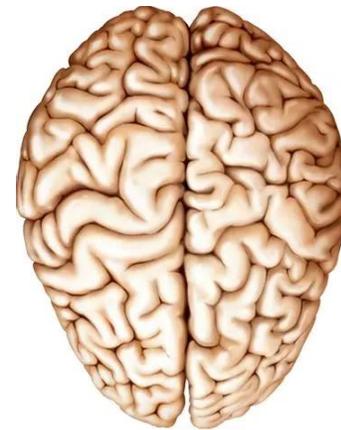


Lecture 6

Mechanism of Salivary Secretion

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2025



Mechanism of Salivary Secretion

Parotid Glands

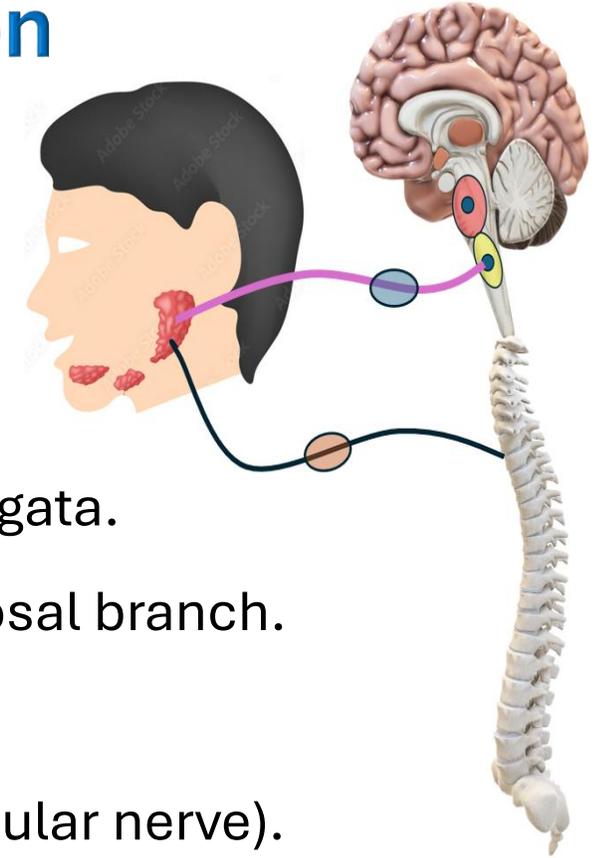
1. Parasympathetic Nerve Supply: (Secretomotor)

▪ Nerve pathway:

- a) **Origin inside the brain:** Inferior salivary nucleus in the medulla oblongata.
- b) **Preganglionic fibers:** Glossopharyngeal nerve (CN IX) via lesser petrosal branch.
- c) **Ganglion relay:** Otic ganglion (located just below the foramen oval).
- d) **Postganglionic fibers:** Auriculotemporal nerve (branch of the mandibular nerve).
- e) **Enter the parotid gland.**

▪ Reaction:

