

**Biology of Salivary Glands 513**  
**Final Examination**  
**June 19, 2001**

**Multiple Choice**

1. The production of lactoferrin is not considered a type of “nutritional immunity” because
  - a. lactoferrin actually feeds iron to the oral microorganisms and, thereby, poisons them.
  - b. lactoferrin withholds iron from mucosal tissues and, thereby prevents magnetic adherence.
  - c. the form of iron bound by lactoferrin cannot be used by oral microorganisms.
  - d. lactoferrin inhibits the ability of many bacteria to utilize glucose.
  - e. none of the above. **(correct)**
  
2. The sialoperoxidase system is self-regulating due to the fact that
  - a. it is activated whenever thiocyanate is present.
  - b. it is activated whenever there is a low pH in the mouth.
  - c. it is activated only when a patient smokes.
  - d. all of the above
  - e. none of the above**(correct)**
  
3. What is the evidence that amylases serve more than a nutritional function?
  - a. They have no antibacterial activity.
  - b. They are found in body secretions having nothing to do with nutrition. **(correct)**
  - c. They are broken down by bacterial proteases.
  - d. a and b
  - e. none of the above
  
4. Difficulty in rapidly performing more than two quick swallows in a row is due to
  - a. salivary reflux phenomenon.
  - b. pyosalpingitis.
  - c. the throat muscles becoming fatigued.
  - d. lack of oral lubrication. **(correct)**
  - e. none of the above

5. Organized mucosa-associated lymphoid tissue is
- found in the lymph nodes.
  - associated with initial immune response to antigen . **Correct**
  - filled with plasma cells that are producing antibodies.
  - composed primarily of M-cells and L-cells.
  - none of the above
6. Transepithelial transport of antigen is important because without it
- antigen would only be detected by the lymphoid cells in O-MALT.
  - antigen would not be detected by the lymphoid cells in the alternate complement pathway.
  - polymeric antibody would be pumped through the epithelial cells
  - vascular addressins would target the wrong cell types.
  - none of the above **Correct**
7. Saliva is an excellent body fluid to use to determine compliance in clinical studies because
- collection is non-invasive. **Correct**
  - it is easier to store.
  - it is thick.
  - it is clear
  - none of the above.
8. Gingival crevicular fluid is
- produced by minor salivary glands.
  - exudate from the buccal surfaces of the gingiva.
  - derived from serum that is expressed from inflamed gingival sulci. **Correct**
  - derived from saliva that is expressed from inflamed blocked salivary glands.
  - none of the above.
9. Gene therapy procedures allow investigators to
- add new metabolic functions to cells that previously did not have those functions.
  - avoid the use of restriction endonucleases.
  - introduce anti-metabolic activities to disrupts tumor cell growth.
  - a and c. **Correct**
  - none of the above.

10. Mucosal immunity provides most of its protection by blocking
- microbial receptors specific for colonization.
  - the complement cascade.
  - blocking penetration of undigested food products into the mucosal tissues.
  - a and c **Correct**
  - none of the above
11. Protease resistance is an important feature for a secretory immunoglobulin protein because
- the mucosal surfaces are generally parts of the body rich in proteolytic microorganisms. **Correct**
  - secretory component is very susceptible to proteolysis.
  - complement activation generates protease activity that would degrade them.
  - a and b
  - none of the above
12. The homing specificity of cells of the O-MALT are acquired upon
- neonatal development of the cells
  - exposure to D-MALT
  - exposure to proinflammatory cytokines
  - maturation in the O-MALT follicles **Correct**
  - none of the above
13. Restriction endonucleases are enzymes that enable the researcher to
- digest RNA that is not needed in transfection experiments.
  - cut genes out of DNA.. **Correct**
  - digest protein is that bound to DNA that might interfere with the gene transfer.
  - reconnect oligonucleotides into continuous strands of DNA.
  - none of the above

14. If you were to use saliva to monitor levels of a protease-sensitive medication, it would be worst to use whole saliva, because
- a. it could be collected without contamination by other substances, potentially proteolytic, found in whole saliva.
  - b. whole saliva contains high concentrations of protease inhibitors.
  - c. it contains high concentrations of mucins that inhibit proteolytic activity.
  - d. all of the above
  - e. none of the above **Correct**
15. A major problem with viral-based gene therapy methods is that:
- a. the viruses are usually not tissue or host specific.
  - b. the viruses stimulate immune responses because they are antigens.
  - c. the viruses are potential biohazards.
  - d. b and c **Correct**
  - e. none of the above

**True/False** (enter "A" for true and "B" for false)

16. All of the components found in saliva are produced by the ductal cells. **False**
17. Protection of the oral cavity is derived in part from the mucosal immune system. **True**
18. Inflammatory reactions are rarely associated with mucosal immunity. **True**
19. Secretory component is synthesized by the epithelial cells to enable transport onto the mucosal surface. **True**
20. Langerhans cells are antigen presenting cells. **True**
21. Transepithelial transport of antibody and antigen are mediated by a different systems. **True**
22. Unstimulated salivary flow is stable throughout the day. **False**
23. Whole saliva would not be expected to contain IgG. **False**
24. M-cells often enable pathogens to penetrate the epithelial cell layer of the mucosa. **True**
25. One would not expect to find SC associated with monomeric IgA in the serum. **True**

