

*Anatomy, physiology & pathology
of the auditory system & speech*



**STRUCTURE OF THE AUDITORY
SENSORY SYSTEM**



AUDITORY SENSORY SYSTEM

consists of three main parts:

- peripheral
 - conductor
 - cortical
- РЕПОЗИТОРИЙ БГМУ



PERIPHERAL PART OF THE AUDITORY SENSORY SYSTEM

- external ear
 - middle ear
 - inner ear
- РЕЛОЗВИТОРІЙ БГІТ

STRUCTURE OF THE EXTERNAL EAR

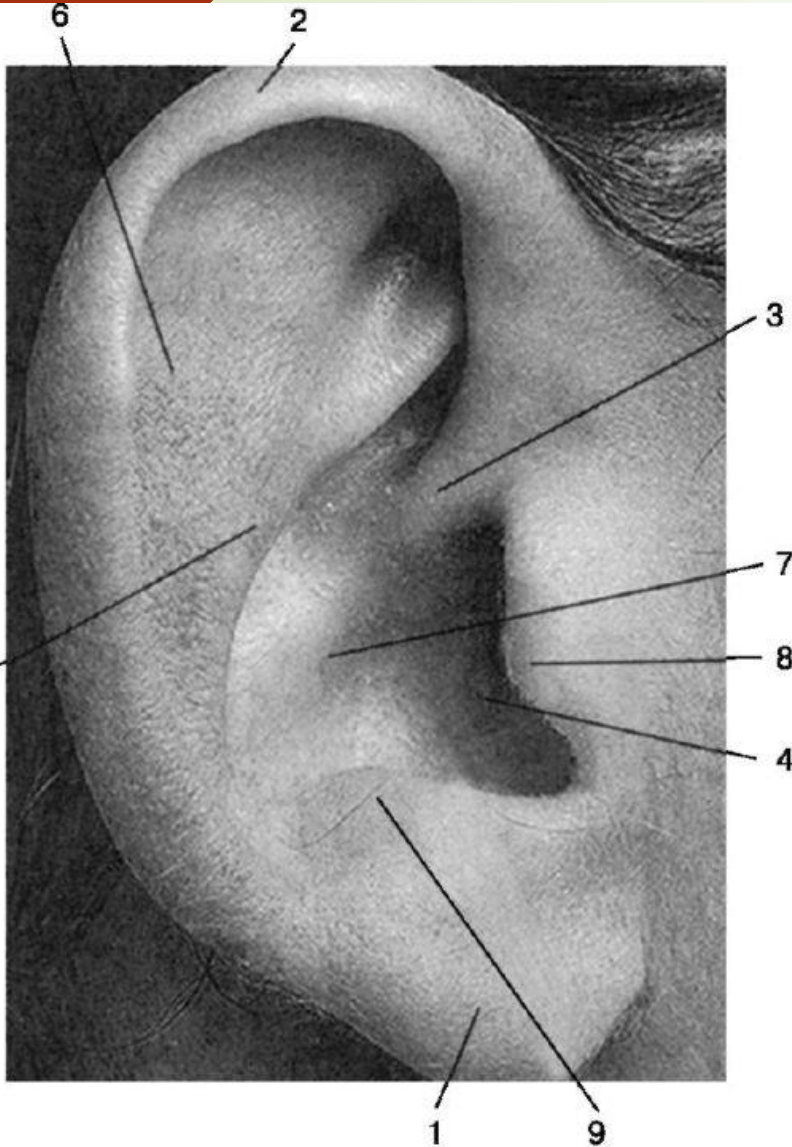
➔ auricle

(synonyms: *concha*, *earflap*, *pinna*)

