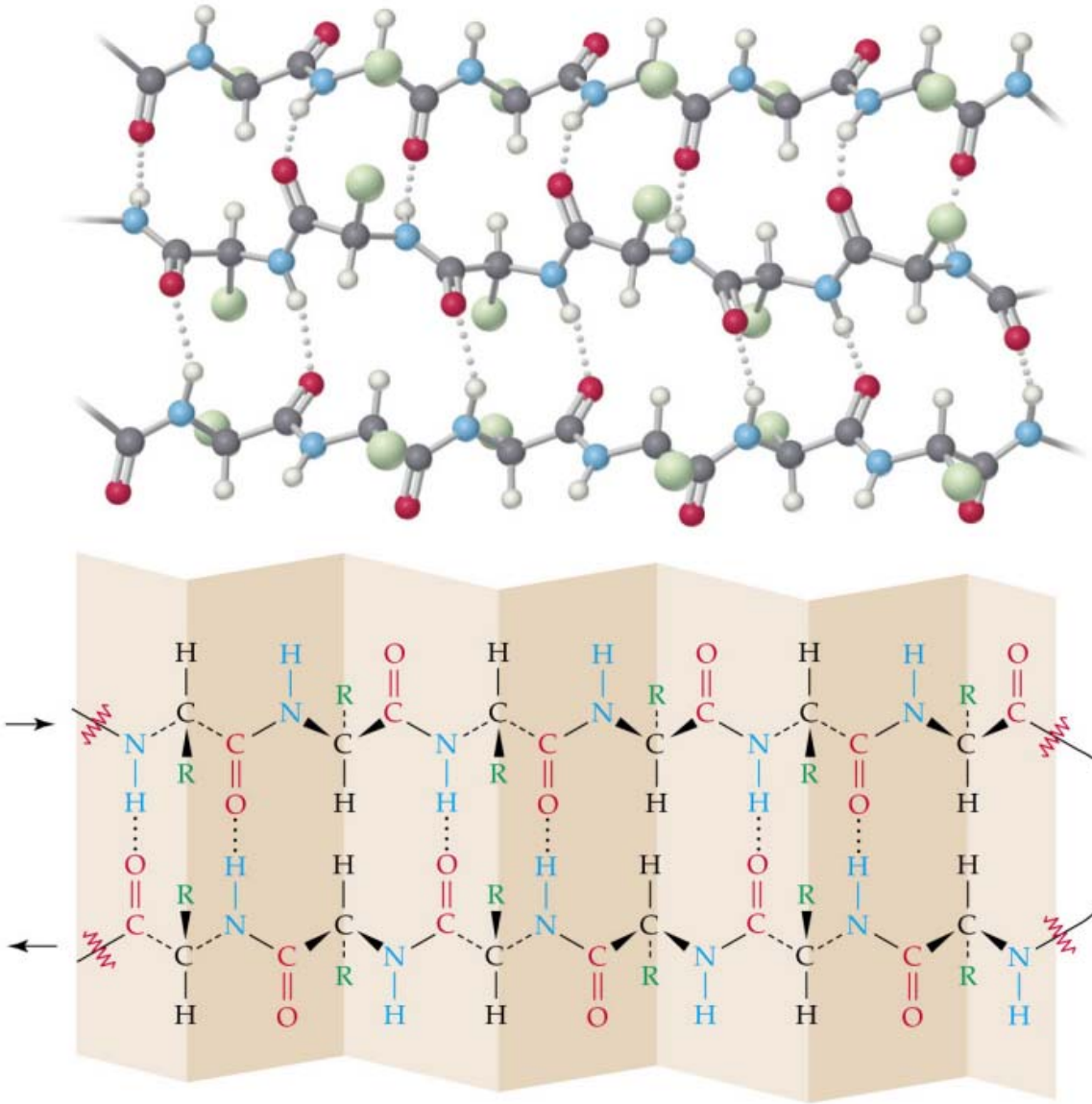


Sekundärstruktur von Proteinen



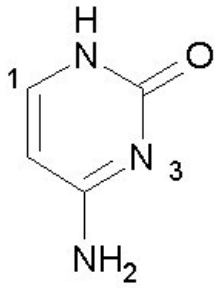


Sekundärstruktur von Proteinen: „Faltblattstruktur“

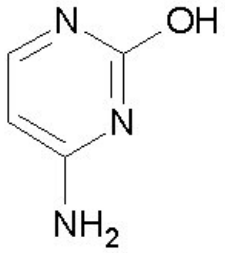


Die Pyrimidin-Basen

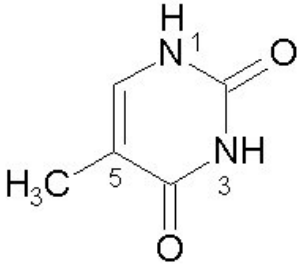
(Uracil in RNA, Thymidin in DNA)



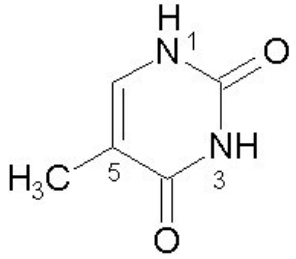
bzw.



