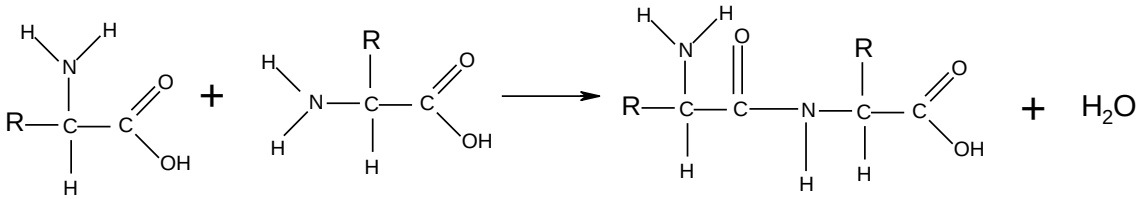
CONDENSATION REACTIONS OF AMINO ACIDS

Amines undergo condensation reactions with acyl chlorides and acid anhydrides.

Carboxylic acids are less reactive than acyl chlorides and acid anhydrides but can still undergo a similar reaction with amines under certain conditions inside living organisms.

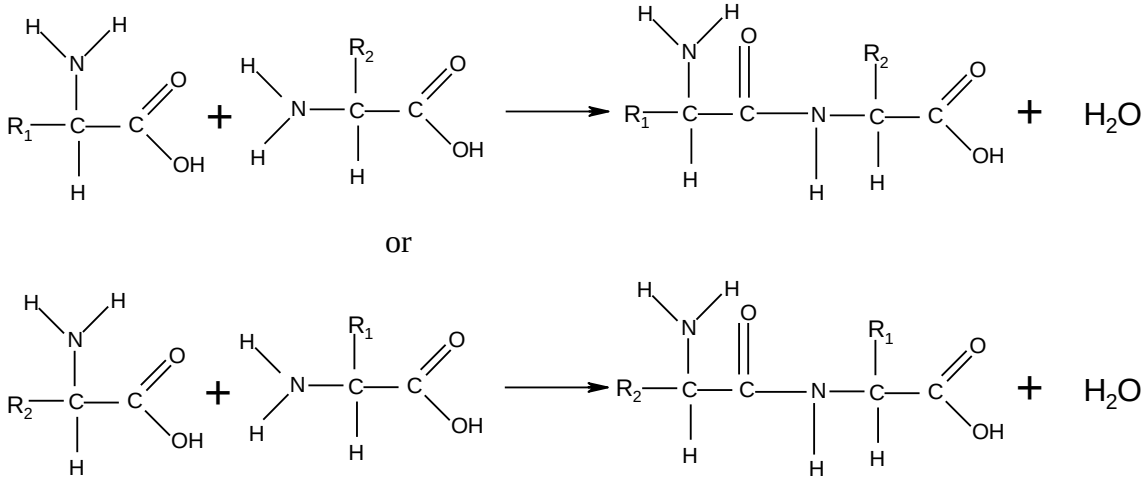
Since amino acids have both acid and amine groups, two molecules can therefore react with each other to form a molecule containing a peptide or amide link:



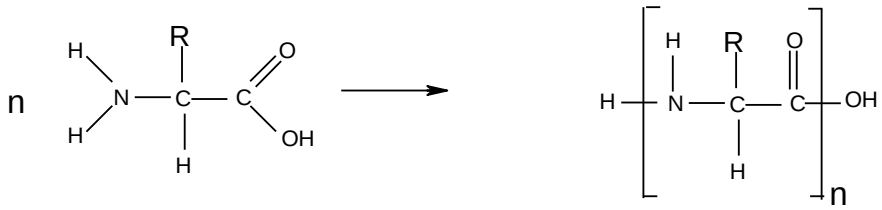
This reaction is called a condensation reaction because two amino acid molecules join together and one molecule of water is eliminated.

The resulting molecule is called a **dipeptide**.

Dipeptides can also be formed by the condensation of two different amino acids. In this case two different molecules can be formed:



Since the resulting dipeptides also have both amine groups and carboxylic acid groups, they can undergo further condensation reactions, eventually forming polymers:



This reaction is carried out alongside DNA molecules in the bodies of living organisms. The DNA lines up the amino acid molecules in the correct order so that the condensation reactions can take place. The resulting polymer is called a **protein**, and is an essential component of living organisms.