➔ external auditory meatus

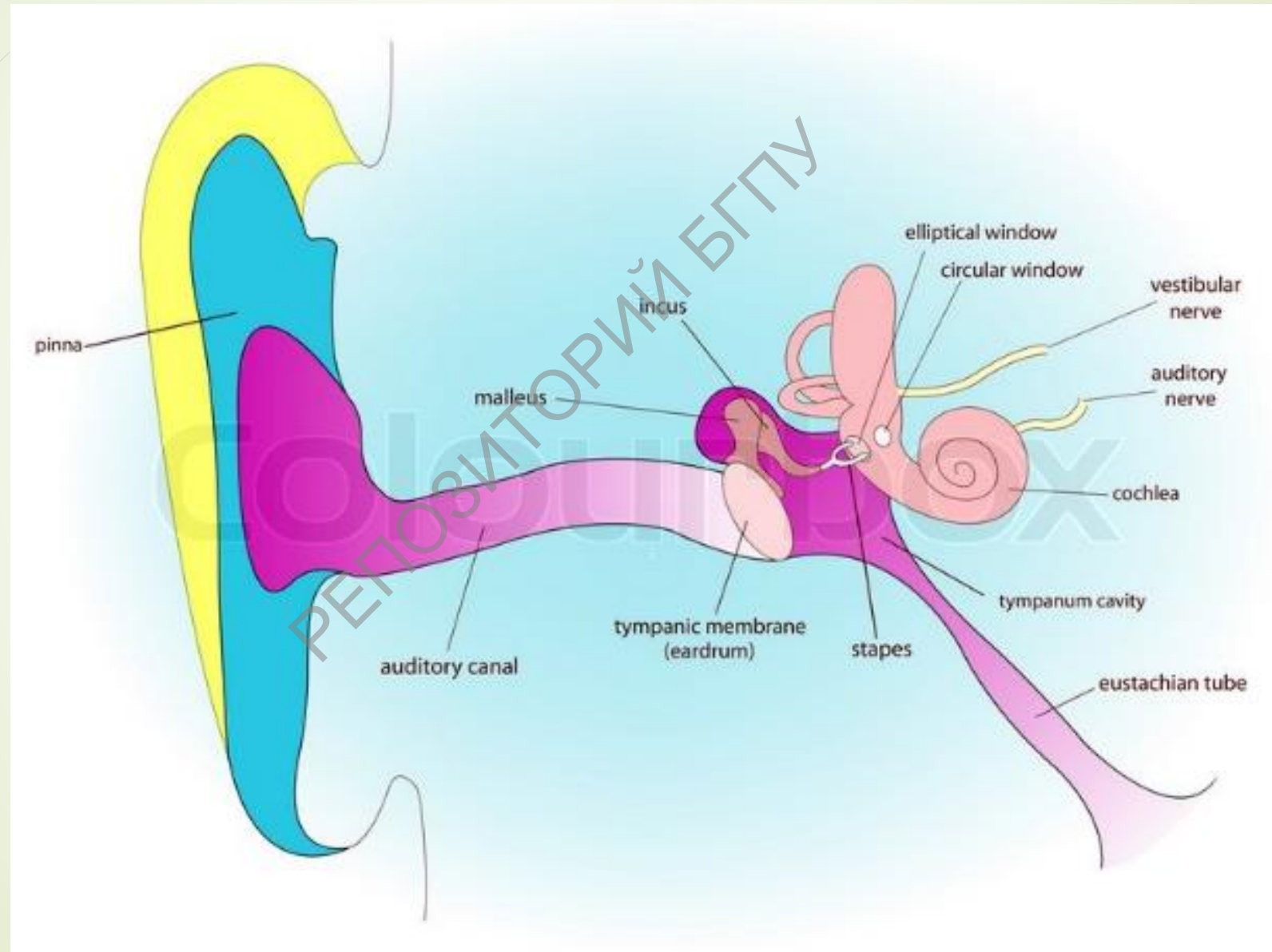
(synonyms: *ear canal*, *external ear opening*)