Cytosin

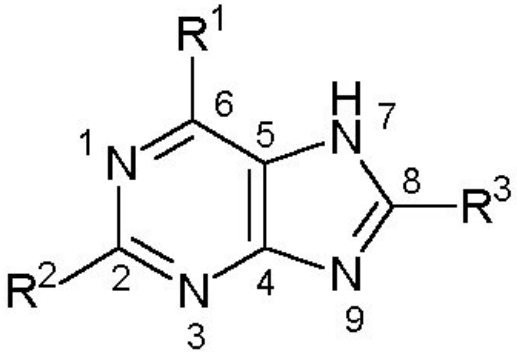


Uracil



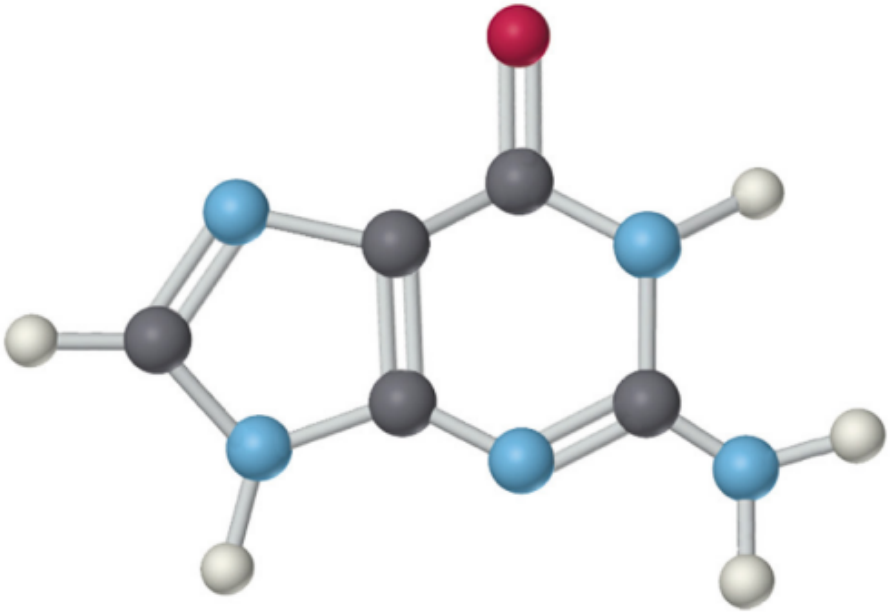
Thymidin

Die Purin-Basen

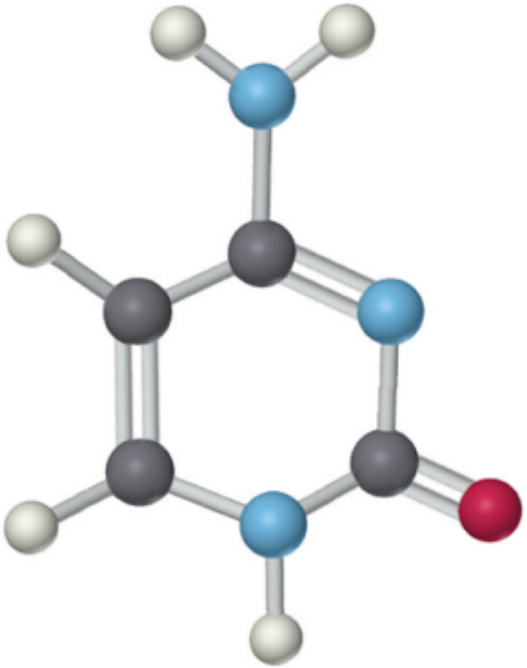


Purin	: $R^1 = R^2 = R^3 = H$
Adenin	: $R^1 = NH_2$, $R^2 = R^3 = H$
Guanin	: $R^1 = OH$, $R^2 = NH_2$, $R^3 = H$
Harnsäure	: $R^1 = R^2 = R^3 = OH$
Hypoxanthin	: $R^1 = OH$, $R^2 = R^3 = H$
6-Purinthiol	: $R^1 = SH$, $R^2 = R^3 = H$
6-Thioguanin	: $R^1 = SH$, $R^2 = NH_2$, $R^3 = H$
Xanthin	: $R^1 = R^2 = OH$, $R^3 = H$

Um welche Purin-Base (a) bzw. Pyrimidin-Base (b) handelt es sich?