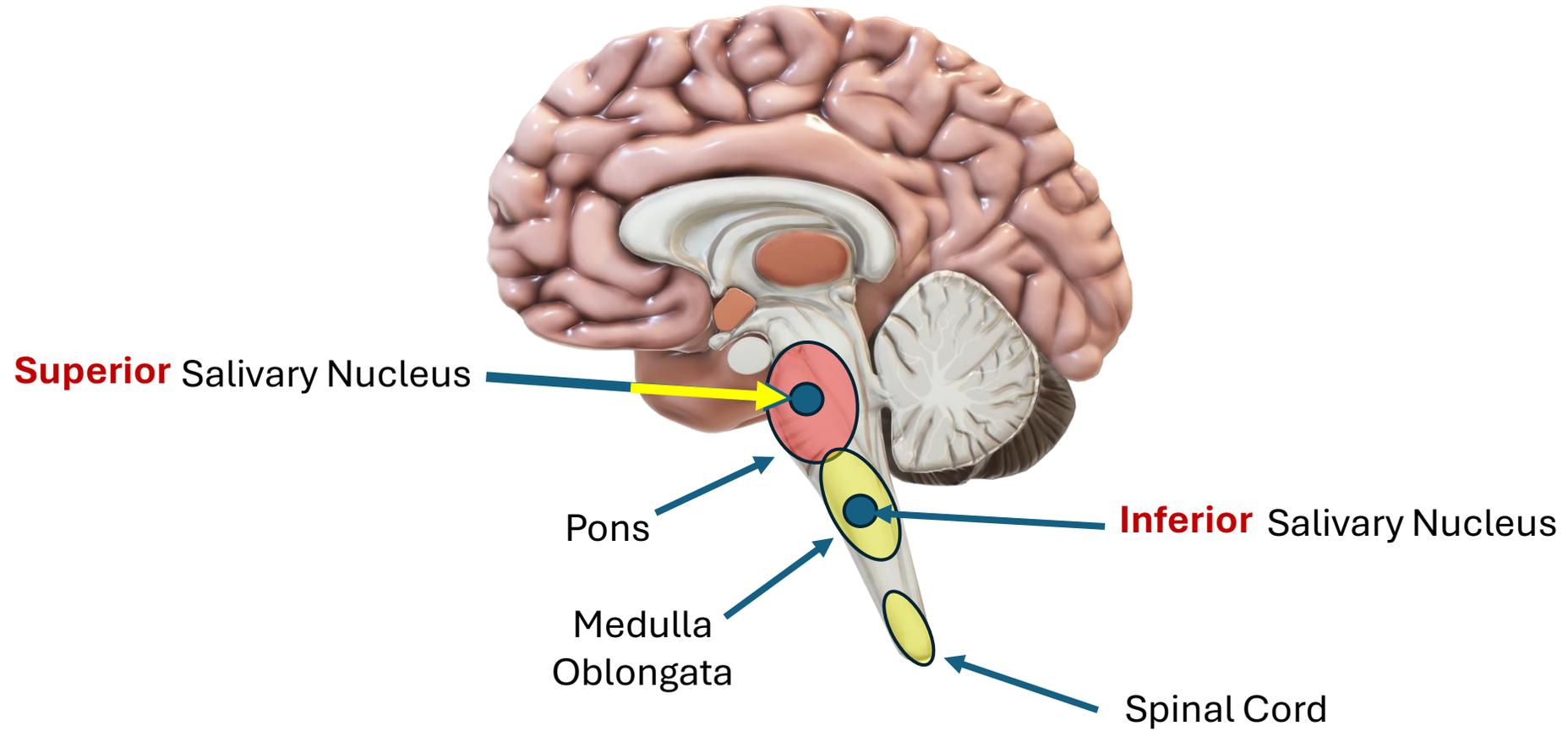
- Saliva is copious, watery, and rich enzymatic.
- Vasodilated blood vessels within the glands.