STRUCTURE OF THE AURICLE

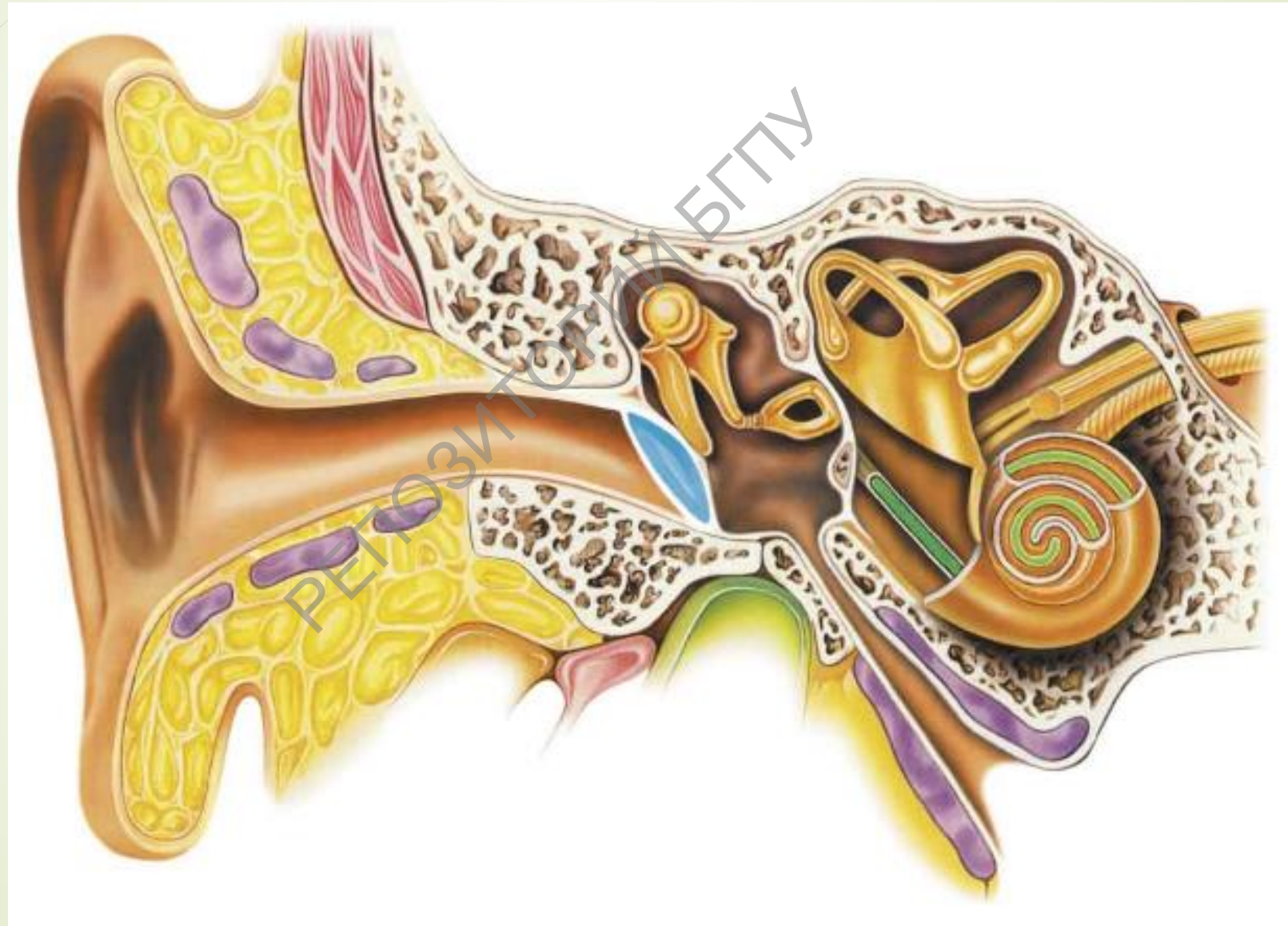


- 1 – earlobe
- 2 – helix
- 3 – crus helices
- 4 – external auditory meatus
- 5 – antihelix
- 6 – scaphoid fossa (scapha)
- 7 – cavity of concha
- 8 – tragus
- 9 – antitragus

SCHEMATIC STRUCTURE OF THE EAR (1)

