

# Peptides

**MSc.Issa Farhan / Optic techniques  
department / ALMUSTAQBAL  
university**

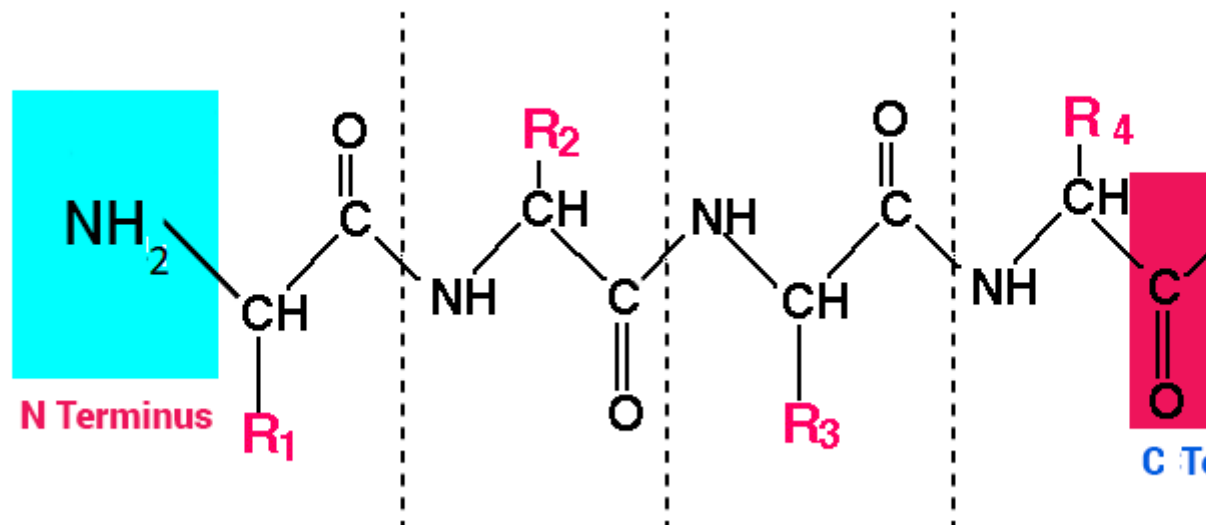
## What are Peptides?

Peptides are naturally occurring short chains of amino acid monomers connected by amide bonds.

In other words, any substance which resembles the molecular structure of smaller proteins. Peptides include many antibiotics, hormones and other substances that involve in the biological functions of liver.

Peptides are separated from proteins on the basis of size. Proteins are comprised of multiple polypeptides that are placed in a biologically functional way.

# PEPTIDES



There are many types of peptides; Di-peptide is the shortest peptide which consists of only two [amino acids](#) connected by one peptide bond. A polypeptide is a continuous long and single peptide chain. Therefore, it can be stated that peptides belong to a broad category of biological polymers and oligomers.

## Types & Classes of Peptides

These are categorized into several classes, based on their production type.

1. **Milk Peptides:** Formed when the digestive system breaks down a milk protein called Casein. They are also formed from proteinases arising from lactobacilli during the fermentation of milk.
2. **Peptones:** Peptones are produced during the proteolysis of animal milk or meat. Sometimes it also can be formed from vitamins, fats, metals and some salts. Peptones are useful in growing fungi and bacteria that are used in nutrient media.
3. **Ribosomal Peptides:** These are produced by translation (a process in which cellular ribosomes create proteins) of mRNA. To achieve a mature form, they are often subjected to proteolysis. Some organisms like microcins (small bacteria) produce peptides as antibiotics. However, these peptides undergo post-translational modifications like hydroxylation, phosphorylation, sulfonation and glycosylation.

4. **Non-ribosomal Peptides:** Non-ribosomal Peptides are comprised of enzymes that are unique to each peptide, instead of the ribosome. Glutathione is the most common non-ribosomal peptide. These peptides have highly complex structures and are often cyclic.
5. **Peptide Fragments:** The fragments of proteins that are used to quantify or identify the source of protein are referred to as Peptide fragments.

## Molecular Biology

They occupy a very important place in molecular biology for many reasons. The prime reason is that peptides help in the production of peptide antibodies in animals. These are used to create antibodies in mice or rabbits against the specific protein. Peptides are also used in the study of protein function, and structure and also used in [mass spectrometry](#). There are also Peptide hormones which are basically hormones with peptide molecules.

## Applications of Peptides

- **Anti-Ageing Creams:** Many anti-ageing creams contain different types of peptides. Most commonly used peptides are those that are obtained from ocean plants like sea jasmine, sea fennel and sea beet.
- **Anti-Microbial treatments:** Antimicrobial peptides play a key role in treating the skin that is affected by injury, sun damage or acne lesions. Also proves that these are effective in restricting even the drug-resistant bacteria giving way to an array of possibilities in medical applications.
- **Body Imaging:** Body scans work by sending dyes through the bloodstream that fluoresce when they come in contact with certain tissues. These imaging techniques can help doctors to detect life-threatening cancer at its early stages.
- **Aspartame:** The artificial sweetener with zero calories found in many diet foods is a synthesized peptide. Aspartame is produced in labs which is 200 times sweeter than sugar.

## 1. Are peptides proteins?

Peptides are smaller than proteins. Traditionally, peptides are classified as

molecules that consist of between 2 and 50 amino acids, whereas proteins are made up of 50 or more amino acids.

**2. What are natural peptides?**

Peptides are found in all living organisms, and play a key role in the biological activity of any sort. The peptides are biological molecules that occur naturally. Like proteins, peptides are naturally produced (synthesized) from transcriptions of a genetic code sequence, DNA.

**3. Do peptides have isoelectric points?**

The pH value at which the molecule bears no electric charge is the isoelectric point (pI). This principle is particularly important for zwitterionic molecules including amino acids, peptides, and proteins. For an amino acid, the isoelectric point is the amine and carboxyl group average pKa values.

**4. What are biologically active peptides?**

Bioactive peptides can be identified as specific portions of 2 to 20 amino acid proteins with beneficial biological effects, including antioxidant, anti-hypertensive, anti-adipogenic, antimicrobial and anti-inflammatory effects.

**5. What are milk peptides?**

Milk peptides are produced during the fermentation of milk from milk proteins by an enzymatic breakdown by digestive enzymes or by lactobacilli proteinases.