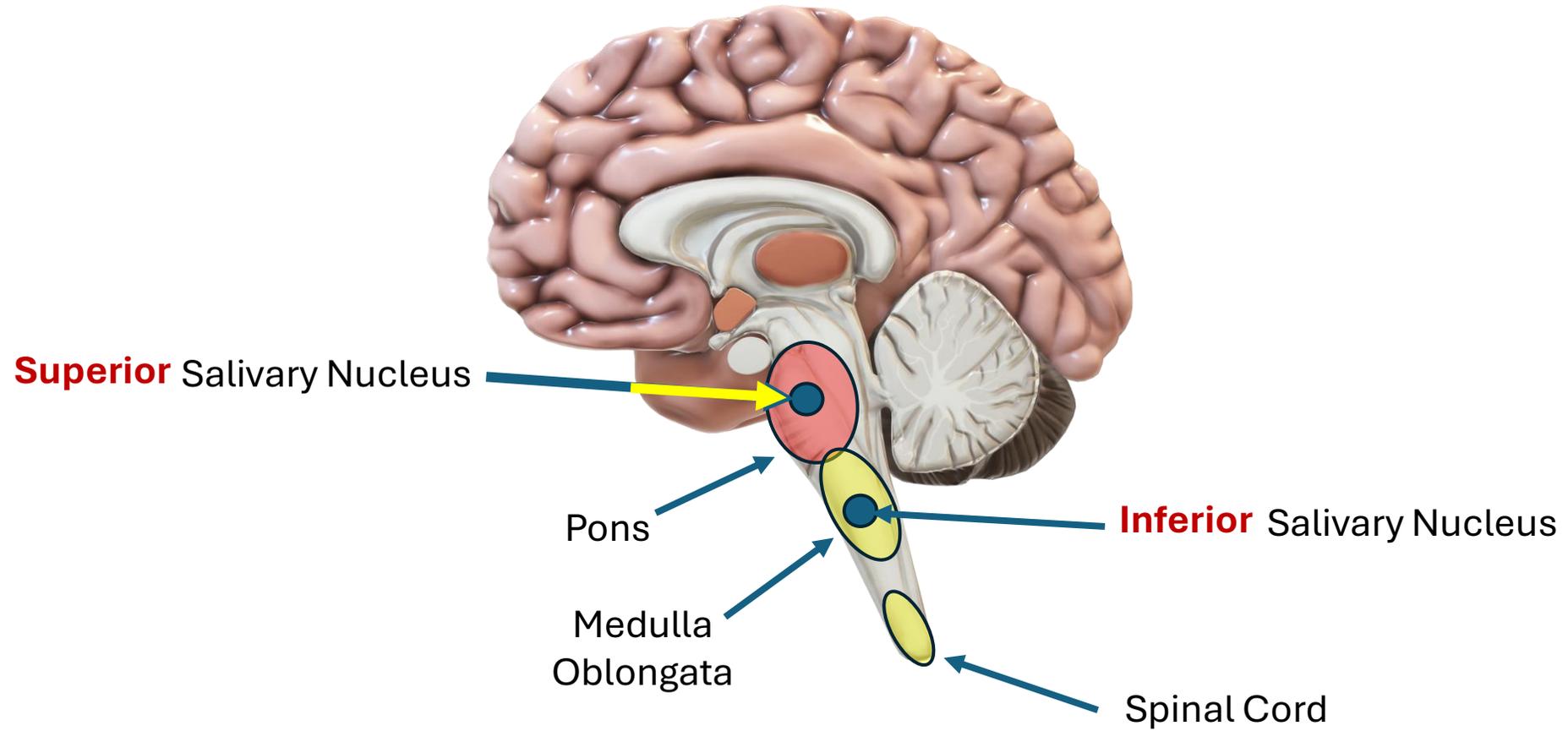




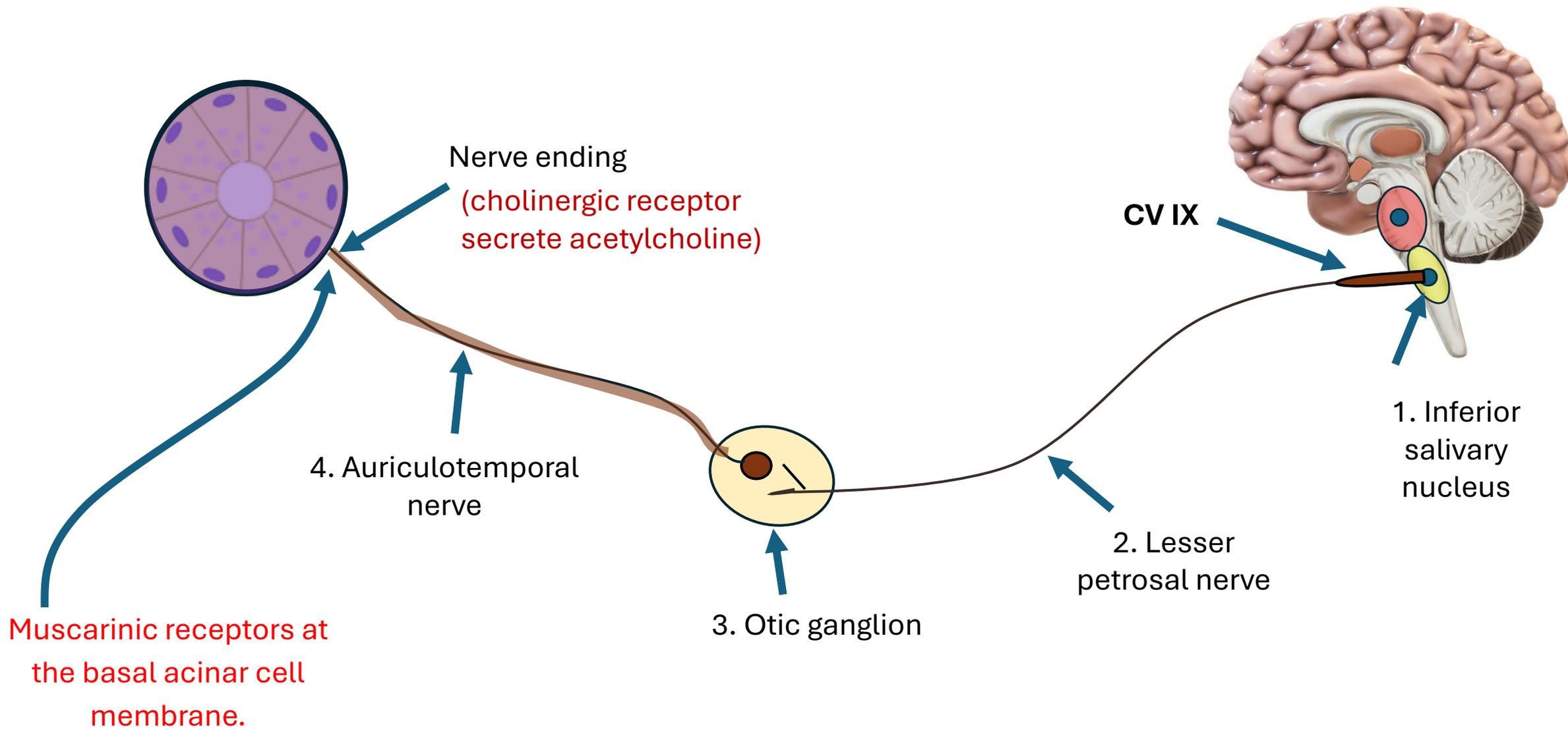
Structures of the Brain



Structures of the Brain



Parasympathetic pathway



Mechanism of Salivary Secretion

Parotid Glands

2. Sympathetic Nerve Supply: (Emergency)

