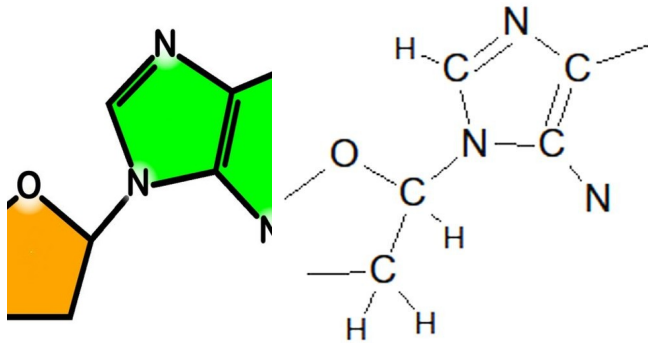


Entschlüsselung des Feinbaus der DNA

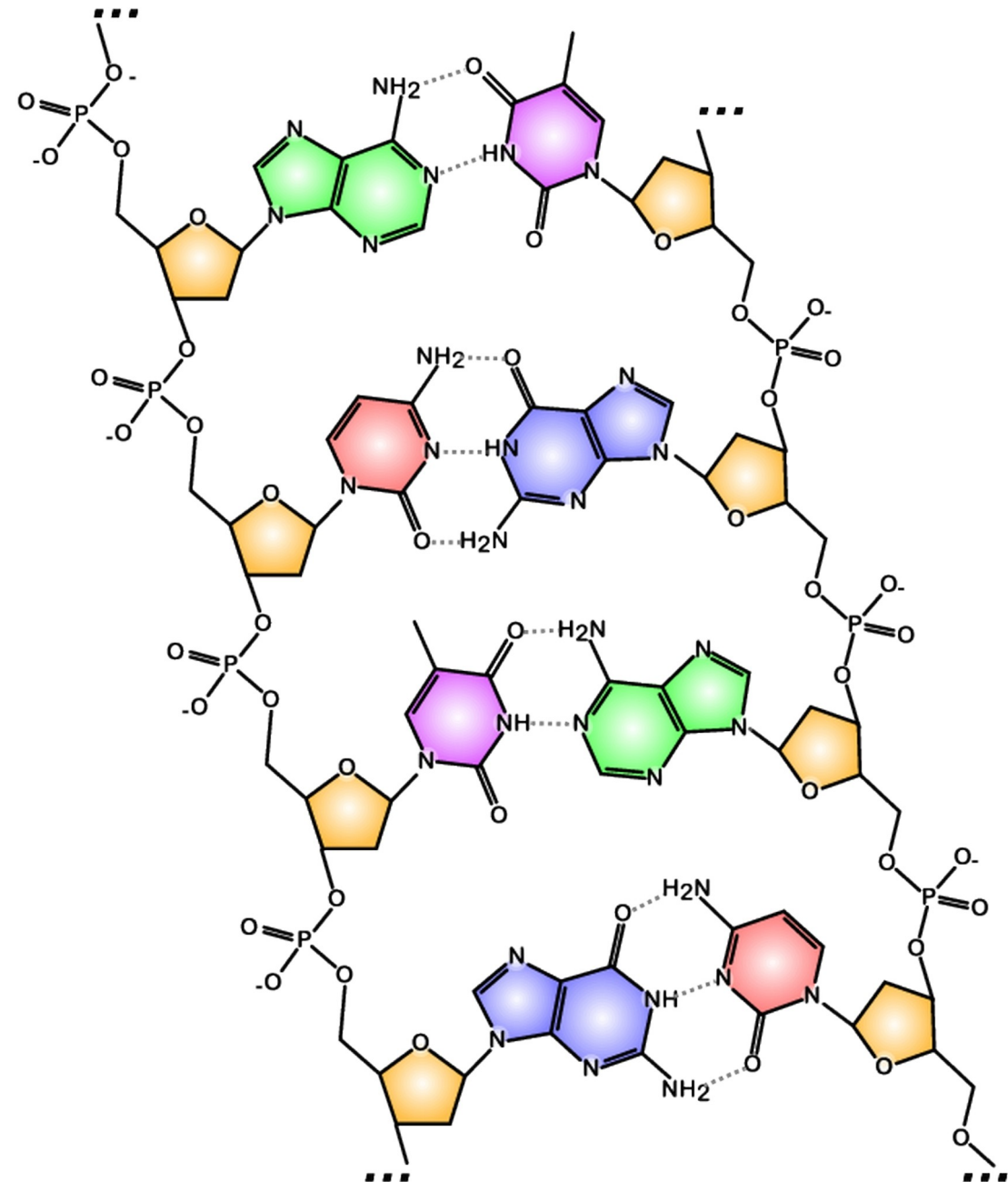
Die Abbildung rechts zeigt die Strukturformel eines Stücks DNA, dargestellt in **Skelettschreibweise (Skelettformel)**.

1. Für welche Atomgruppe steht jede Ecke/Knick in der Skelettformel? Tipp: Vergleichen Sie die Ausschnitte:



Lesen Sie zuerst die Infos auf dem Miniplakat (siehe Folgeseite). Die Box unten rechts („From DNA to Proteins“) können Sie ignorieren.

