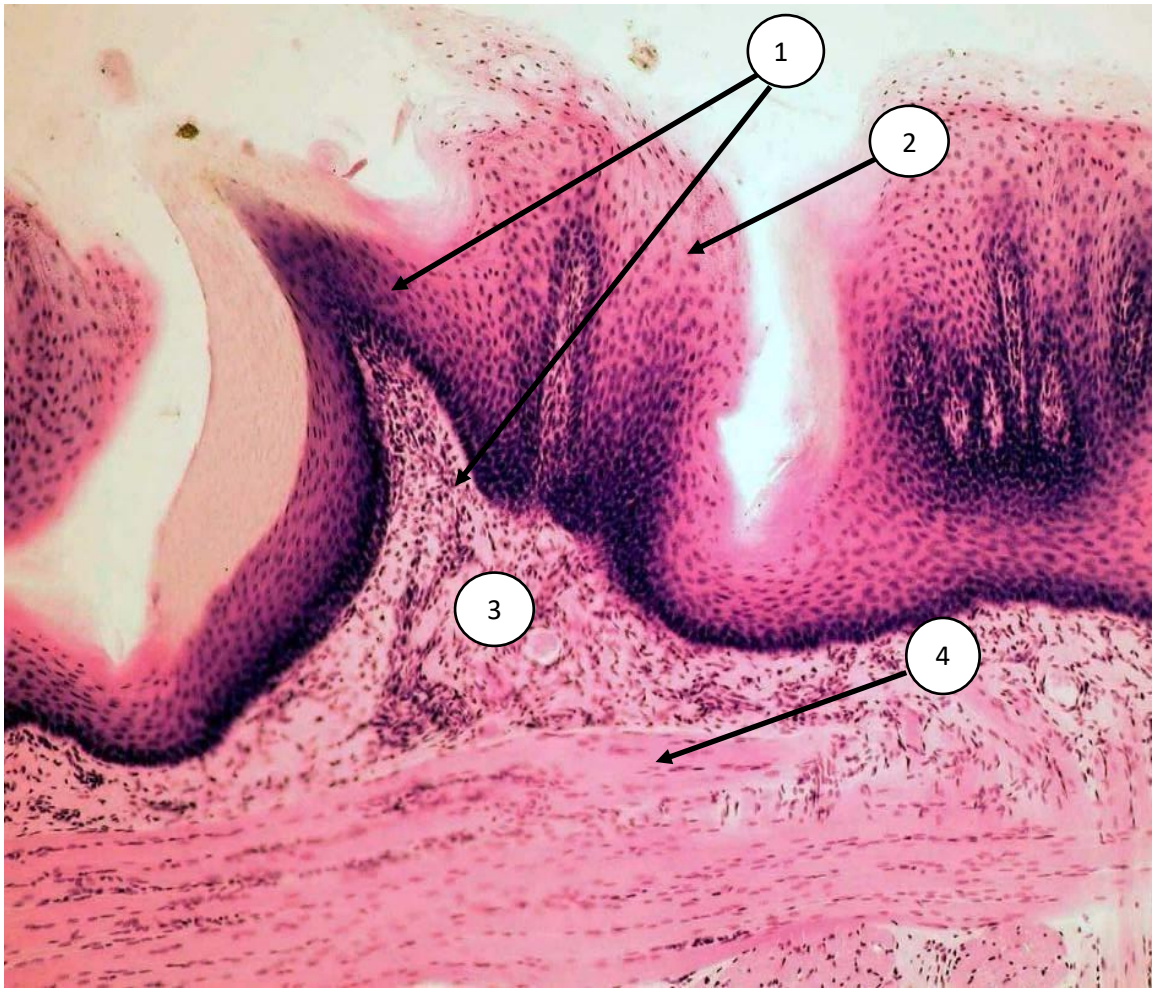
Topic 4. Characteristic of specialized oral mucosa. Development and structure of tongue.