- Nerve pathway:

- a) **Thoracic spinal cord:** Via (T1–T3).

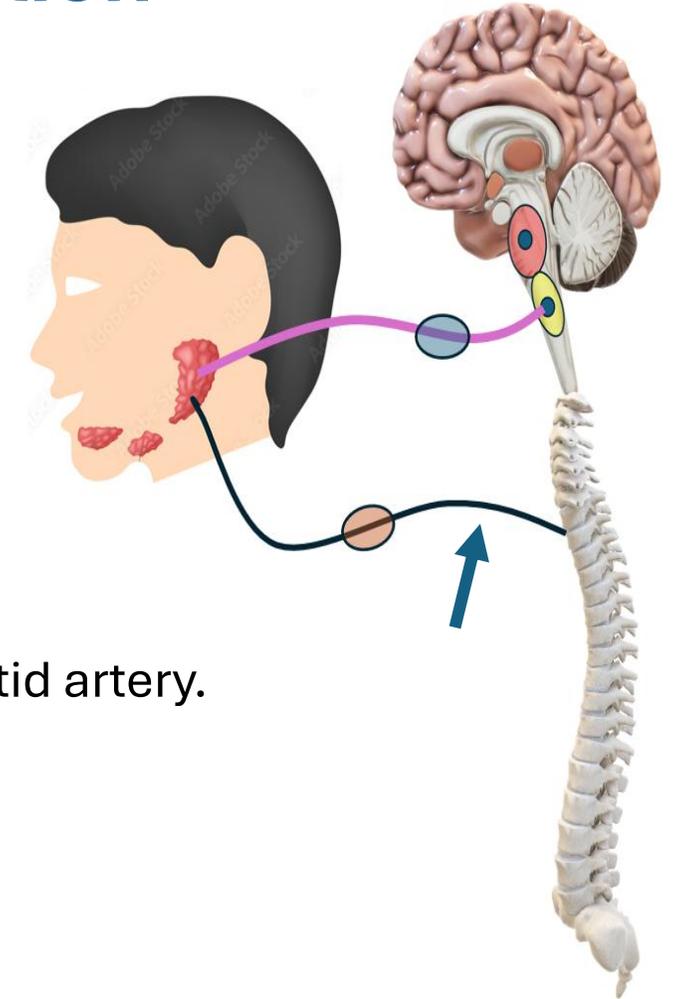
- b) **Ganglion relay:** Superior cervical ganglion.

- c) **Postganglionic fibers:** External carotid plexus around the external carotid artery.

