

Lecture 4

Saliva

Types and Composition

Dr. Sherif Almasry

2025



Saliva

Saliva is a clear watery biological fluid formed by salivary glands and secreted into the oral cavity.

➤ Types of saliva:

1. Serous saliva.
2. Mucous saliva.

1. Primary saliva.
2. Secondary saliva.
3. Oral saliva.

1. Resting saliva.
2. Stimulated saliva.

➤ Amount of secreted saliva /gland:

- **Submandibular glands secrete about 65%** of total saliva (mixed mainly serous).
- **Parotid glands secrete about 25%** of total saliva (serous).
- **Sublingual glands secrete about 5%** of total saliva (mixed mainly mucous).
- **Minor salivary glands secrete about 5%** of total saliva (mixed mainly mucous).

Physical properties of saliva

- **Appearance:** Clear and slightly opalescent fluid.
- **Color:** colorless or slightly bluish-white.
- **Viscosity:** watery in serous and slightly viscous in mucous.
- **Taste:** Slightly salty due to dissolved electrolytes.
- **Odor:** Odorless or bad odor in oral diseases.



- **PH:** Slightly acidic to neutral (average **6.8 – 7.2**) and increased in stimulated saliva.
- **Temperature:** The Same as body temperature (**37°C**).
- **Specific Gravity:** **1.002 – 1.012**.
- **Volume:** **1 – 1.5 Liters per day**.

Composition of saliva

<p>Water</p>	<p>99%</p>	<ul style="list-style-type: none"> • Acts as a solvent that dissolves food substances and electrolytes. • Allowing taste perception. • facilitating swallowing and speech.
<p>Inorganic Components Electrolyte</p>	<p>Na^+</p>	<ul style="list-style-type: none"> • Regulates osmotic pressure to maintains intracellular ionic balance.
	<p>K^+</p>	<ul style="list-style-type: none"> • Maintains intracellular ionic balance; higher concentration than in plasma.
	<p>Ca^{2+}</p>	<ul style="list-style-type: none"> • Important for tooth remineralization and maintenance of enamel integrity.
	<p>$(\text{PO}_4)^{3-}$</p>	<ul style="list-style-type: none"> • Acts as a buffering system and contributes to enamel remineralization.
	<p>HCO_3^-</p>	<ul style="list-style-type: none"> • Major buffering system; helps neutralize acids in the mouth.
	<p>Cl^-</p>	<ul style="list-style-type: none"> • Helps maintain osmotic equilibrium and activates salivary amylase.
	<p>F^-</p>	<ul style="list-style-type: none"> • Strengthens enamel and resists dental caries.

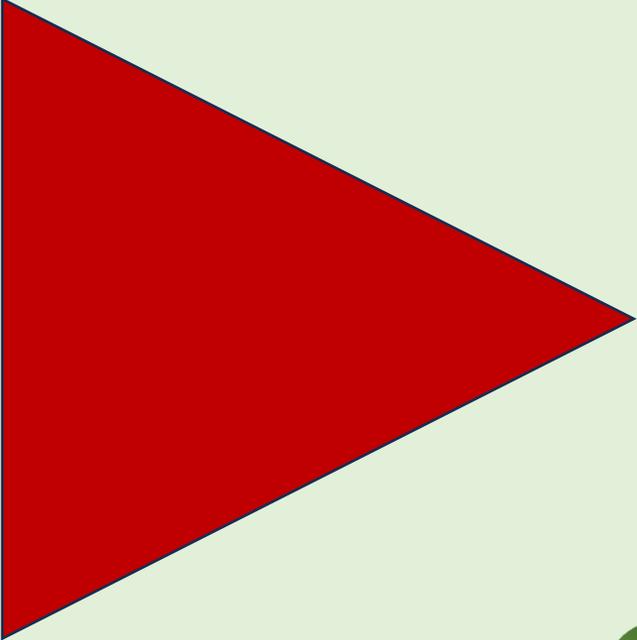
Organic Components of saliva

<p style="text-align: center;"> A Protein and glycoprotein </p>	Mucin	<ul style="list-style-type: none"> Lubricate oral tissues and protect oral mucosa.
	Proline = PRPs	<ul style="list-style-type: none"> Bind calcium to protect enamel. antimicrobial, and lubrication.
	Histidine HRP	<ul style="list-style-type: none"> Wound healing. Inhibit growth of fungi (candida). Antibacterial.
	Cystatins	<ul style="list-style-type: none"> Inhibit proteases enzymes produced by bacteria for reducing tissue damage.
	Statherin	<ul style="list-style-type: none"> maintaining tooth mineral balance to protect enamel from demineralization.
<p style="text-align: center;"> B Immunoglobulins </p>	IgA	<ul style="list-style-type: none"> Comes with salivary secretion in the duct system Prevent microbial growth. Prevent microbial adhesion to the oral tissue including enamel
	IgG and IgM	<ul style="list-style-type: none"> Smaller amount. IgG comes from gingival crevicular fluid. <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;"> <ul style="list-style-type: none"> Defense mechanism. Respond to infection. </div>

Organic Components of saliva

C Enzymes	α-Amylase (ptyalin)	<ul style="list-style-type: none">• Secreted mainly by parotid gland.• Begins the breakdown of starch into maltose and dextrin at PH of saliva.
	Lingual lipase	<ul style="list-style-type: none">• Secreted mainly by Von Ebner's glands.• Begin to digest triglycerides into Diglycerides and Free fatty acids.
	Lysozyme enzyme	<ul style="list-style-type: none">• Bactericidal which destroys the bacterial cell walls.
	Lactoferrin	<ul style="list-style-type: none">• Bacteriostatic, Binds iron for inhibiting bacterial growth.
	Peroxidase	<ul style="list-style-type: none">• Bacteriostatic which stop bacterial growth through H₂O₂.
D Carbohydrates		<ul style="list-style-type: none">• Mucopolysaccharide.• Glucose.

<p>E</p> <p>Cells</p>	<p>Anti-inflammatory cells</p>	<ul style="list-style-type: none"> • Lymphocyte comes from lingual tonsils. • Neutrophils comes from gingival crevicular fluid. • Macrophage.
	<p>Dead epithelial cells</p>	<ul style="list-style-type: none"> • Desquamated from the oral mucosa.
	<p>Microorganisms.</p>	<ul style="list-style-type: none"> • Bacteria and fungi in an equilibrium balance.
<p>F</p> <p>Others</p>		<ul style="list-style-type: none"> • Food remnants. • Uric acid and ammonia.



Thank you

my dear

students