Tongue		
Surfaces (parts)		**Structural features**
1.	**Superior surface**	is covered by specialized mucosa with numerous papillae. It includes a **stratified squamous keratinized epithelium (1 layer)** and **lamina propria (2 layer).** Mucosa is attached to the underlying skeletal muscle.
2.	**Inferior surface**	is covered by lining mucosa. It includes a **stratified squamous nonkeratinized epithelium (1 layer)**, **lamina propria (2 layer)** and **submucosa layer (3 layer)**.
3.	**Base of tongue**	Base containing striated muscle tissue. It is attached to the floor of the mouth.

The structure of the specialized mucosa of the tongue		
Types of papillae		**Structural features**
1.	**Filiform papillae**	1) **stratified squamous keratinized epithelium**, 2) **lamina propria** forms slender, cone-shaped papillae that go deep into the epithelium, 3) are the most numerous but smallest in size of the four types of papillae, 4) are often packed in rows and cover the entire superior surface of the **anterior two thirds** of the tongue (anterior to the sulcus terminalis), 5) have a central connective tissue core with several branches of small papillae, 6) are the only papillae that do not have taste buds, 7) their main functions are to help with chewing and mixing food.
2.	**Fungiform papillae**	1) **stratified squamous keratinized epithelium,** 2) **lamina propria** forms mushroom shaped papillae that go deep into the epithelium, 3) are much less numerous than the filiform papillae, 4) are taller than the filiform papillae, 5) each fungiform papilla has one to five taste buds on its superior surface. 6) **Types of taste:** sweet, sour, salty
3.	**Circumvallate**	1) **stratified squamous keratinized epithelium**,

	papillae (are arranged in a single row, which contains about 10 to 14 papillae that are located immediately anterior to the sulcus terminalis)	2) **lamina propria** forms cylindrical papillae in shape with groove, 3) each papillae is surrounded by a groove (moat), 4) ducts of the minor serous salivary glands (glands of von Ebner) open and drain serous products into the groove, 5) taste buds are located on the lateral walls of the groove. 6) **Types of taste:** bitter.
4.	**Foliate papillae**	1) **stratified squamous keratinized epithelium**, 2) **lamina propria** forms parallel ridges and furrows, 3) are located on the posterior lateral surface of the tongue and are poorly developed in adults, 4) taste buds are located at the lateral surface of papillae, 6) **Types of taste:** . sour and salty

The structure of the tongue		
Root of the tongue	Body of the tongue	Apex of the tongue



Filiform papillae of the tongue. Magnification X 40, hematoxylin-eosin staining.

On the preparation specialized oral mucosa of the tongue's dorsal surface there are filiform papillae (1). The papilla consists of a stratified squamous lightly keratinized epithelium (2). Under the epithelium there is lamina propria (3), which is loose connective tissue and forms the basis of the papilla. Under its lamina propria there are the skeletal muscle fibers (4). Filiform papillae do not contain taste buds.

VOCABULARY

The dorsal surface of the tongue and the lateral edges of the tongue are lined with mucous membrane, which contains nerve endings that perform the functions of general sensory perception and taste sense. The dorsal tongue surface is covered with tiny growths - papillae, which are not found on the ventral surface.

Filiform papillae - have the appearance of conical formations with a base of lamina propria coated with keratinized epithelium. They form a tough abrasive surface that is involved in compressing and breaking food when the tongue is opposed to the hard palate. In this way, the dorsal mucosa of the tongue functions as a masticatory mucosa.

Fungiform papillae - interspersed among the filiform papillae. They have wide smooth round apices and narrower bottoms. In young infants, the fungiform papillae can be seen with the bare eye as red dots on the back of the tongue (because the non-keratinized epithelium is relatively easy to see through). These papillae are less expressed in adults due to weak keratinization of the epithelium.

Foliate papillae - "leaf-shaped" papillae sometimes found on the lateral parts of the back of the tongue, although they are more frequently seen in mammals other than humans. These papillae consist of 4 to 11 parallel ridges that alternate with deep grooves in the mucosa, and a few taste buds are present in the epithelium of the lateral walls of the ridges.