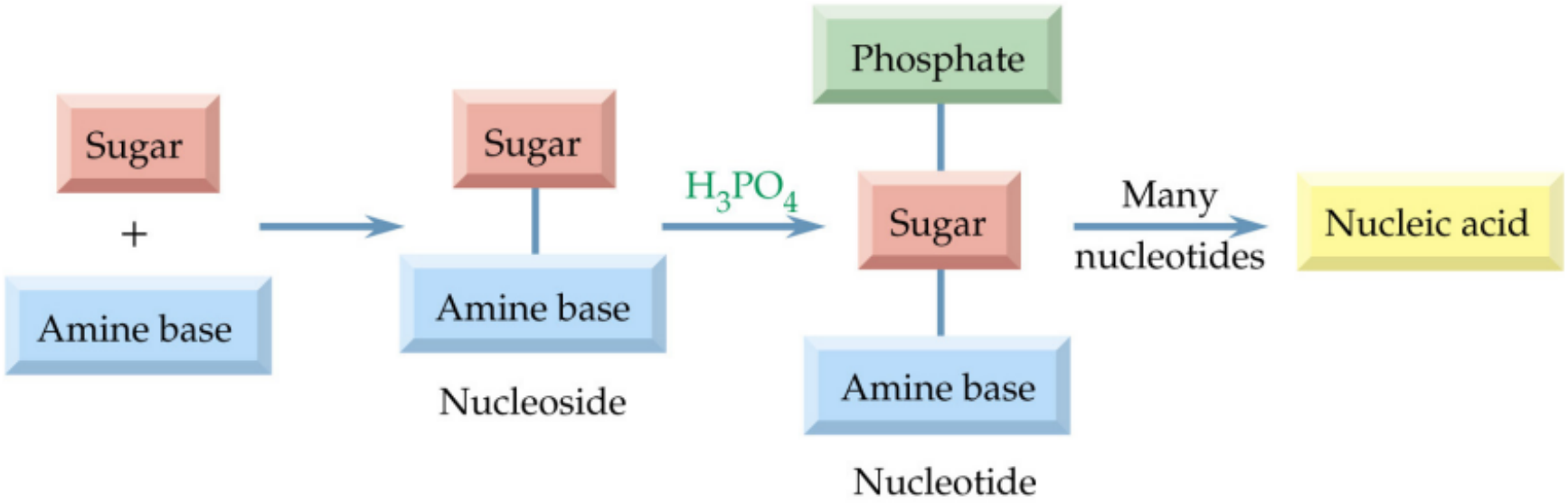


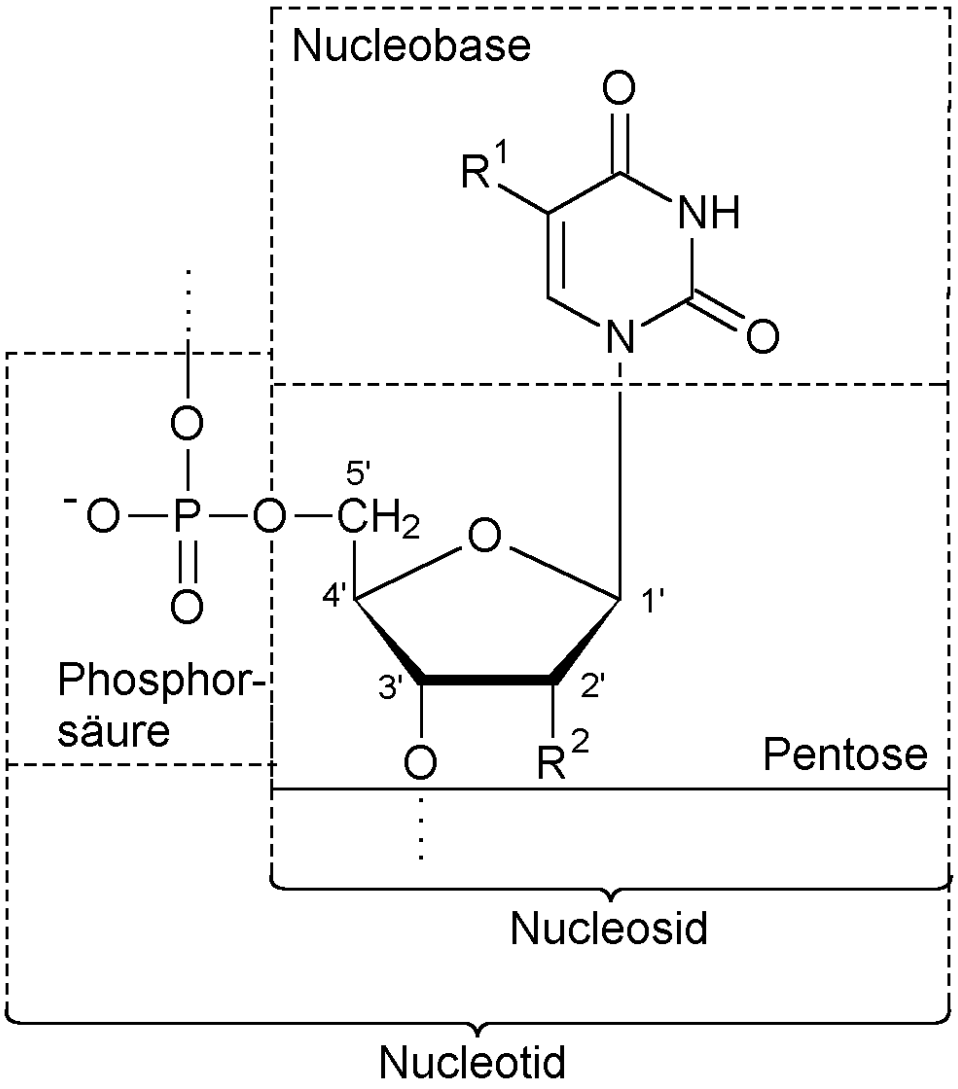
(a)

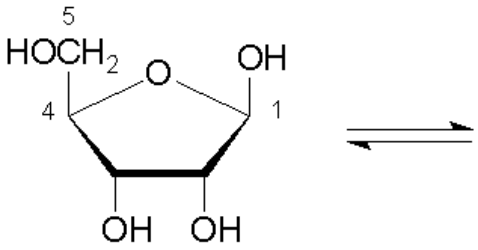


(b)

