

- Composition, function and regulation of salivary secretion

**Saliva:**

Extracellular fluid produced and secreted by salivary glands in the mouth.

In humans, saliva is 99.5% water plus electrolytes, mucus, white blood cells, epithelial cells, enzymes, antimicrobial agents.

**Composition of saliva:**

- Water
- Electrolytes:
  - Sodium
  - Potassium
  - Calcium
  - Magnesium
  - Chloride
  - Bicarbonate
  - Phosphate
  - Iodine
- Mucus:

Consists of mucopolysaccharides and glycoproteins
- Antibacterial compounds:
  - Thiocyanate
  - Hydrogen peroxide
- Secretory compound:
  - Immunoglobulin A
- Epidermal growth factor
- Enzymes:
  - Amylase
  - Lingual lipase
  - Kallikrein
  - Bradykinin
- Antimicrobial enzymes:
  - Lysozyme
  - Salivary lactoperoxidase
  - Lactoferrin
  - Immunoglobulin A

➤ Cells

➤ Opiorphin:

A pain killing substance found in human saliva

➤ Protein :

Hepatocorrin, a protein binds to vitamin B12 to protect it against degradation in stomach, before it binds to intrinsic factor.

**Saliva contains a Serous Secretion and a Mucous Secretion.**

- The serous secretion contains ptyalin (an  $\alpha$ -amylase), which is an enzyme for digesting starches.
- The mucous secretion contains mucin for lubrication and for surface protection.
- Saliva Contains High Concentrations of Potassium and Bicarbonate Ions and Low Concentrations of Sodium and Chloride Ions. Salivary secretion is a two-stage operation: The primary secretion from the acini contains ptyalin and/or mucin in a solution with an ionic composition similar to that of extracellular fluid.
- **The primary secretion is then modified in the ducts, as follows:** Sodium ions are actively reabsorbed and potassium ions are actively secreted into the ducts. An excess of sodium reabsorption creates a negative charge in the salivary ducts, causing chloride ions to be reabsorbed passively. • Bicarbonate ions are secreted into the ducts caused in part by exchange of bicarbonate for chloride ions but also by an active secretory process.

**Function of salivary secretion:**

Saliva contributes to;

- **Digestion of food**( moistening food and helping to create a food bolus, saliva allows food bolus to be passed easily from mouth into esophagus. It contains enzyme amylase which is capable of breaking down starch into simpler sugars such as maltose & dextrin that is further broken down in small intestine. Saliva also contains salivary lipase which plays a large role in fat digestion in new borns as their pancreatic lipase still needs some time to develop)
- **Maintenance of oral hygiene**

- **Act as a lubricant** (saliva coats the oral mucosa mechanically protecting it from trauma during eating, swallowing and speaking)
- **Role in taste**( saliva is liquid medium in which chemicals are carried to taste receptor cells)
- **Others** ( saliva maintains pH of mouth, salivary proteins prevent precipitation, act as buffer, saliva secretes carbonic anhydrase which plays a role in development of taste)
- **Regulation of salivary secretion:**
- **Salivation Is Controlled Mainly by Parasympathetic Nervous Signals**

The salivatory nuclei in the brain stem are excited by taste and tactile stimuli from the tongue, mouth, and pharynx. Salivation can also be affected by higher centers of the brain (e.g., salivation increases when a person smells favourite foods).