26. Non-viral methods are often used in gene therapy trials to transfer genetic material because they are much safer to use than other means. **True**
27. Homing is a process by which cells leave the D-MALT and randomly migrate until they encounter vascular addressins that bind to their cell surface receptors in O-MALT. **False**
28. Secretory IgA is a very efficient activator of complement. **False**
29. Secretory IgA is very protective to the neonate because at birth the newborn is already producing adult levels of sIgA. **False**
30. The myeloperoxidase system of the neutrophil is very similar to the sialoperoxidase system in terms of their abilities to generate toxic oxygen byproducts which are destructive to bacteria. **True**

### Multiple Choice Questions

31. A 70 year old male comes to your office complaining of difficulty speaking for more than a few minutes at a time, cheek biting, and pain wearing his partial denture. His medical history is significant for hypertension and Type II diabetes. He has been taking a total of four medications for more than 8 years to keep his conditions in control. What is the most likely diagnosis of his complaints and what is the most likely cause?
  - a. xerostomia; his medications **Correct**
  - b. a broken partial denture; a crack is probably pinching his soft tissues
  - c. xerostomia; his age, older people have dry mouths
  - d. b, c
  - e. none of the above
32. A 52 year old female presents to you with complaints of a dry mouth. She has been on a known xerostomic medication long term for hypertension. After obtaining a stimulated salivary flow rate, you conclude she has >50% decrease in flow from a healthy, non-medicated adult. What will you do?
  - a. Consult with the prescribing physician about changing the medication.
  - b. Nothing. Her flow rate is not in the xerostomic range. Reassure her that nothing is wrong.
  - c. Consult with the prescribing physician about changing the medication dose.
  - d. Consult with the prescribing physician about changing the medication administration time.
  - e. a, c, d **Correct**

33. What affects the extent to which xerostomic drugs cause xerostomia?
- a. Polypharmacy
  - b. Form, whether it is a pill or liquid
  - c. Prolonged use
  - d. a, c **Correct**
  - e. All of the above
34. In a healthy older adult not taking medications, you would expect to see the following:
- a. A significant change in salivary constituents; a significant change in salivary quantity
  - b. No significant change in salivary constituents; a significant change in salivary quantity
  - c. No significant change in salivary constituents; no significant change in salivary quantity **Correct**
  - d. A significant change in salivary constituents; no significant change in salivary quantity
  - e. none of the above
35. patient complains of painful swelling under his chin that increases at meal time. What do you suspect as the most likely diagnosis?
- a. A stone in the submandibular gland **Correct**
  - b. A tumor in the submandibular gland
  - c. A bacterial or viral infection in the submandibular gland
  - d. all of the above
  - e. none of the above
36. For the patient above, how will you confirm your suspicion?
- a. Visual inspection of the gland orifice
  - b. Bi-manual palpation of the gland
  - c. x-ray
  - d. all of the above **Correct**
  - e. none of the above

37. A 55 year old male presents on a referral from his physician. The patient has been diagnosed with a tumor in the head and neck area and is scheduled to undergo radiation therapy. He will get 6000 cGy in divided doses to his right side of his face. What will you do first?
- A Complete and thorough exam and treatment plan **Correct**
  - Send him to a hospital dental clinic; a general dentist shouldn't be treating him
  - Nothing. Tell him to return after his radiation therapy has started
  - all of the above are appropriate responses
  - none of the above are appropriate responses
38. For the patient above, considering the radiation dose and field, what are you concerned about?
- Permanent damage to the right parotid gland
  - Mucositis/dermatitis
  - Xerostomia and radiation caries
  - All of the above **Correct**
  - none of the above are correct
39. A 63 year old female with a history of 6000cGy of radiation to the left side of her face 5 years ago presents to your office. She hasn't seen a dentist since her radiation therapy. She presents to you with complaints of dry mouth and sensitive teeth. You diagnose her with xerostomia and radiation caries. For her xerostomia you:
- Recommend oral rinses for the dryness.
  - Recommend over-the-counter (OTC) saliva substitutes.
  - Do nothing since the glandular destruction is irreversible.
  - Recommend coating agents to lubricate.
  - a, b, d **Correct**
40. For the patient above, for her radiation caries you:
- Automatically extract all her teeth since she will always have xerostomia and her teeth have a hopeless future
  - Restore what is clinically possible minimizing invasive oral surgery
  - Instruct her on proper oral care
  - Fabricate fluoride trays and prescribe fluoride
  - b, c, d **Correct**

### **True or False?**

41. Patient compliance with saliva substitutes is poor because the substitutes just feel too much like real saliva. **True**
42. The generally acceptable flow rate in a healthy non-medicated adult is 0.3-0.4ml/min resting and 1-2ml/min stimulated. **True**
43. Anatomical strictures in salivary glands can mimic stone obstruction in clinical presentation of symptoms. **True**
44. At least 6000cGy of radiation are needed to induce permanent destruction in salivary glands. **False**
45. Irradiated tissue completely revascularizes after a healing period of time. **False**
46. Xerostomia complaints increase with polypharmacy and prolonged use of medications. **True**
47. Xerostomia is only caused by prescription drug use. **False**
48. Meticulous oral hygiene is not important with xerostomia since there isn't much saliva anyway. **False**
49. Chemotherapy-induced xerostomia is permanent. **False**
50. One indication that a salivary gland infection may be bacterial rather than viral is the expression of pus from the orifice. **True**