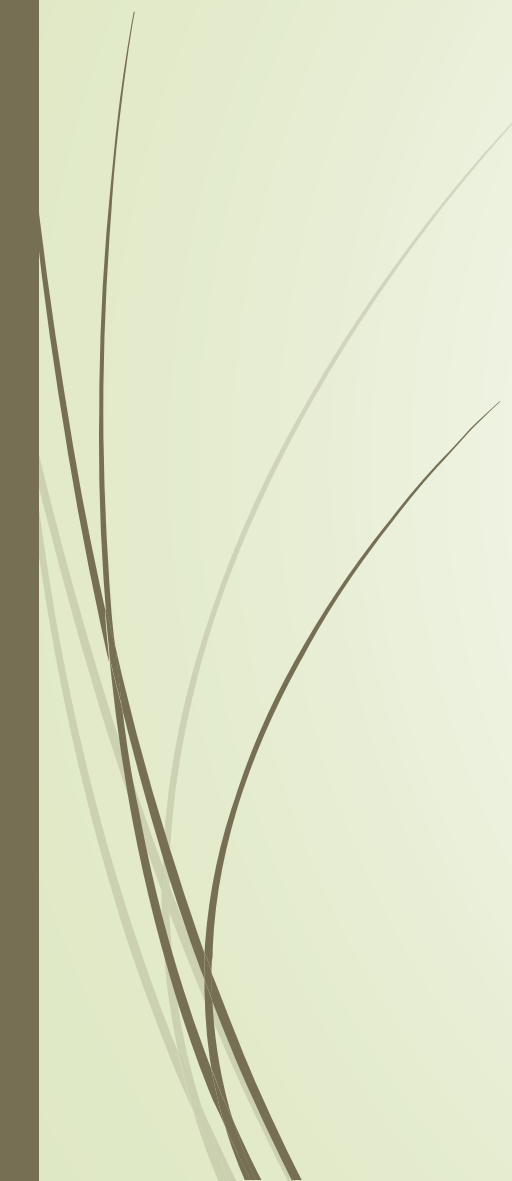


SCHEMATIC STRUCTURE OF THE EAR (2)

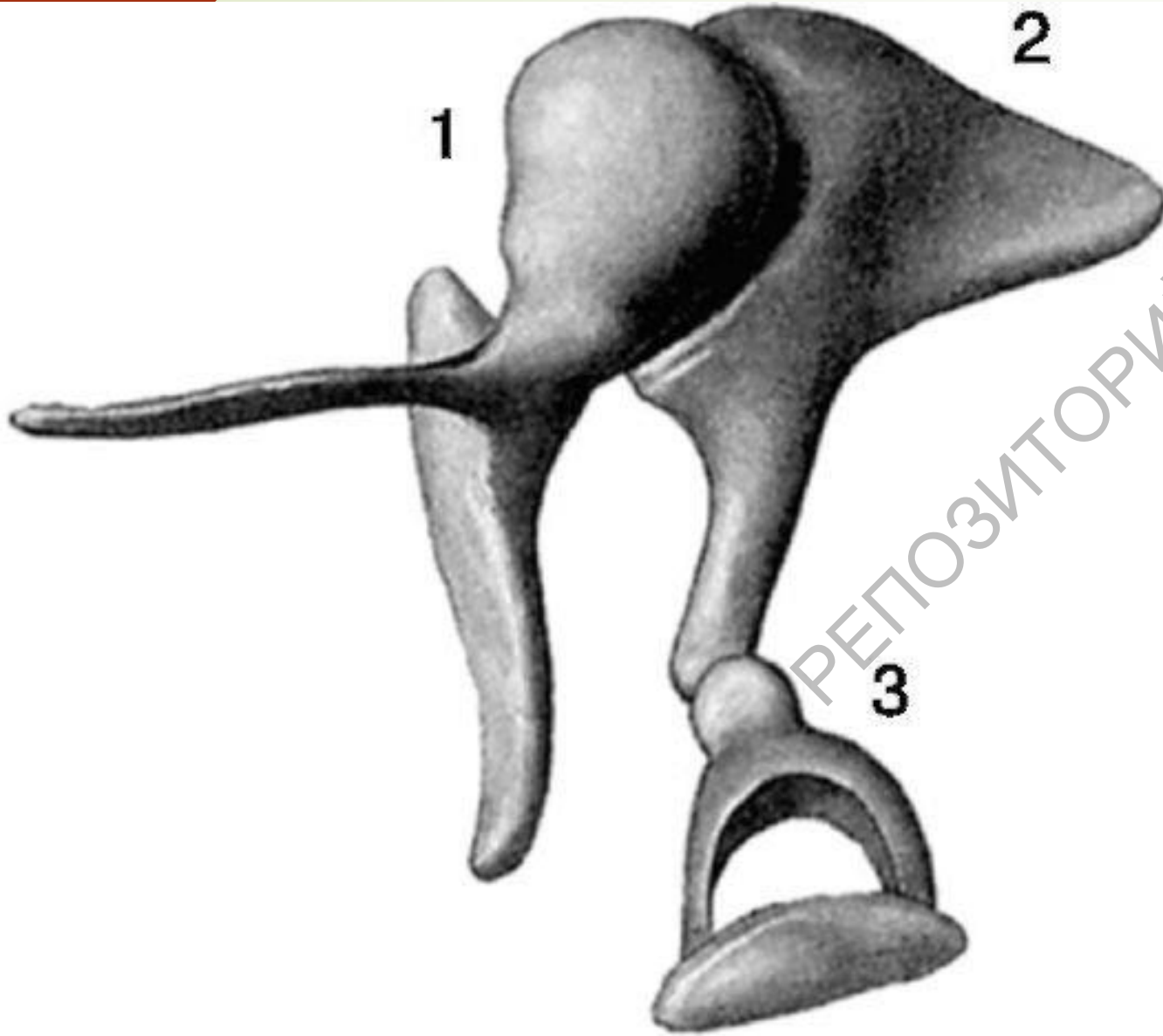




STRUCTURE OF THE MIDDLE EAR

- **tympanic cavity**
 - **auditory ossicles**
(malleus, incus, stapes)
 - **auditory muscles**
 - **eustachian (auditory) tube**
- 