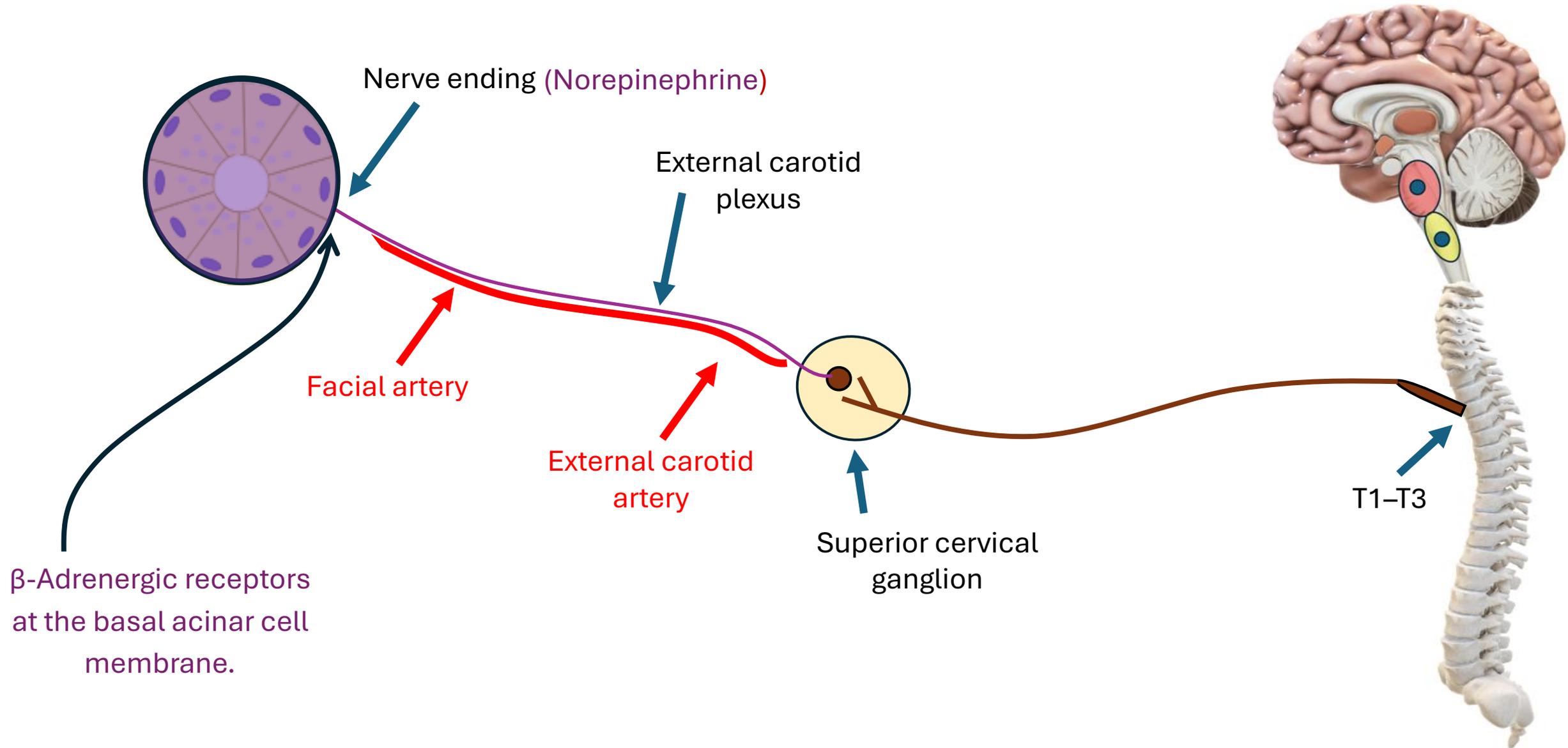
- d) **Enter the parotid gland.**

- Reaction:

- Reduced salivary secretion with only little mucous secretion.
 - Vasoconstricted blood vessels within the glands.