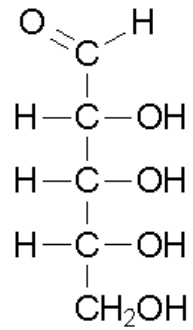
Bausteine der Bildung von Nucleinsäuren



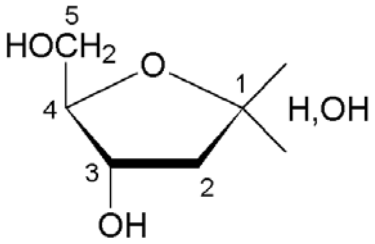




β-D-Ribofuranose



D-Ribose

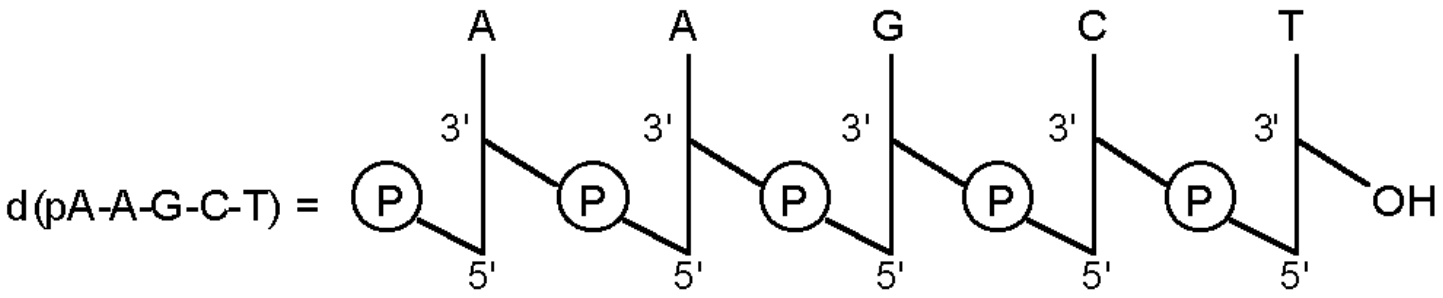


β-D-Desoxyribose

Kurze DNA-Sequenz:

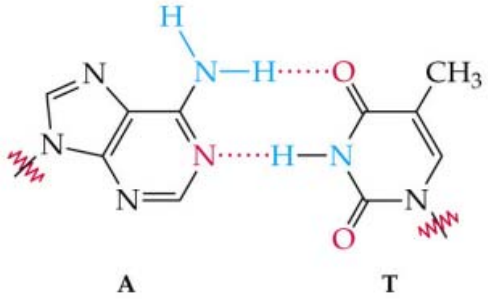
Desoxyribose und Phosphat bilden das „Rückgrat“

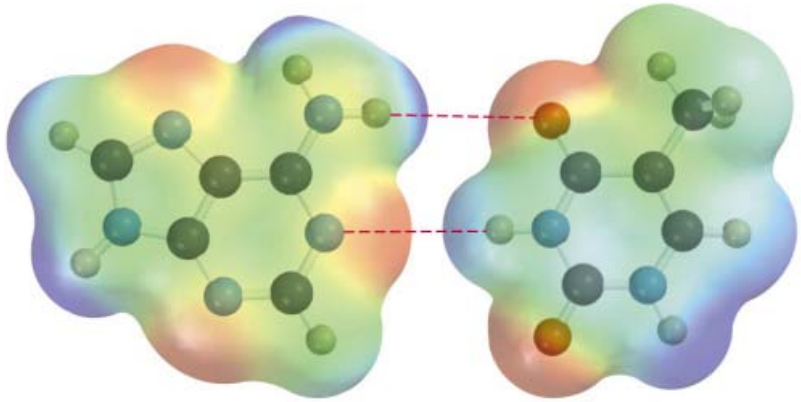
In der Abfolge der Basen A, C, G, T ist die genetische Information verschlüsselt