Vallate (or circumvallate) papillae - adjacent and anterior to the sulcus terminalis are 8 to 12 circumvallate papillae, which are large papillae, each surrounded by a deep circular groove into which open the ducts of minor salivary glands, known as the glands of von Ebner. These papillae have a connective tissue core which is covered on the superior surface with a keratinized epithelium. The epithelium covering the lateral walls is nonkeratinized and contains taste buds.

Taste buds – are the chemoreceptors for the sense of taste. The taste buds are located in conjunction with the circumvallate papillae, fungiform papillae and leaf-like folds of the mucous membrane (folia linguae), which are located on the posterolateral part of the tongue. There are also taste buds on the posterior wall of the oropharynx, soft palate, epiglottis, and palatoglossal arches. Each taste bud consists of about 50 spindle-shaped cells, which according to the classification are divided into "light" (receptor), "dark" (supporting) and "basal" (stem) cells, based on their appearance. The unmyelinated nerves from cranial nerves VII, IX or X (depends on the location of the taste bud) form synapses with the receptor and, to certain extent, supporting cells of the taste bud.

Links:

https://histology.medicine.umich.edu/resources/oral-cavity

TESTS

1. A 53-year-old patient complained of **worsening of taste sensitivity**. During the examination, the doctor **observed atrophy of the mucous membrane** of certain areas of the oral cavity. Where are morphological changes most probably observed?

On the upper surface of the tongue
On the lower surface of the tongue
At the root of the tongue
On the hard palate
On the gums

2. During the examination of the patient's oral cavity, the dentist found that his **tongue was covered with whitish coatings**. What histological structures **are responsible for its formation**?

Epithelium of filiform papillae
Epithelium of foliate papillae
Epithelium of circumvallate papillae
Epithelium of fungiform papillae
Lingual tonsils

3. A 30-year-old patient visited a doctor with symptoms of fever up to thirty-eight degrees, weakness, and sore throat. On examination, it was found that the **patient's tongue is covered with a white bloom**. **What histological structures of the tongue are involved in the formation of the coating**?

Filiform papillae
Foliate papillae
Fungiform papillae
Circumvalate papillae
Connective tissue papillae of the tongue

4. In the preparation of the **tongue**, we see a **multilayered squamous nonkeratinized epithelium**, a well-developed basement mucosa and a **submucosal base through which the salivary gland excretory ducts pass**. What part of the tongue do we examine?

Inferior

Superior

Lateralis

Taste

Tonsillaris

5. On the tongue slide, we see a simple **alveolar-tubular gland, which** is **rich in mucus and has features of irregular secretion.** Which part of the tongue with these ducts is damaged?

Radix of tongue

Corpus of the tongue

Superior surface around circumvallate papillae

Apex of tongue

Inferior surface

6. **Basal cell damage** has occurred **in the taste buds** of the mushroom-shaped papillae of the tongue. What changes will be observed after this?

Physiological preparation of the receptor and supporting cells stops

Close taste pores of the buds

Receptor cells taste buds lost

Disorder of the buds innervation

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7. The **taste buds of the tongue** are elongated and located in the thickness of the epithelium. They **consist of several types of cells**. **What type of cell regenerates** the supporting and sensitive cells of taste receptors?

Basal cells

Myoepithelial cells

Receptor cells

Taste cells

Secretory cells

8. **Which papillae of the baby's tongue irritate the mother's nipples**, facilitating breastfeeding?
Conical shape of tongue
Foliate papillae
Circumvallate
Fungiform
Filiform
9. A patient with **glossitis has a partial absence of papillae**. What **papillae are located on the sides of the tongue** in adults?
Foliate
Filiform
Conical shape
Fungiform
Circumvallate

10. A 3-year-old child has **lost the sense of taste due to a thermal burn of the lateral surface of the tongue**. What **cells** will be the source of functional **regeneration** of these taste buds?
Basal cells
Supporting cells
Sensory cells
Ito cells
Epithelial cells

Links:
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