

YR 1 HISTOLOGY UNIT EXAMINATION 2 -- October 10, 1997.

CHOOSE THE SINGLE BEST ANSWER FOR QUESTIONS 1 - 52.

QUESTIONS 1 - 19 ARE TO BE ANSWERED IN CONJUNCTION WITH THE SLIDES THAT WILL BE PROJECTED DURING THE EXAMINATION.

1. The follicle indicated LACKS which structure?
 - A. Primary oocyte
 - B. Germinal vesicle
 - C. Follicular cells
 - D. Basement membrane
 - E. Zona Pellucida

2. The structure indicated is the:
 - A. Stria vascularis
 - B. Basilar membrane
 - C. Spiral ligament
 - D. Utricular or saccular macula
 - E. Modiolus

3. Identify:
 - A. Parathyroid (adult)
 - B. Pituitary (pars nervosa)
 - C. Dermis
 - D. Pineal
 - E. Sublingual gland

4. This structure is involved in:
 - A. Secretion of alpha-amylase and lysozyme
 - B. Secretion of mucus (glycoproteins)
 - C. Production and release of secretory IgA
 - D. Modification of the ionic content of saliva
 - E. Contractile movement to increase flow of saliva

5. The structure indicated is most important for:
 - A. Producing tears
 - B. Secretion of aqueous humor
 - C. Using hair follicles as secretory channels
 - D. Secreting an oily film
 - E. Producing a non-hydrated precursor of vitreous humor

6. Which statement is FALSE about the structure indicated?
 - A. This structure is the primary site of gas and nutrient exchange between maternal and fetal blood.
 - B. Branching of these structures increases during pregnancy.
 - C. Oligohydramnios is loss of the fluid surrounding these structures.
 - D. The endocrine function of the placenta is attributed to these structures.
 - E. These structures give a fibrous appearance to the full term placenta (afterbirth) when it (the placenta) is cut open.

7. This slide illustrates all of the following cell types EXCEPT:
 - A. Serous cell
 - B. Mucous cell
 - C. Myoepithelial cell
 - D. Intercalated duct cell
 - E. Fibroblast

8. The region indicated is:
- A. Made up mainly of dense irregular connective tissue
 - B. Derived from the outer layer of the optic cup
 - C. Highly vascularized
 - D. Rich in corneal proteoglycan
 - E. Transparent when unstained by histological techniques
9. The space indicated lies within the:
- A. Foregut
 - B. Dorsal aorta
 - C. Intraembryonic cavity (coelom)
 - D. Neural tube
 - E. Heart
10. This anomaly:
- A. Is the result of failure to merge
 - B. Is the result of failure of neural crest cells to migrate
 - C. Occurs between a pharyngeal arch-derived structure and a non pharyngeal arch-derived structure
 - D. All of the above are true
 - E. None of the above are true

11. All of the following are TRUE of this endocrine gland, EXCEPT:
- A. It remains attached to the roof of the third ventricle
 - B. It is covered by a capsule that is continuous with the pia mater
 - C. It synthesizes melatonin, serotonin and other specific peptides
 - D. It contains Herring bodies, accumulations of neurosecretory material
 - E. Its specific cell type is supported by less numerous glial cells
12. The structure (area) indicated by the pointer is:
- A. A pharyngeal groove
 - B. Lined by endoderm
 - C. Named (numbered) by its relationship to the structure immediately caudal to it
 - D. All of the above are true
 - E. None of the above are true
13. The structure indicated in the Day 20 embryo will form:
- A. The brain
 - B. A limb
 - C. The heart
 - D. Skin
 - E. The mouth
14. Identify this gland:
- A. Parathyroid
 - B. Submandibular
 - C. Pineal
 - D. Sublingual
 - E. Parotid