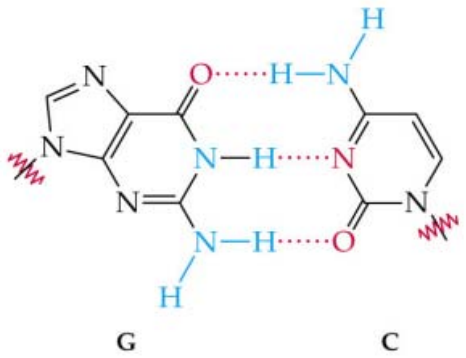


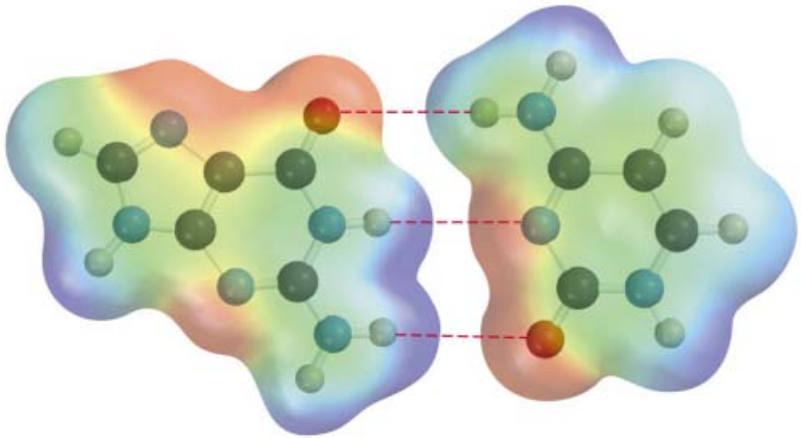
Die Basen C-G bzw. A-T bilden jeweils Paare

(Doppelstrang-Struktur)