AUDITORY OSSICLES



1 – malleus

2 – incus

3 – stapes

MUSCLES OF THE MIDDLE EAR

- **tensor muscle of tympanic membrane**
 - moves the ossicles inside
 - presses the stapes towards the oval window
- **stapedius muscle**
 - moves the ossicles against the oval window
 - controls the stapes mobility

FUNCTIONS OF MIDDLE EAR MUSCLES

- support the proper tonus of the tympanic membrane & auditory ossicles
- adjust the sound-conducting apparatus to tones differs in volume & pitch
- prevent the inner ear from excessively loud sounds

EUSTACHIAN (AUDITORY) TUBE

- connects the middle ear to the nasopharynx
- its walls are collapsed at rest and open while swallowing & yawn
- adult's eustachian tube is 2.5 cm long & 3 mm across
- consists of two parts:
 - bony (1/3 of the whole length)
 - membranous (2/3 of the whole length)

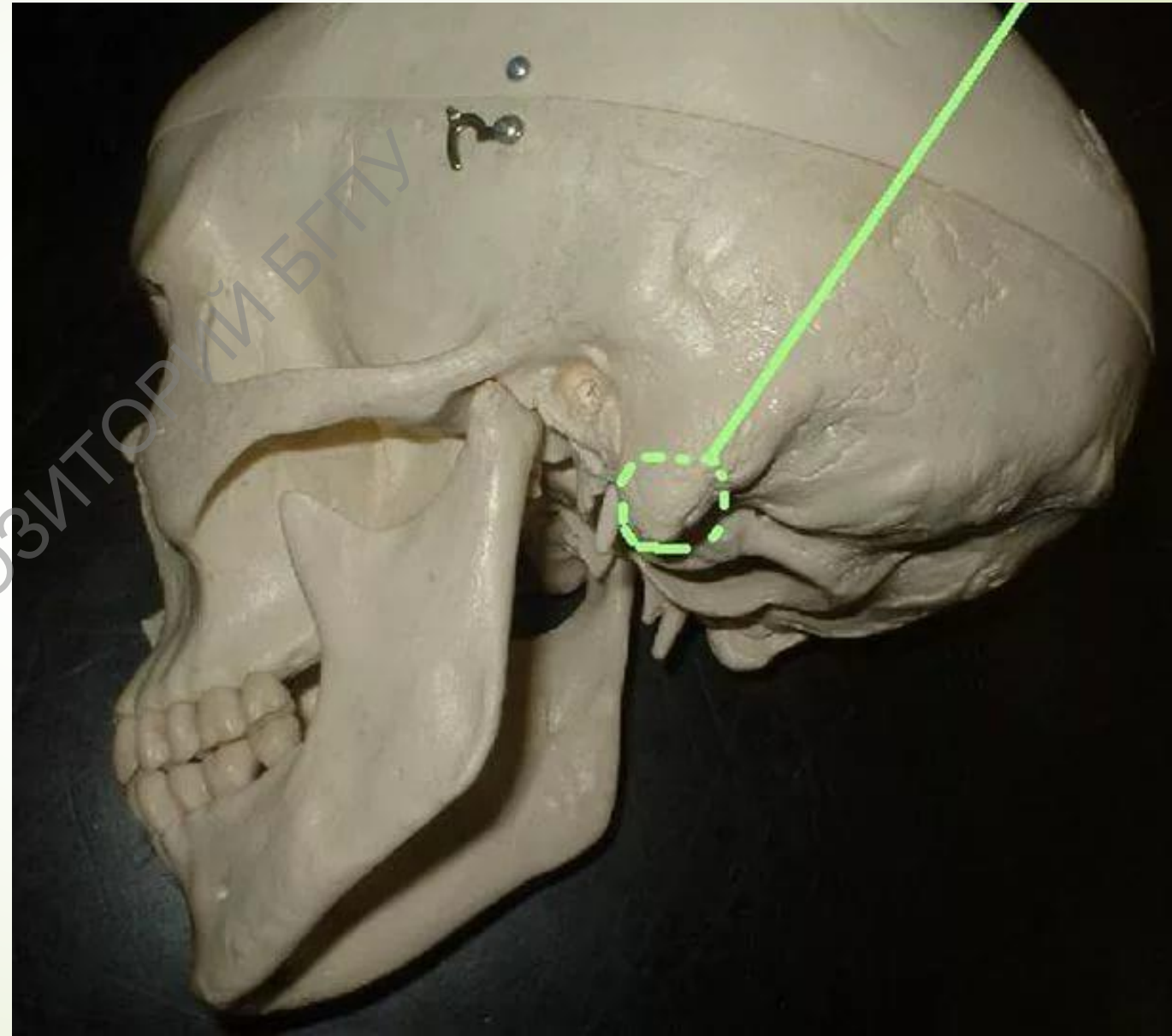
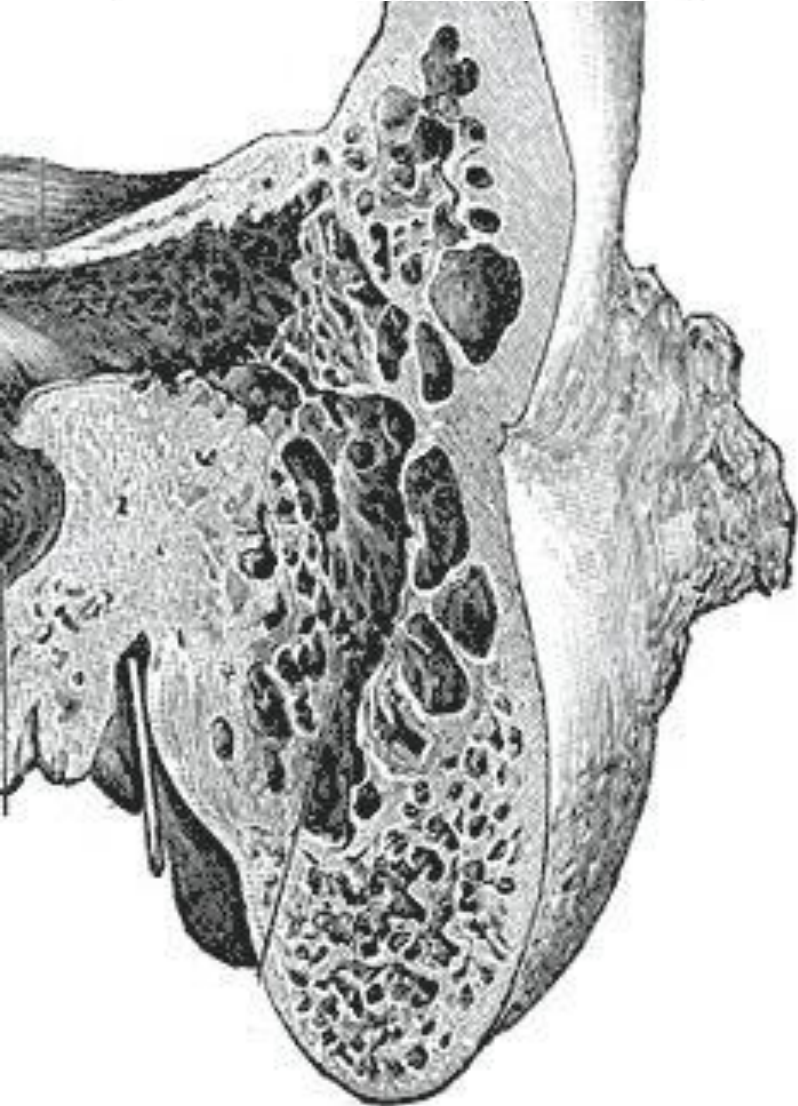
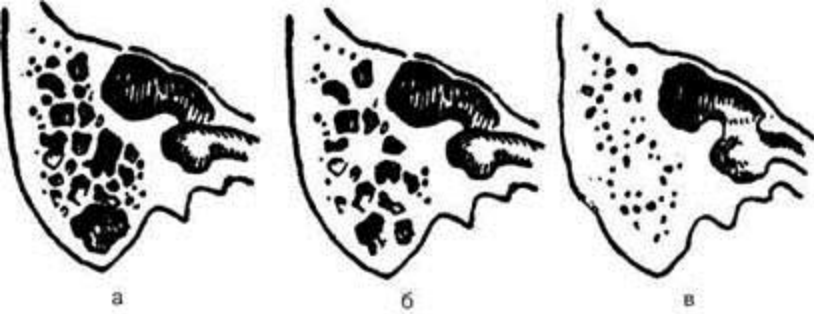
FUNCTIONS OF THE EUSTACHIAN TUBE

