

PNS-Biochemistry

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Lecture 1+2

Biochemistry of Vision

Corrected by:

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1. One of the following is NOT TRUE regarding the phototransduction process?

- a- The visual pigment is photobleached only in present of bright light
- b- The active rhodopsin contains all the trans retinal form of vitamin A
- c- The light should pass through the thickness of the retina to reach the photoreceptor cells
- d- Rhodopsin is GPCR with its ligand pre-bound
- e- In complete darkness, photoreceptor cells are depolarized and release inhibitory neurotransmitters

ANS: a

2. Color blindness is due to defect in?

- a-Rods
- b-Cones
- c-Rods and Cones
- d-Rhodopsin
- e-Aqueous humor

Ans: b
slide:10.

3. The rate limiting step involved in the visual pigment regeneration process is?

- a-The reduction of all trans retinal to all trans retinol
- b-The oxidation of 11-cis retinol to 11-cis retinal
- c-The esterification of all trans retinol to all trans retinyl ester
- d-The isomerization of all trans retinyl ester to 11-cis retinol
- e-The cleavage of the schiff base bond

Ans:d
slide:23.

4. In Rods, the cytoplasmic level of cGMP is high in absence of stimulus:

a-Due to dark current

b-Because the rate of synthesis of cGMP by phosphodiesterase enzyme is high

c-Due to the influx of Na⁺ ions

d-Because phosphodiesterase enzyme is switched off

e-Because guanylyl cyclase is inactive

Ans:d

5. The photobleached pigment is _____ ?

a. Rhodopsin

b. Iodopsin

c. Photopsin

d. Meta-rhodopsin II

e. 11-cis retinol

Ans: d
slide:22

6. 2nd messenger of phototransduction :

a. cyclic AMP

b. cyclic GMP

c. IP3

Ans: b.

7. How retina involved in the visual pathway?

a. Has the 1st and 2nd photoreceptors

8. Rods and cones are similar in :

a. activation of 11 cis retinol to retinal.

9. the cell that depolarized in resting state without stimulate photoreceptor cell ?

a. bipolar cell

10. visual adaptation mean :

a. time needed to adapt to new intensity

11. selective PDE4 inhibitor?

slide 20

12) All true about retinoic acid in target tissue except

A) appears to maintain normal skin health by switching on genes and differentiating keratinocytes (immature skin cells) into mature epidermal cells

B) activate osteoblasts and inhibit osteoclasts

C) RA plays a vital role during the spermatogenesis

D) Gene transcription and embryonic development

E) to maintain normal fertilization, implantation

Answer: B.

13) The major time consuming in ADAPTATION

A) Bleaching / regeneration of photopigments

B) Switch-over between rods and cones

C) modification Pupil size to adjust amount of light reaching the retina

Answer: A.

14) All about Discs in photoreceptors cell is true except

A) cones contain intra - inter disc space

B) Discs found in outer segments rather than inner segments

C) flat free disc in RODS

D) continuous membranous disc in CONES

Answer: A

15) All about Phototransduction is true except

- A) In light, c-GMP closes and the dark current stops - cis retinal to all-trans retinal
- B) In presence of light, a series of changes occur within rhodopsin which activate a downstream signaling cascade
- C) Resulting in the hyperpolarisation - convert from visual purple to photo-bleached
- D) When activated, PDE generates GMP from GTP

Answer: D

16) One of the following is not vitA:

- A. retinol
- B. retinal
- C. retinoic acid
- D. retinyl ester
- E. retinon

Answer: E

17) One of the following is wrong about rod and cones:

- A. rods more than cones 20 times
- B. cones centered in fovea centralis
- C. rods achromatic and cones trichromatic
- D. rods scotopic and cones photopic
- E. cones responsible for day vision because they are very light sensitive

ANS: E.

18) Dark current:

- A. cGMP-gated Na^+ channel: influx of Na^+
- B. cGMP-gated Na^+ channel: outflux of Na^+
- C. cAMP-gated Na^+ channel: influx of Na^+
- D. cAMP-gated Na^+ channel: outflux of Na^+

ANS: A

19) All of the following are preformed vit. A except?

Beta-carotene

20) Which of the following is correct regarding to Schiff base bond :

Dissociate immediately

الطب والجراحة

”كم يرجو الإنسان لو كان مليئاً بالعلم،
يَتَفَتَّقُ العلم من جوانبه وقلبه ولسانه،

حتى يكون العطاء بلا تعب، لكننا نؤمن أننا مأجورون على السعي، يعلم الله المحاولة، نُبَرِّدُ صدورنا أننا نَعْبُدُ رَبًّا
يَأْجُرُنَا على التَّفَاصِيلِ،

لذلك نُخَبِّئُ ما نرجوه سِرًّا، ونسعى إليه سِرًّا، ونلزم نَفْسَنَا كَأَنَّهُ كَلِّ ما نملك! ولا نقف!”

أ.قصي عاصم العسيلي

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Lecture 3

Biochemistry of Taste

1. One of the following is NOT TRUE regarding taste bud components:
- a. Taste receptor cells are modified neuroepithelial cells which are innervated by nerve fibers at the basal end.
 - b. Taste pore is close to the apical end of the taste receptor cells.
 - c. Basal cells are epithelial cells which migrate from adjacent tissue and replace old supporting cells every 10 days.
 - d. Microvilli contain ion channels or GPCR receptors.
 - e. Tastants are chemical compounds which can stimulate taste receptor cells through binding to specific receptors on the surface of microvilli.

Ans: c

2. Sweet taste is mediated by:
- a. cGMP response only
 - b. cAMP response only
 - c. IP3 response only
 - d. Both cAMP and IP3 responses
 - e. Both cAMP and cGMP responses

Ans: d

3. The second messenger which mediates the bitter taste is _____?

- a. cAMP
- b. cGMP
- c. IP3
- d. PIP2
- e. ATP

Ans: c

4. IP3 acts as a second messenger in:

- a. Both sweet and bitter tastes.
- b. Only sweet taste.
- c. Only bitter taste.
- d. Neither sweet nor bitter tastes.
- e. Umami taste only.

Ans: a

5. Which of the following is not associated with sour taste?

- a. G-protein
- b. Hydrogen ions (H⁺)
- c. Acid-sensing ion channels (ASICs)
- d. Direct ion channel activation
- e. pH changes

Ans: a

6. All of the following are true about taste buds and taste receptors except:

- a. Taste receptor cell is an elongated spindle cell that renews every 10 days.
- b. Basal cell renewal.
- c. Microvilli at the basal surface.
- d. Neuroepithelial cell with apical and basal surfaces.
- e. When depolarized, releases neurotransmitter.

Ans: c

7. All of the following about second messengers in various pathways are true except:

- a. cAMP is found in smell and natural sugar pathways.
- b. Salty and sour tastes are mediated by amiloride-sensitive Na⁺ channels, and umami taste uses a different pathway.
- c. IP3R1 and T2R1 are involved in taste signaling.
- d. Umami is mediated by a G-protein receptor, while T1R is involved in artificial sweetener and bitter taste signaling.
- e. IP3 is a second messenger in taste transduction.

Ans: d

8. One of the following statements is false:

Taste buds are in the lingual papillae only