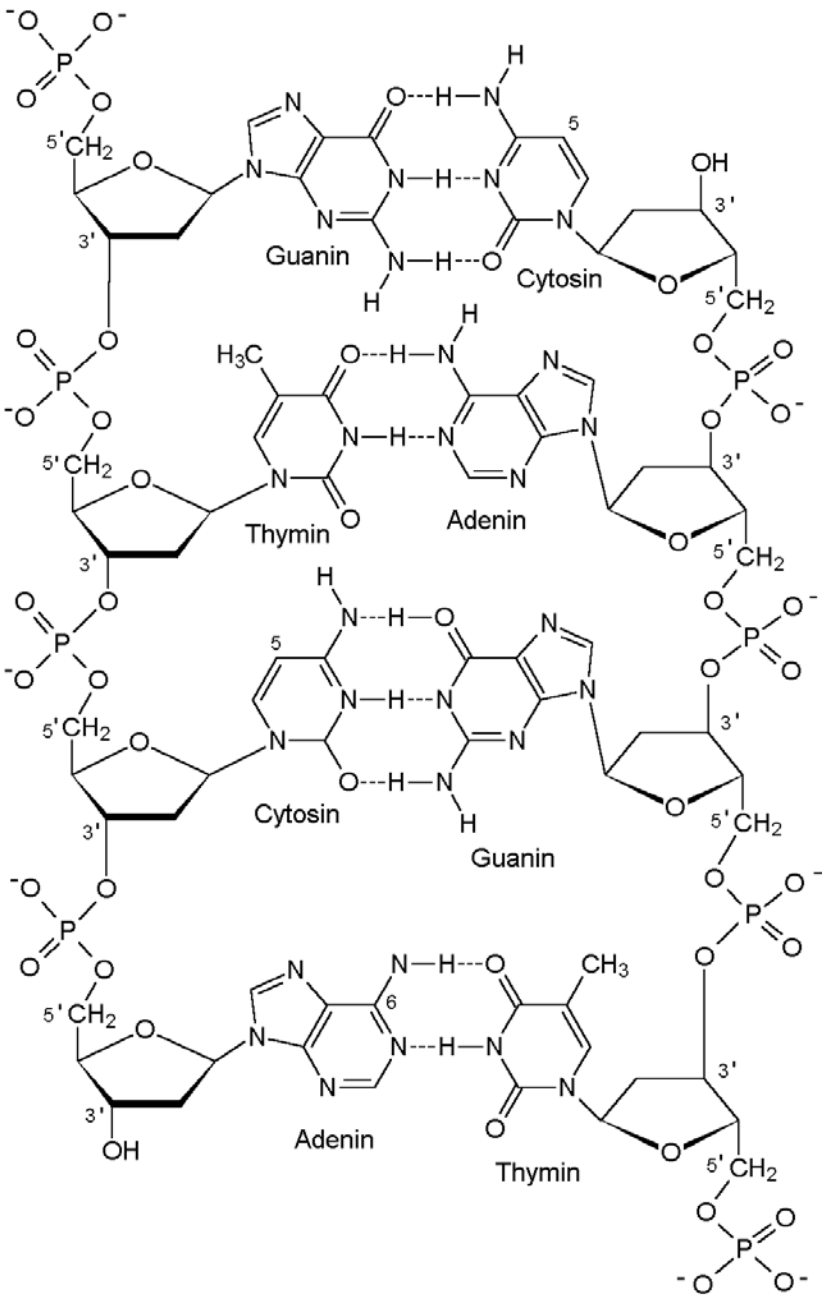




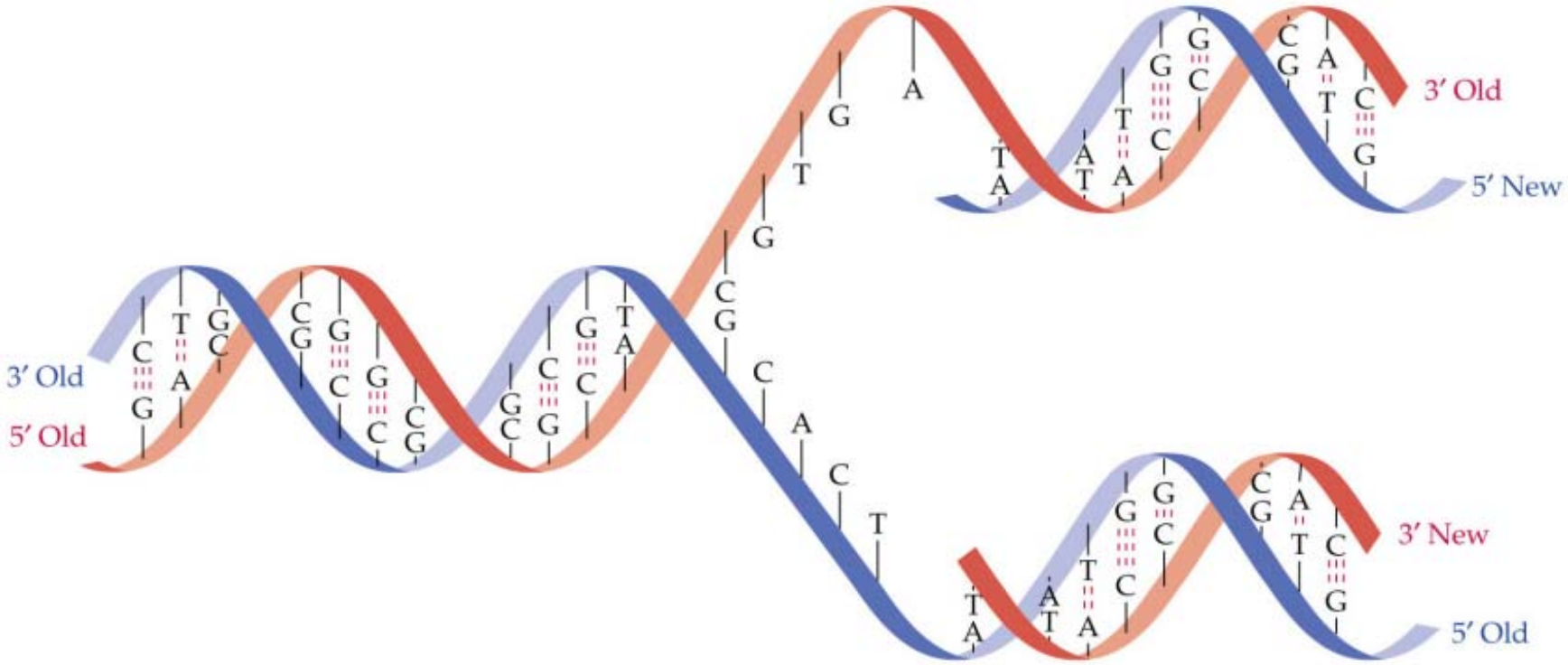




Kurzer Ausschnitt aus einem Doppelstrang einer DNA



Duplikation (Replikation) eines DNA-Strangs



Replikation: siehe vorherige Folie = Verdoppelung der DNA

Transkription: RNA-Synthese aus dem Code der DNA (vermittelt durch RNA-Polymerase)

Translation: Übersetzung des Codes der RNA (Messenger-RNA) in Aminosäuren bzw. Peptide (Proteine)