



Biochemistry of biological fluids (BIOCH 472)

DR. MANSOUR GATASHEH

*Biochemistry Department, Science College
King Saud University*

Class 12:

Saliva

Objectives for this lecture

- State the functions of

Physiology of Saliva Gland

- *salivary*, is a part of glands that are stimulated by the **parasympathetic** nervous system, resulting in watery secretion.
- appetizing **food** or food in the mouth **initiates** signals from the nose and mouth to the salivatory nuclei of the brain.
- A signals by parasympathetic nerves send to the secretory glands, causing secretion of digestive juices before food enters the mouth.

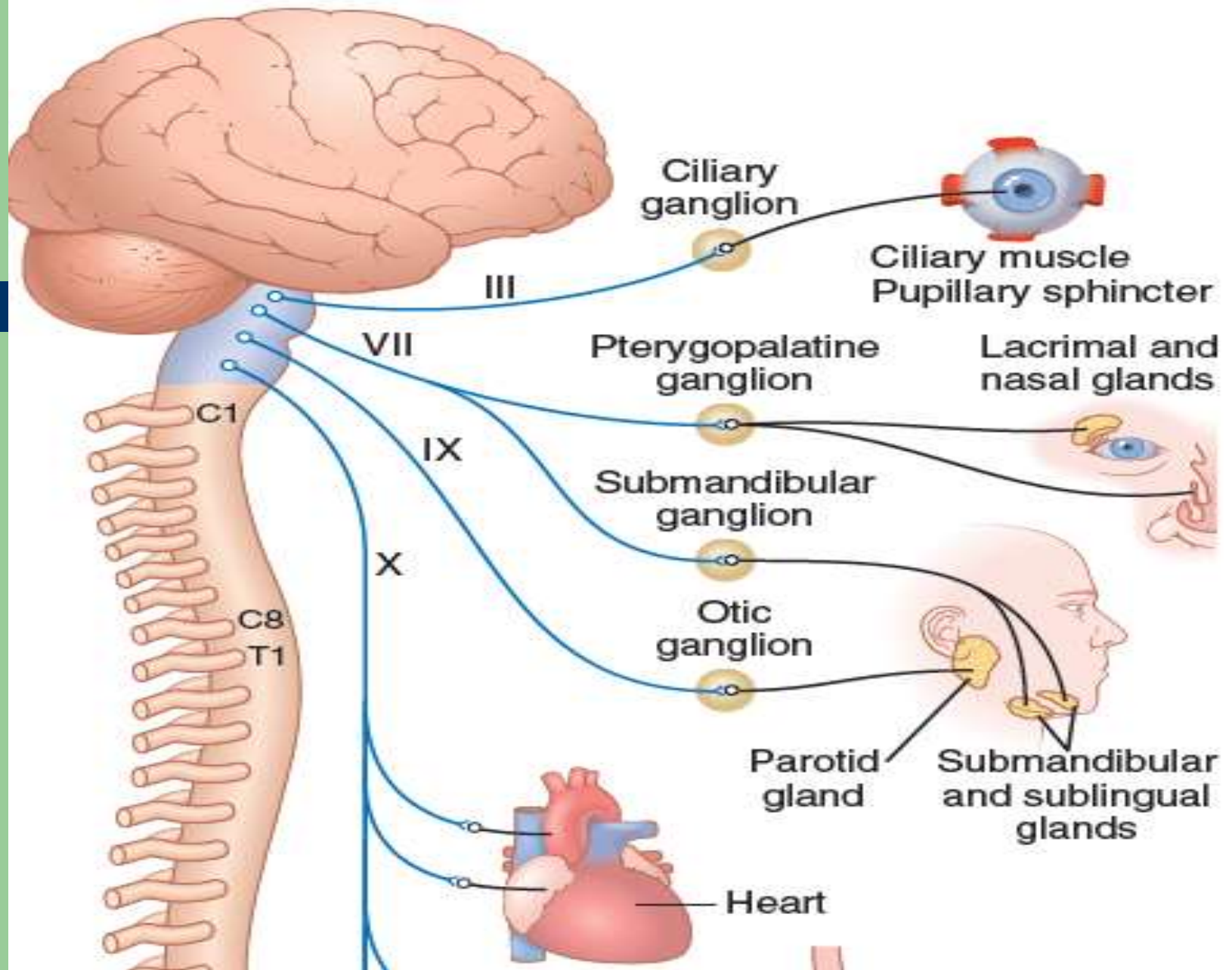
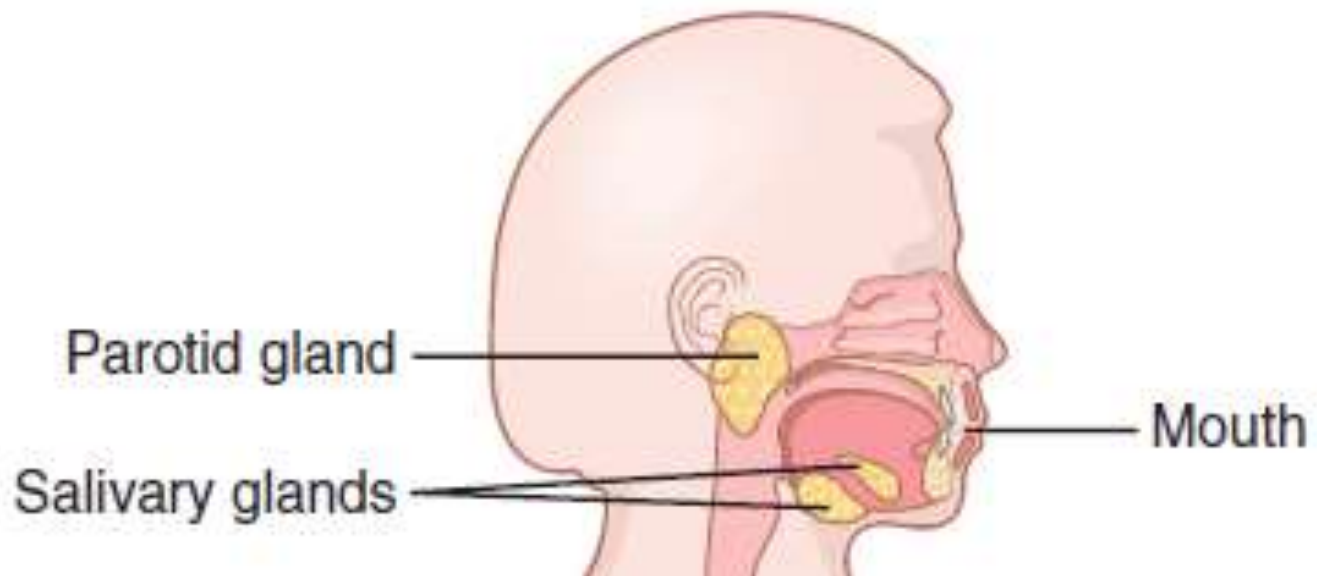