Sympathetic pathway



Submandibular and Sublingual Glands

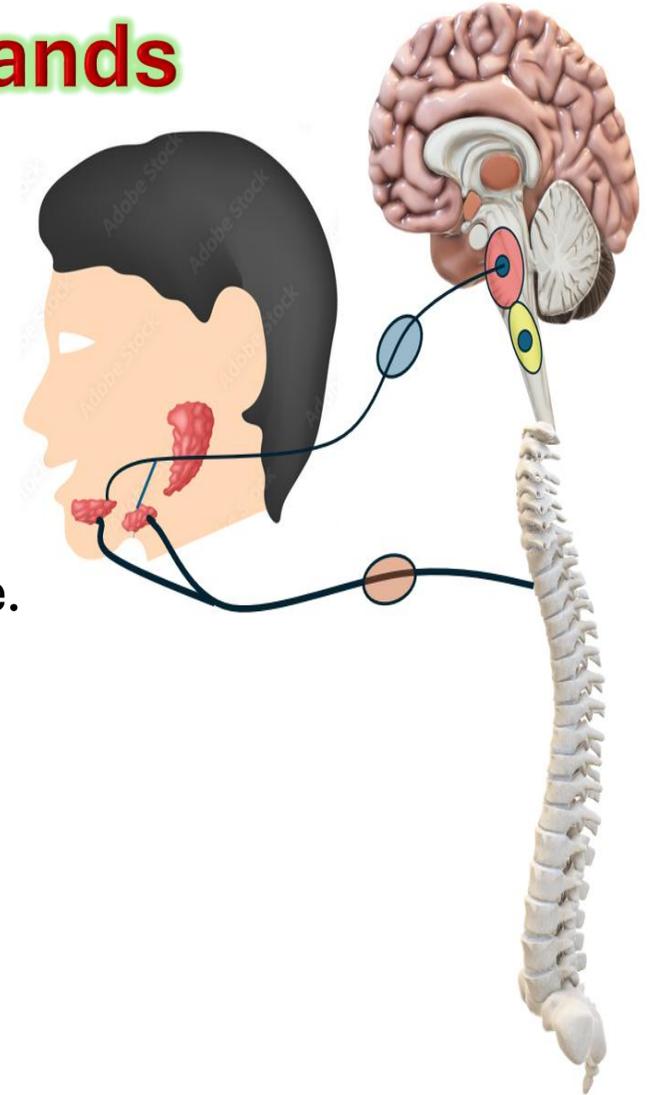
1. Parasympathetic Nerve Supply: (Secretomotor)

▪ Nerve pathway:

- a) **Origin inside the brain:** superior salivary nucleus in the pons.
- b) **Preganglionic fibers:** Facial nerve (CN VII) via chorda tympani nerve.
- c) **Ganglion relay:** Submandibular ganglion.
- d) **Postganglionic fibers:** Comes with lingual nerve.
- e) **Enter the submandibular and sublingual glands.**

▪ Reaction:

- Saliva is copious, watery, and rich enzymatic.
- Vasodilated blood vessels within the glands.



Parasympathetic pathway

Submandibular and sublingual glands

Nerve ending
(cholinergic receptor
secrete acetylcholine)

