

# Proteins in saliva

Saliva, as an initially clear liquid, is produced by the salivary glands . After mixing with the mixture of fluids in the oral cavity and adding cellular components, it becomes a cloudy liquid. It consists of 99% water, the remaining 1% consists of solid substances. These include electrolytes, small organic molecules, microorganisms and their products, cells lining the oral cavity, exogenous substances and, last but not least, proteins with different structures and functions.

The main sources of proteins are the salivary glands (200-300 proteins), plasma (part of the proteins are transferred to the saliva from the blood) and cells present in the saliva. The concentration of proteins in saliva is around **1-2 g/l** .

## Functions of salivary proteins

One of the most important functions is **food processing** , followed by a **protective** function ( salivary IgA ), **antimicrobial** action ( lactoferrin , lysozyme ) and the binding of calcium ions preventing the precipitation of calcium phosphate, the solution of which is supersaturated with saliva. Specific phosphoproteins, binding calcium cations, act as inhibitors of precipitation in the salivary glands.

According to the effects in saliva, we divide proteins into multifunctional and redundant. In the case of **multifunctionality** , the protein has several functions at the same time, and therefore there are different domains on it (e.g. a domain enabling binding to the tooth surface, a domain for binding to a microorganism). Conversely, if a protein is **redundant** , it provides the same function together with other proteins. Such are, for example, proteins with a protective function.

## Protein division

Proteins are most often divided in terms of their structure and appearance, and then by function - for example, proteins with enzyme activity (salivary  $\alpha$ -amylase , salivary lipase , peroxidase), calcium-binding proteins, etc.

### Division of proteins according to structure

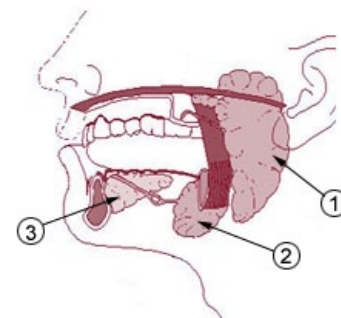
According to their structure, the proteins in saliva can be divided into mucinous and serous glycoproteins. **Mucinous** ones are characterized by a higher content of the carbohydrate component (more than 60%) and a higher molecular weight. We include mucins in this group. Other salivary proteins are **serous** , so they have a lower content of carbohydrates and a lower molecular weight.

### Division according to the occurrence of proteins

According to their occurrence, we divide salivary proteins into **specific** , occurring only in saliva ( histatins , acidic proteins rich in proline ), **non-specific** salivary proteins present in various body fluids ( lysozyme , mucins, immunoglobulins ) and proteins originating from other sources, e.g. from blood ( albumin ).

### Representation of proteins in saliva:

protein	volumetric quantity
Proline-rich acidic proteins	40%
Mucins	20%
$\alpha$ -amylase	20%
Cystatins	8%
Albumin	6%
Imunoglobulins	5%
Statherins	1%
Histatins	1%



1. Parotid Gland 2. Submandibular Gland 3. Sublingual Gland

## Links

## Related articles

- Saliva
- Salivary glands
- Goblet cell

## Source

- FIALOVÁ, Lenka. *Saliva* [lecture for subject Biochemistry and Pathobiochemistry, specialization Dentistry, 1. LF UK]. Praha. 15.10.2016.

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