Figure 61-3. The parasympathetic nervous system.

- **hypothalamic** centers control body **temperature**, by increasing or decreasing salivation.



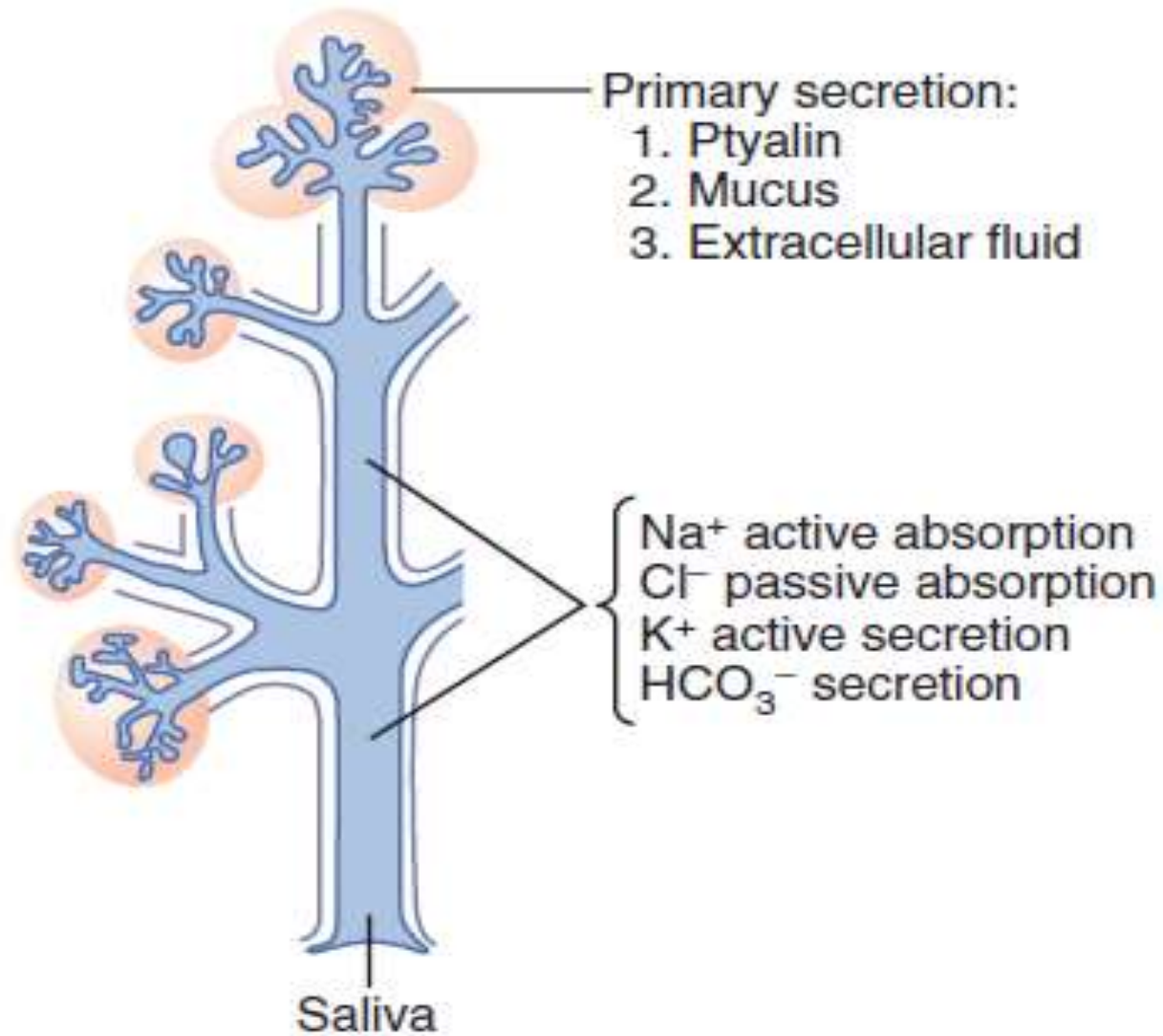


Figure 65-2. Formation and secretion of saliva by a submandibular salivary gland.

SECRETION OF SALIVA

- Daily secretion is 800 and 1500 mL.
- 0.5 mL/min of the mucous type is secreted.
- Has a pH between 6.0 and 7.0.
- Contain:
 - water
 - electrolytes (K, HCO₃, Na, Cl)
 - *ptyalin* (α -amylase)
 - *lingual lipase*
 - *mucin* (lubricate, surface protect)

- In the salivary ducts:
 - ✓ *Na* is actively **reabsorbed** (2/3 as in plasma)
 - ✓ *K* is actively **secreted** (4 time as in plasma)
- Therefore, the sodium ion concentration of the saliva is reduced.

Function of Saliva

1. Wash away pathogenic bacteria, and food particles that provide their metabolic support.
2. Contains *thiocyanate ions* and *proteolytic enzymes (lysozyme)* that destroy bacteria.
3. Contains *antibodies (IgA)* that destroy oral bacteria that cause dental caries.
4. Digestion of Carbohydrates by α -amylase (5%).
5. triglycerides is digested in stomach by *lipase* swallowed with the saliva (10%).

- **Aldosterone** increases the reabsorption of Na and Cl, and the secretion of K, by the effect on the sweat glands and the salivary glands in **hot environments**.

Pathogenesis

- Calculi are aggregates of solid chemicals (mineral salts) interlaid with a matrix of proteins and lipids, and found in any secreting gland.

Clinical investigation

- ***Hormone:***
- ✓ Salivary cortisol for Cushing's diagnosis and stress assessment.
- ✓ Saliva estradiol/progesterone for monitoring of menstrual cycles and fertility studies.
- ✓ Salivary testosterone for diagnosing male hypogonadism.
- ✓ Saliva testosterone is comparable to free plasma testosterone in women with PCOS.

Clinical investigation

- ***Amylase***: elevated with pancreatitis.
- ***drugs***: Alcohol value in the body.
Marijuana, Cocaine.