Laboratory Exercises for May 15, 2006

Name ________________________________

Name five accessory eye structures that contribute to the formation of tears and/or aid in lubrication of the eyeball, and then name the major secretory product of each. Indicate which has antibacterial properties by circling the correct secretory product.

<table>
<thead>
<tr>
<th>Accessory structures</th>
<th>Product</th>
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Identify the extrinsic eye muscle predominantly responsible for the actions described below.

1. turns the eye laterally
2. turns the eye medially
3. turns the eye up and laterally
4. turns the eye inferiorly
5. turns the eye superiorly
6. turns the eye down and laterally
Using the terms in the key on the right, correctly identify all structures provided with leader lines in the diagram.

**Key:**

1. anterior chamber
2. anterior segment containing aqueous humor
3. bipolar neurons
4. choroid
5. ciliary body and processes
6. ciliary muscle
7. cornea
8. dura mater
9. fovea centralis
10. ganglion cells
11. iris
12. lens
13. optic disc
14. optic nerve
15. photoreceptors
16. posterior chamber
17. retina
18. sclera
19. scleral venous sinus
20. suspensory ligaments
21. vitreous body in posterior segment

Notice the arrows drawn close to the left side of the iris in the diagram above. What do they indicate?
Match the key responses with the descriptive statements that follow.

<table>
<thead>
<tr>
<th>Key:</th>
<th>a. aqueous humor</th>
<th>b. choroid</th>
<th>c. ciliary body</th>
<th>d. ciliary processes of the ciliary body</th>
<th>e. cornea</th>
<th>f. fovea centralis</th>
<th>g. iris</th>
<th>h. lens</th>
<th>i. optic disc</th>
<th>j. retina</th>
<th>k. sclera</th>
<th>l. scleral venous sinus</th>
<th>m. suspensory ligament</th>
<th>n. vitreous humor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>attaches the lens to the ciliary body</td>
<td>2. fluid filling the anterior segment of the eye</td>
<td>3. the “white” of the eye</td>
<td>4. part of the retina that lacks photoreceptors</td>
<td>5. modification of the choroid that controls the shape of the crystalline lens</td>
<td>6. contains the ciliary muscle</td>
<td>7. drains the aqueous humor from the eye</td>
<td>8. tunic containing the rods and cones</td>
<td>9. substance occupying the posterior segment of the eyeball</td>
<td>10. forms the bulk of the heavily pigmented vascular tunic</td>
<td>11. smooth muscle structures</td>
<td>12. area of critical focusing and discriminatory vision</td>
<td>13. form (by filtration) the aqueous humor</td>
<td>14. light-bending media of the eye</td>
</tr>
</tbody>
</table>

The iris is composed primarily of two smooth muscle layers, one arranged radially and the other circularly.

Which of these dilates the pupil? ____________________________________________________________

You would expect the pupil to be dilated in which of the following circumstances? Circle the correct response(s).

a. in brightly lit surroundings    c. during focusing for near vision
b. in dimly lit surroundings      d. in observing distant objects

The intrinsic eye muscles are under the control of which of the following? (Circle the correct response.)

autonomic nervous system    somatic nervous system
Select the terms from column B that apply to the column A descriptions. Some terms are used more than once.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
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<tbody>
<tr>
<td>______, ______, ______  1. structures composing the outer or external ear</td>
<td>a. auditory (pharyngotympanic) tube</td>
</tr>
<tr>
<td>______, ______, ______  2. structures composing the inner ear</td>
<td>b. cochlea</td>
</tr>
<tr>
<td>______, ______, ______  3. collectively called the ossicles</td>
<td>c. endolymph</td>
</tr>
<tr>
<td>______, ______, ______  4. ear structures not involved with audition</td>
<td>d. external auditory canal</td>
</tr>
<tr>
<td>______  5. involved in equalizing the pressure in the middle ear with atmospheric pressure</td>
<td>e. incus (anvil)</td>
</tr>
<tr>
<td>______  6. vibrates at the same frequency as sound waves hitting it; transmits the vibrations to the ossicles</td>
<td>f. malleus (hammer)</td>
</tr>
<tr>
<td>______, ______  7. contain receptors for the sense of balance</td>
<td>g. oval window</td>
</tr>
<tr>
<td>______  8. transmits the vibratory motion of the stirrup to the fluid in the scala vestibuli of the inner ear</td>
<td>h. perilymph</td>
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<tr>
<td>______  9. acts as a pressure relief valve for the increased fluid pressure in the scala tympani; bulges into the tympanic cavity</td>
<td>i. pinna</td>
</tr>
<tr>
<td>______  10. passage between the throat and the tympanic cavity</td>
<td>j. round window</td>
</tr>
<tr>
<td>______  11. fluid contained within the membranous labyrinth</td>
<td>k. semicircular canals</td>
</tr>
<tr>
<td>______  12. fluid contained within the osseous labyrinth and bathing the membranous labyrinth</td>
<td>l. stapes (stirrup)</td>
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<td>m. tympanic membrane</td>
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<td>n. vestibule</td>
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</table>
Identify all indicated structures and ear regions in the following diagram.

Match the membranous labyrinth structures listed in column B with the descriptive statements in column A:

**Column A**

1. sacs found within the vestibule
2. contains the organ of Corti
3. sites of the maculae
4. positioned in all spatial planes
5. hair cells of organ of Corti rest on this membrane
6. gelatinous membrane overlying the hair cells of the organ of Corti
7. contains the crista ampullaris
8. function in static equilibrium
9. function in dynamic equilibrium
10. carries auditory information to the brain
11. gelatinous cap overlying hair cells of the crista ampullaris
12. grains of calcium carbonate in the maculae

**Column B**

a. ampulla
b. basilar membrane
c. cochlear duct
d. cochlear nerve
e. cupula
f. otoliths
g. saccule
h. semicircular ducts
i. tectorial membrane
j. utricle
k. vestibular nerve