- **ventilation**
 - aligns pressure in the tympanic cavity with the atmospheric pressure
- **drainage**
 - inflammatory mucus & pus flow down through this tube from the tympanic cavity to the nasopharynx

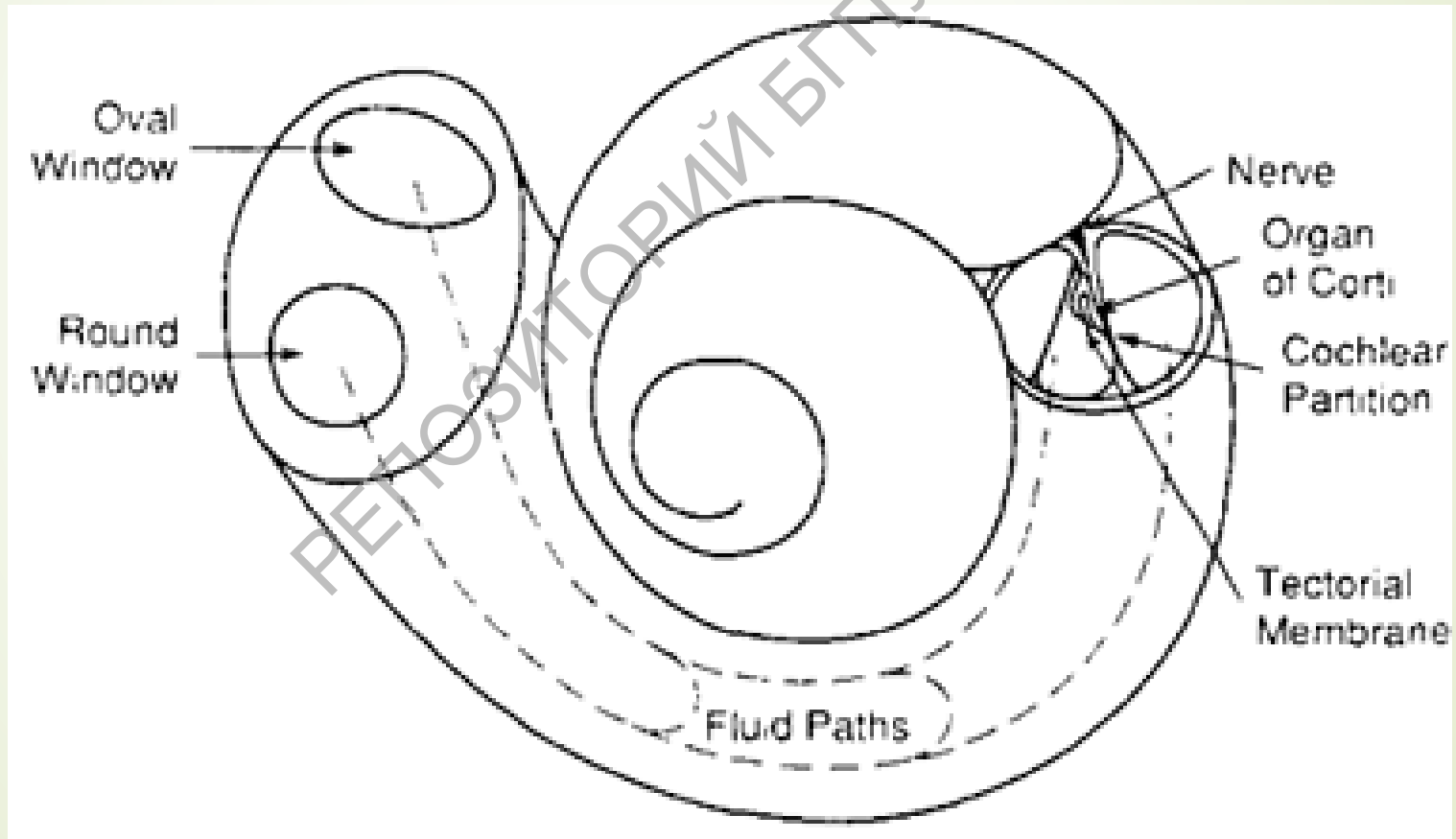
MASTOID BONE

- settles behind the auricle
- looks like the “aerated chocolate” in section
- consists of air cells, the biggest one is called “the antrum”
- the antrum is lined with mucous membrane & linked to the tympanic cavity
- infection could spread from the middle ear to the antrum (*mastoid disease*)

