

Biology of the Salivary Glands 513 (KEY)

FINAL Examination

June 23, 1998

1. You are analyzing gingival crevicular fluid from a patient and you find high levels of IgG and IgM present. What do you suspect?
 - a. The patient has a significant level of gingival inflammation. **Correct**
 - b. The patient is unable to make sIgA.
 - c. The patient has excellent oral hygiene.
 - d. all of the above
 - e. none of the above

2. You determine that the saliva from a patient has a very low sIgA content. You know that this patient has no health problems. How can this (good health) be possible?
 - a. The mucosal immune system often stops producing IgA in order to permit secretory component recycling.
 - b. It is not unusual to find healthy subjects having a selective IgA deficiency. **Correct**
 - c. The mucosal immune system often produces sIgD in place of sIgA with no ill effects.
 - d. none of the above
 - e. all of the above

3. How do IgG and IgM antibodies enter saliva?
 - a. It is usually a result of extravasation secondary to an inflammatory event. **Correct**
 - b. They are pumped into the ducts by acinar cells.
 - c. It generally happens only when there is a traumatic blow to the head which results in bleeding in the mouth.
 - d. none of the above
 - e. all of the above

4. The secretory component is produced by _____ and serves as _____.
 - a. macrophages, a complement receptor
 - b. epithelial cells, a polymeric IgA receptor **Correct**
 - c. B cells, an antigen receptors
 - d. T cells, a type I MHC receptor
 - e. none of the above

5. Specific recognition sites on tissues aid in the homing of lymphocytes. These are known as:
- vascular addressins **Correct**
 - vascular interdoodies
 - vascular homogrens
 - superantigens
 - none of the above
6. A gram negative bacteria enters the oral cavity, yet the lysozyme is unable to perform its function in the oral cavity. Why?
- Lysozyme acts on starches and has no effect on bacteria.
 - Lysozyme acts only on yeasts.
 - Gram negative microorganisms cannot be degraded by lysozyme.
 - Gram negative microorganisms are more resistant to lysozyme. **Correct**
 - none of the above
7. What is the primary function of myeloperoxidase?
- Involved in the oxygen-dependent cytotoxic system of neutrophils. **Correct**
 - Involved in the oxygen-independent cytotoxic system of neutrophils.
 - Protects the host by destroying hydrogen peroxide.
 - all of the above
 - none of the above
8. The ability for a lysozyme to lyse the peptidoglycan layer is referred to as:
- peptidolysase activity
 - squamase activity
 - killthesuckeracide activity
 - muramidase activity **Correct**
 - none of the above
9. The substance that protect against unwanted proteolysis by inhibiting the cysteine-proteases is
- cysteracoids
 - cystatins **Correct**
 - proteoloids
 - askerdoodles
 - none of the above

10. Sialoperoxidase (SP) is produced by acinar cells and is similar in function to Myeloperoxidase (MP) produced by what blood cells?
- T cells
 - B cells
 - Neutrophils **Correct**
 - Doodlecells
 - none of the above
11. Lysozyme function to:
- induce cationic-dependent activation of bacterial autolysins
 - aggregate bacteria
 - inhibit glucose uptake by bacteria
 - all of the above **Correct**
 - none of the above
12. Salivary factors that may result in adherence of oral bacteria to tooth surfaces are:
- amylases
 - mucins
 - proline-rich proteins
 - all of the above **Correct**
 - none of the above
13. Which of the following participates in nutritional immunity?
- lysozyme
 - lactoferrin **Correct**
 - histatin
 - myeloperoxidase
 - none of the above
14. Which of the following is not true about sialoperoxidase system?
- produced in acinar cells of parotid glands
 - present in submandibular saliva
 - readily absorbed to oral surfaces
 - utilizes thiocyanate ion to form peroxide
 - none of the above **Correct**