15. The region indicated by the pointer contains the:
- A. Stomodeum
 - B. Anterior neuropore
 - C. Cloacal membrane
 - D. Anterior intestinal portal
 - E. First aortic arch
16. The structure indicated:
- A. Contains calcium phosphate crystals
 - B. Functions in auditory transduction
 - C. Is bathed by perilymph
 - D. Is deflected like a sail by fluid movement
 - E. Is composed of cells derived from the otic capsule
17. Which statement is TRUE about the slide shown?
- A. The morphology of this structure indicates that the cell is a spermatid in the acrosomal phase of spermiogenesis.
 - B. The prominent organelle indicated was derived from the Golgi apparatus.
 - C. The dense granule within this structure initiates the formation of the axoneme.
 - D. The organelle indicated in this cell retains a similar round appearance in the mature spermatozoan.
18. In the adult, this space is predominantly composed of:
- A. A clear liquid high in potassium ions and low in sodium ions
 - B. A gel containing hyaluronic acid and some type II collagen
 - C. Greatly elongated, epithelially-derived cells
 - D. A clear liquid high in sodium ions and low in potassium ions
 - E. A rich network of blood vessels

19. All of the following are TRUE regarding the structure EXCEPT:
- A. It contributes to the formation of heart structures
 - B. Its outer layer is composed of ectoderm
 - C. It is formed by transverse body folding
 - D. it lies between the extraembryonic cavity (coelom) and the amniotic cavity
 - E. Its inner layer is somatic mesoderm

END OF PROJECTED SLIDES

20. Occlusion (blockage) of the apical foramen of a tooth is most likely to result in damage to:
- A. Enamel
 - B. Cementum
 - C. Dental pulp
 - D. Periodontal membrane
 - E. Gingival attachment
21. The decidua basalis will not be maintained during the first month of pregnancy if the trophoblast fails to secrete:
- A. Progesterone
 - B. Estrogen
 - C. Follicle stimulating hormone (FSH)
 - D. Chorionic gonadotropin (hCG)
 - E. Placental lactogen (hPL)

22. During activation of the semicircular duct, all of the following occur EXCEPT:
- A. The stereocilia are displaced because they are embedded in a gelatinous membrane, the cupula
 - B. Action potentials are conducted by the hair cell axons to the vestibular nuclei of the brain stem
 - C. The sensory area affected is the crista ampullaris
 - D. Connecting fibers between adjacent hair cell stereocilia open mechanically-gated potassium channels
23. Which of the following is/are TRUE?
- A. Both fusion and merging require migration of neural crest cells
 - B. Merging involves coherence of two separate adjacent parts
 - C. Fusion involves "smoothing out" a groove
 - D. All of the above are true
 - E. None of the above are true
24. The prerequisite for the acrosome reaction is:
- A. Capacitation
 - B. Exposure to seminal plasma
 - C. Release of acrosin
 - D. Hyaluronidase activity
 - E. Fusion of the inner and outer acrosomal membranes

25. Which of the following events in limb development does NOT occur during the embryonic and fetal periods?
- A. Formation of the apical ectodermal ridge
 - B. Major susceptibility to teratogens such as thalidomide
 - C. Formation of secondary centers of ossification
 - D. Formation of a cartilage model of the limb bones
 - E. Appearance of digital rays
26. Which of the following are CORRECTLY defined **FROM INSIDE TO OUTSIDE**?
- A. Primary villi : mesoderm, cytotrophoblast, syncytiotrophoblast
 - B. Secondary villi : mesoderm, syncytiotrophoblast, cytotrophoblast
 - C. Tertiary villi : capillaries, cytotrophoblast, mesoderm, syncytiotrophoblast
 - D. Secondary villi : syncytiotrophoblast, mesoderm, cytotrophoblast
 - E. Tertiary villi : capillaries, mesoderm, cytotrophoblast, syncytiotrophoblast
27. The secretory activity of the follicular cells of the thyroid is:
- A. Directly related to the activity of the parafollicular cells
 - B. Significantly enhanced after pituitary removal
 - C. Regulated by hypophyseal thyroid stimulating hormone (TSH)
 - D. Inversely related to the activity of the parathyroid's chief cells