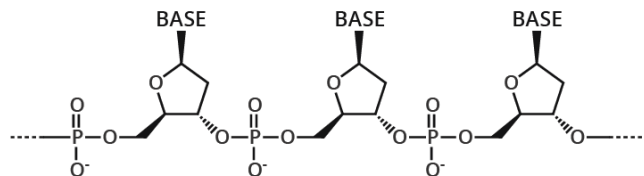
2. Wie werden die beiden Stränge zusammengehalten?
3. Beschriften Sie die vier Nucleinbasen mit den Bezeichnungen.
4. Die fünfeckigen gelben Ringstrukturen sind verbaute Zuckermoleküle. Der Zucker heißt Desoxyribose. Beschriften Sie eine solche Ringstruktur.
5. Markieren Sie ein Nucleotid.
6. Jeder DNA-Strang hat zwei unterscheidbare Enden (3' und 5'), so wie es in einem Wort einen Anfangs- und einen Endbuchstabe gibt. Welches Strukturmerkmal ist für diese Asymmetrie verantwortlich?
7. Durch einen copy-and-paste-Fehler ist der rechte Strang verloren gegangen? Kann er anhand des linken Strangs regeneriert werden?



THE CHEMICAL STRUCTURE OF DNA

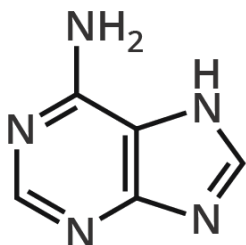
DNA (deoxyribonucleic acid) carries genetic information in all multicellular forms of life. It carries instructions for the creation of proteins, which carry out a wide range of roles in the body.

THE SUGAR PHOSPHATE 'BACKBONE'

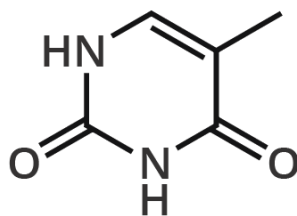


DNA is a polymer made up of units called nucleotides. The nucleotides are made of three different components: a sugar group, a phosphate group, and a base. There are four different bases: adenine, thymine, guanine & cytosine.

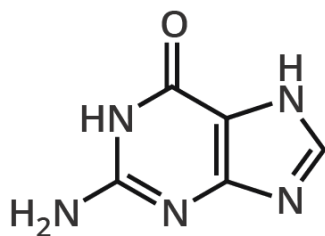
A ADENINE



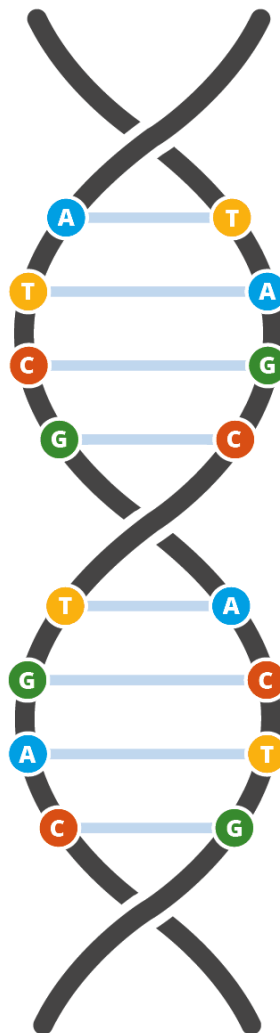
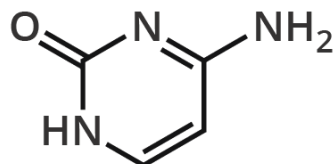
T THYMINE



G GUANINE

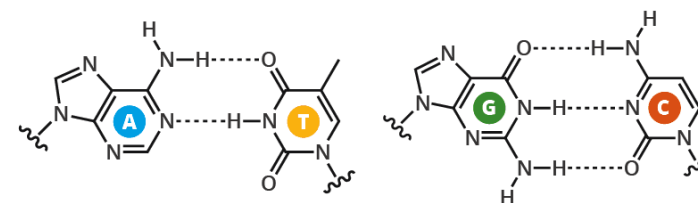


C CYTOSINE



WHAT HOLDS DNA STRANDS TOGETHER?

DNA strands are held together by hydrogen bonds between bases on adjacent strands. Adenine (A) always pairs with thymine (T), whilst guanine (G) always pairs with cytosine (C).



FROM DNA TO PROTEINS



The bases along a single strand of DNA act as a code. The letters form three letter 'words', or codons, which code for different amino acids - the building blocks of proteins.

An enzyme, RNA polymerase, transcribes DNA into mRNA (messenger ribonucleic acid). It does this by splitting apart the two strands that form the double helix, then reading a strand and copying the sequence of nucleotides. The only difference between the RNA and the original DNA is that in the place of thymine (T), another base with a similar structure is used: uracil (U).

DNA SEQUENCE	T	T	C	C	T	G	A	A	C	C	C	G	T	T	A
mRNA SEQUENCE	U	U	C	C	U	G	A	A	C	C	C	G	U	U	A
AMINO ACID	Phenylalanine		Leucine		Asparagine	Proline		Leucine							

In multicellular organisms, the mRNA carries genetic code out of the nucleus, to the cell's cytoplasm. Here, protein synthesis takes place. 'Translation' is the process of converting turning the mRNA's 'code' into proteins. Molecules called ribosomes carry out this process, building up proteins from the amino acids coded for.