CV VII

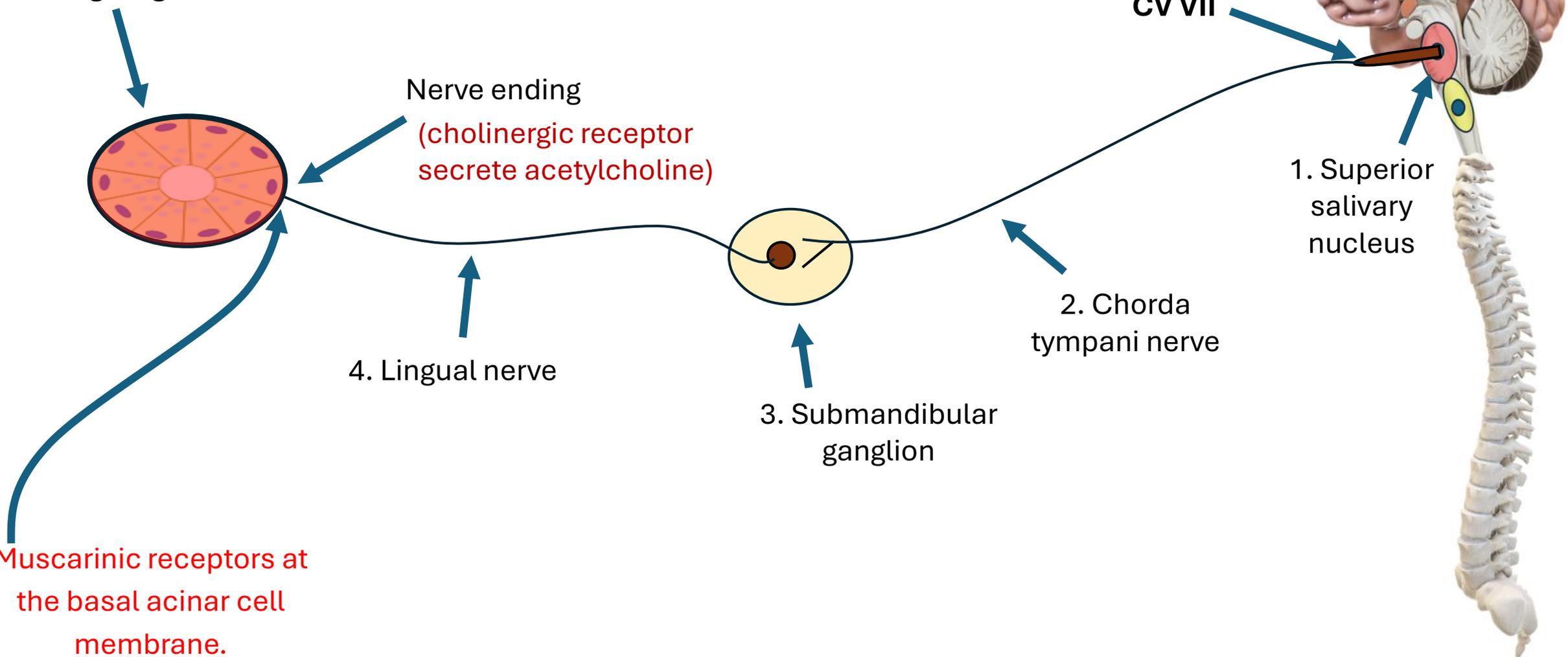
1. Superior
salivary
nucleus

2. Chorda
tympani nerve

3. Submandibular
ganglion

4. Lingual nerve

Muscarinic receptors at
the basal acinar cell
membrane.



Submandibular and Sublingual Glands

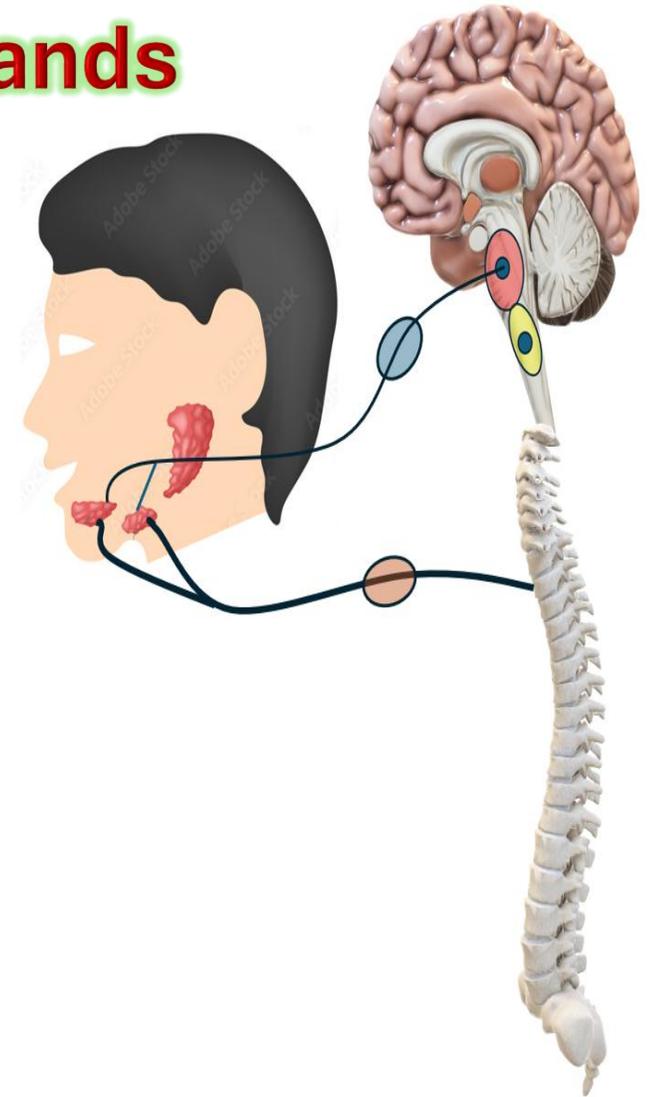
2. Sympathetic Nerve Supply: (Emergency)

▪ Nerve pathway:

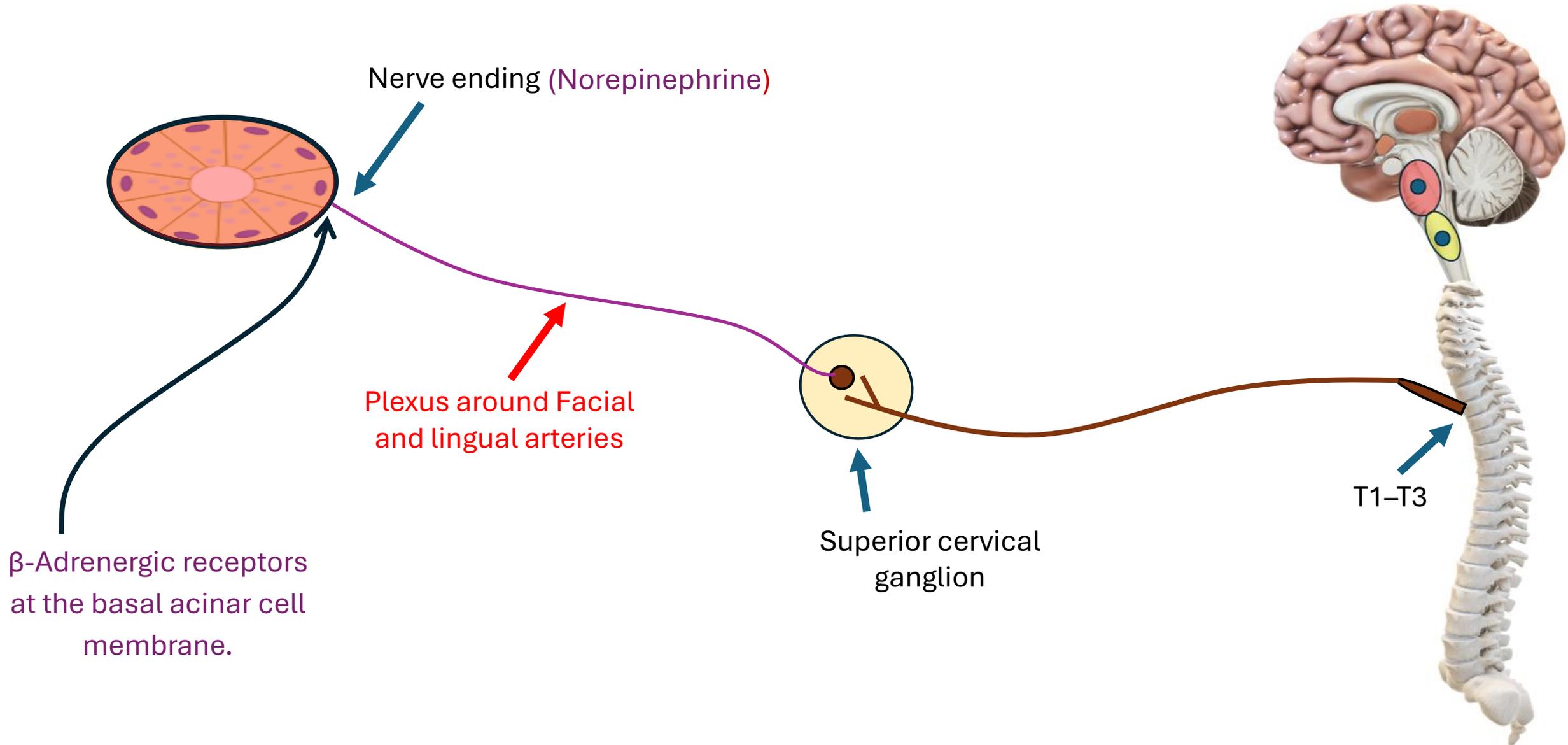
- a) **Thoracic spinal cord:** Via (T1–T3).
- b) **Ganglion relay:** Superior cervical ganglion.
- c) **Postganglionic fibers:** Postganglionic fibers form a plexus around the facial and lingual arteries.
- d) **Enter both glands.**

▪ Reaction:

- Reduced salivary secretion with only little mucous secretion.
- Vasoconstricted blood vessels within the glands.



Sympathetic pathway



Stages of saliva formation

- Saliva production occurs in two stages: first, the acini secrete the primary saliva, and second, as it flows through the ducts, its composition is modified.

Stage I (Acinar Secretion):

- ❖ **Location:** Acini (serous, mucous, or mixed).
- ❖ **Processes:**
 - a) Active transport of **Cl^- and HCO_3^- ions** into the lumen through the junctional complexes.
 - b) Passive transport of **Na^+ and water** through the junctional complexes.
 - c) Formation and secretion of **Proteins and enzymes** inside the acinar cells.
- ❖ **Result:** Isotonic, Primary Saliva.

Stage II (Ductal modification):

- ❖ **Location:** Duct system
- ❖ **Processes:**
 1. Reabsorption of Na^+ and Cl^- ions.
 2. Secretion of K^+ and HCO_3^- ions into the lumen.
- **Result:** Hypotonic, saliva comes to oral cavity.

أشكركم على اجتهادكم معي

وأراكم قريبا على خير