28. Steroidogenesis in the ovarian follicle requires the:
- A. Oocyte and corona radiata cells
 - B. Granulosa and theca interna cells
 - C. Theca interna and theca externa cells
 - D. Theca externa and granulosa cells
 - E. Theca interna and oocyte
29. During the development of the skull, all of the following are TRUE EXCEPT:
- A. The parietal bones develop as part of the membranous neurocranium
 - B. failure of the anterior neuropore to close can lead to anencephaly (meroanencephaly) and acrania
 - C. The mandible is formed by intramembranous ossification
 - D. The otic capsule contributes to the formation of the petrous temporal bone
 - E. The sutures ossify completely at about 2 years after birth
30. Longitudinal head folding of the embryo causes the:
- A. Cranial-most portion of the neural tube to be caudal to the heart tube
 - B. Septum transversum to move to a position dorsal to the foregut
 - C. Heart tube to become located caudal to the stomodeum
 - D. Embryo to lie within the yolk sac
 - E. Foregut to form ventral to the heart tube

31. Which of the following statements about the pupillary dilator muscle is CORRECT?
- A. It is innervated by parasympathetic axons
 - B. It regulates tension on the lens via suspensory ligaments (zonule fibers)
 - C. Its muscle fibers are arranged radially with respect to the iris
 - D. It is derived from head mesenchyme
 - E. It is composed mainly of striated muscle cells
32. Pharyngeal arch I gives rise to:
- A. Lateral palatine processes
 - B. Nasal septum
 - C. Primary palate
 - D. All of the above are true
 - E. None of the above are true
33. Indicate the INCORRECT statement concerning the pituitary.
- A. The infundibular stalk connects the pars nervosa to the brain.
 - B. Histological staining characteristics (light microscopic level) and secretory granule morphology (electron microscopic level) allow the characterization of hormonal products in the cells of the pars distalis.
 - C. Herring bodies are intracellular accumulations of neurosecretory product present in the neurohypophysis.
 - D. True mammatropes control prolactin (PRL) or lactogenic hormone (LTH).
 - E. Release of most hormones synthesized by the adenohypophysis is directly induced by the target organ/tissue.

34. Gastrulation results in formation of all the following EXCEPT the:
- A. Intraembryonic mesoderm
 - B. Primitive streak
 - C. Intraembryonic endoderm
 - D. Notochordal process
 - E. Prochordal plate
35. The zona pellucida:
- A. Forms during oocyte growth in the primary follicle
 - B. Derives from the basement membrane of the primordial follicle
 - C. Prevents contact between the corona radiata and primary oocyte
 - D. Consists of two separate glycoproteins, one that provides a site for initial sperm binding and another that triggers the acrosome reaction
 - E. Dissolves within 24 hours of fertilization so that embryonic cells can contact the maternal tissues
36. All of the following are TRUE regarding the development of the vertebrae EXCEPT
- A. The vertebrae are derived from the sclerotome portion of the somite
 - B. The somites are arranged intersegmentally with respect to the spinal cord
 - C. Centers of chondrification and primary ossification appear within the vertebrae during the embryonic period of development
 - D. The primordia of the ribs first appear as processes (costal processes) of the vertebrae
 - E. Defects in the closure of the vertebral arch are found in all types of spina bifida

37. The primary palate is derived from the:
- A. Intermaxillary segment
 - B. Lateral palatine processes
 - C. Lateral nasal prominences
 - D. All of the above are true
 - E. None of the above are true
38. All of the following are TRUE of the parathyroids EXCEPT:
- A. Their activity increases Ca^{2+} releasing by chondrocytes and chondroclasts
 - B. Secretion of parathormone (PTH) is stimulated by a decrease in Ca^{2+} levels in the blood
 - C. They synthesize PTH which has an effect opposite that of calcitonin in regulating calcium blood levels
 - D. They are essential for life
 - E. They contain acidophilic oxyphil cells
39. During transverse folding of the embryo, all of the following are TRUE EXCEPT:
- A. The intraembryonic cavity is displaced from a position lateral to the somites to a ventral position surrounding the midgut.
 - B. The serous membranes surrounding the internal organs are derived from the visceral mesoderm in the splanchnopleure.
 - C. The amnion is displaced ventrally to sheath the umbilical cord and surround the embryo within the amniotic cavity.
 - D. The ventral body wall is formed by ventral displacement of the somatopleure, giving the body its cylindrical shape
 - E. The interior of the intraembryonic cavity becomes lined with intraembryonic endoderm as it wraps around the midgut.