MASTOID BONE

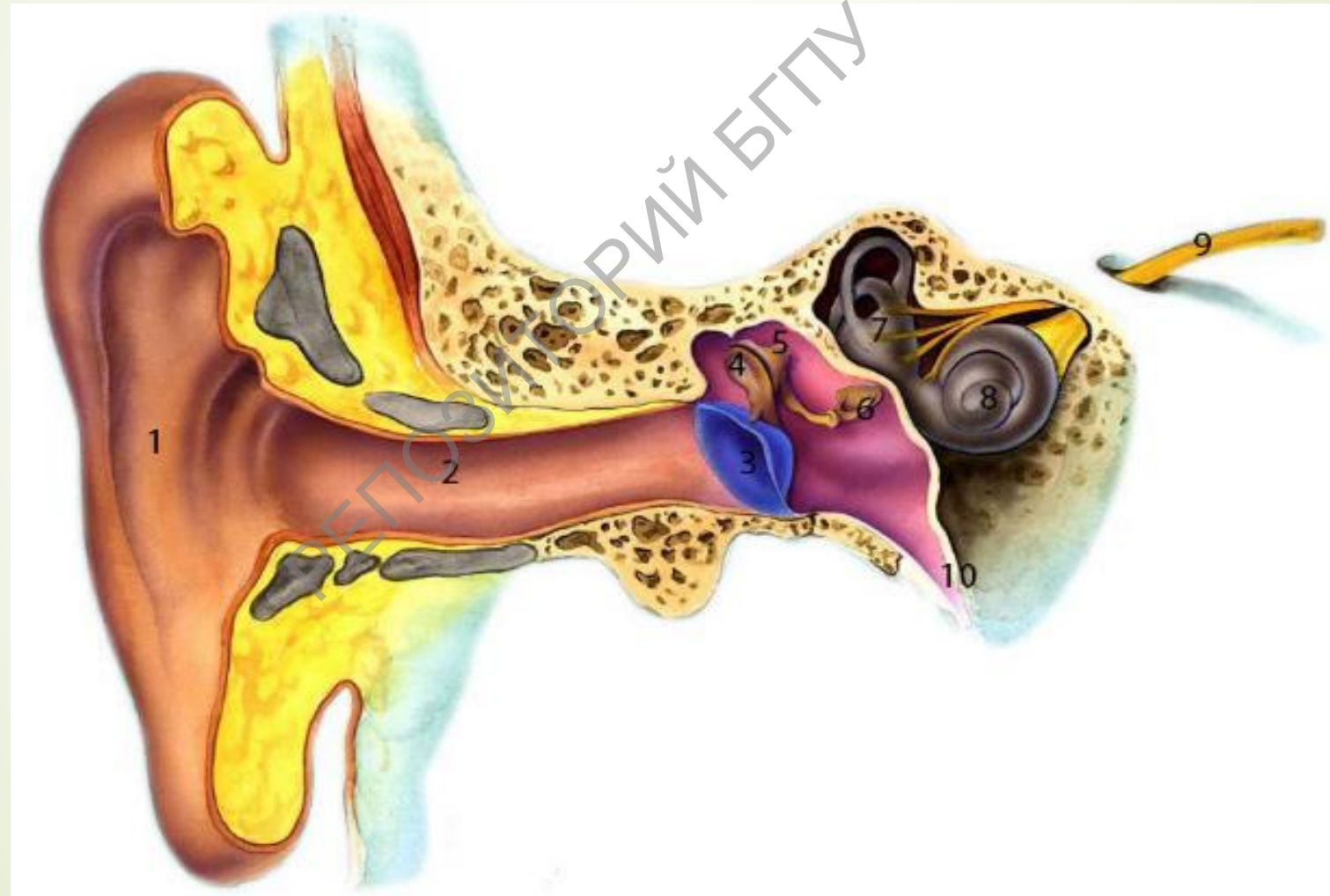


STRUCTURE OF THE COCHLEA



STRUCTURE OF THE EAR

test yourself (1)



STRUCTURE OF THE EAR

test yourself (2)