40. All of the following statements are CORRECT regarding taste buds EXCEPT they:
- A. Are located within the epithelium on the dorsal and lateral surfaces of the tongue
 - B. Are renewed on a regular basis with new cells derived from a dividing population of stem cells
 - C. Are found in association with fungiform, foliate and circumvallate papillae
 - D. Transduce taste impulses through interactions with ion channels and second messenger systems
 - E. Contain taste pores through which axonal processes extend into the underlying connective tissue
41. Your patient has the following symptoms: Shortness of stature with normal trunk length but short limbs and digits. Your observations of the patient over several years indicate that the shortness of the limbs is due to disturbance in endochondral ossification at the epiphyseal plate. Of the following list, the best term for this condition would be:
- A. Achondroplasia
 - B. Syndactyly
 - C. Merolmelia
 - D. Rachischisis
 - E. Craniosynostosis
42. Primordial germ cells DO NOT:
- A. Migrate into structures formed by the intermediate intraembryonic mesoderm
 - B. Originate from neural crest cells
 - C. Form the primary sex cords in the genital ridge near the mesonephros
 - D. Produce gonocytes in the embryonic testis
 - E. Generate about 1,000,000 primary oocytes by birth in a female

43. The adult eustachian (auditory) tube:
- A. Is derived from ectoderm
 - B. Connects the pharynx with the external acoustic meatus
 - C. Is associated with the site of the pharyngeal tonsil
 - D. All of the above are true
 - E. None of the above are true
44. The primitive node is the site of origin of the:
- A. Notochordal process
 - B. Extraembryonic mesoderm
 - C. Yolk sac endoderm
 - D. Prochordal plate
 - E. Epidermis
45. Select the structure that can be described best as a layer of pigmented connective tissue which absorbs light that has already passed through the retina.
- A. Anterior corneal epithelium
 - B. Retinal pigment epithelium
 - C. Sclera
 - D. Iris stroma
 - E. Choroid

46. All of the following are TRUE of the endocrine glands EXCEPT:
- A. Hormonal products are usually discharged into the tissue space surrounding fenestrated capillaries.
 - B. Hormones in the pituitary, thyroid and parathyroid glands are stored until releasing and/or stimulating factors induce their discharge.
 - C. Their ducts end abruptly before reaching an epithelial surface.
 - D. They are derived embryonically from epithelia.
 - E. Most endocrine glands consist of polyhedral cells which form clumps, cords and/or plates supported by delicate connective tissue fibrils and permeated by an extensive capillary network.
47. The neural crest cells form:
- A. The adrenal cortex
 - B. Tooth enamel
 - C. Melanocytes
 - D. Central nervous system
 - E. Thyroid follicular cells
48. Which of the following statements is CORRECT regarding the development of the pharyngeal apparatus and tongue?
- A. The median tongue bud (tuberculum impar) forms most of the anterior 2/3 of the tongue.
 - B. The palatine tonsils are derived from pharyngeal groove III.
 - C. The thyroid gland is derived from the lateral portion of pharyngeal arch III.
 - D. The occipital somites produce most of the intrinsic tongue muscles.
 - E. The thymus is derived from pharyngeal arch II.

49. Sertoli-spermatid junctions:

- A. Are identical to Sertoli-Sertoli junctions
- B. Separate the adluminal and basal compartments
- C. Exhibit bundles of microfilaments only on the Sertoli cell side
- D. Are the site of the blood-testis barrier
- E. Form during spermiation

MATCHING ITEMS

In each of the following groups there are two lists. Mark on the answer sheet in the line corresponding to each question number in the lower list (50-52) the letter of the related item of the upper list.

DIRECTIONS: Select the option (A-H below) which best fits the descriptions numbered 50-52.

- A. Vestibule
- B. Neural retina
- C. Lens
- D. Utricular Macula
- E. Corneal stroma
- F. Bulbar conjunctiva
- G. Modiolus
- H. Pigmented layer of ciliary epithelium

- 50. This structure is derived from an ectodermal placode originally adjacent to the prosencephalon.
- 51. This structure is derived from the outer layer of the optic cup.
- 52. This structure is derived from the otocyst (otic vesicle).