15. In considering the process by which oral microorganisms are regulated by SP/MP, place the following in the correct sequence:
- 1) oxidation of sulfhydryl groups of bacterial enzymes
 - 2) secretion of SP by salivary glands
 - 3) production of H_2O_2 by facultative aerobes
 - 4) H_2O_2 and SCN^- in the presence of SP and low pH yields $OSCN^-$ and $HSCN$
- a. 1,2,3,4
 - b. 2,3,4,1
 - c. 3,2,4,1 **Correct**
 - d. 2,4,3,1
 - e. none of the above.
16. What are the advantages of testing saliva over other bodily fluids?
- a. saliva is very easy to obtain
 - b. saliva collection does not create discomfort
 - c. saliva is sterile
 - d. a and b **Correct**
 - e. all of the above.
17. Which of the following contaminants of saliva is the most important to exclude from samples for testing for immunoglobulin concentrations?
- a. minor gland products
 - b. bacteria
 - c. gingival crevicular fluid **Correct**
 - d. sIgA
 - e. none of the above
18. Two patients are in your office, one has asthma and the other has cystic fibrosis. Which of the following factors would be the most helpful in determining which patient has cystic fibrosis?
- a. chondroitin A levels
 - b. stimulated parotid gland secretions
 - c. von Ebner gland secretions
 - d. very low labial gland secretions **Correct**
 - e. none of the above.

19. What does an increase in GCF indicate?
- a. increased gingival inflammation
 - b. ovulation during the menstrual cycle
 - c. a and b **Correct**
 - d. minor salivary gland stimulation
 - e. none of the above
20. Digitalis toxicity in patients can be determined by which of the following clinical signs?
- a. increased cyclosporin A in the saliva
 - b. increased calcium and potassium in the saliva **Correct**
 - c. decreased sIgA in the saliva
 - d. decreased secretory component in the saliva
 - e. all of the above.
21. Why isn't saliva used to diagnose disease more frequently?
- a. not all patients can provide sufficient saliva for the tests
 - b. lack of general acceptance by physicians
 - c. unavailability of many test kits
 - d. b and c **Correct**
 - e. none of the above
22. Why was the rice test sometimes effective in detecting lies?
- a. rice turns color when one lies
 - b. a chemical in rice reacts with hormones produced during stress
 - c. increased salivary flow during stress results in excess amylase that breaks down the starch in rice
 - d. guilt or anxiety decrease salivary flow **Correct**
 - e. none of the above

23. How does sIgA function to protect mucosal surfaces?
- When it interacts with microorganisms the complement system is activated and neutrophils are attracted to the site of infection.
 - The sIgA coats microorganisms and prevents them from adhering to mucosal surfaces. **Correct**
 - sIgA induces an inflammatory reaction resulting in clearance of the microorganisms
 - a and c
 - none of the above
24. Why is mucin considered a double edged sword?
- When bound to oral surfaces, mucins allow bacteria to adhere to tissues
 - When in solution, mucins aggregate bacteria and help to eliminate them
 - When in solution, mucins are toxic to both tissues and to microorganisms
 - a and b **Correct**
 - none of the above.
25. Based on what components found in high concentration in saliva can we develop a vaccine against caries?
- sIgA **Correct**
 - IgG
 - IgM
 - all of the above.
 - none of the above.
26. Why do some microorganisms such as *E. coli* produce enterochelins?
- Enterochelins degrade sIgA
 - Enterochelins neutralize IgA proteases
 - Enterochelins are able to compete with lactoferrin for Fe³⁺ **Correct**
 - Enterochelins bind sIgA
 - none of the above
27. Which of the following is a function of lysozyme?
- aggregation of bacteria
 - de-chaining streptococci
 - inhibiting glucose metabolism
 - all of the above **Correct**
 - none of the above

28. You eat a meal. The actively metabolizing microorganisms produce hydrogen peroxide, consume oxygen, and produce acid. What system would protect you from developing caries by inhibiting bacterial growth and metabolism?
- complement cascade
 - blood clotting factors
 - heat shock proteins
 - sialoperoxidase **Correct**
 - none of the above
29. Denture wearers tend to have a problem with thrush because the dentures shield the tissue from what *Candida albicans* inhibitory component found in saliva?
- nitric oxide
 - histatins **Correct**
 - rhodamine isothiocyanate
 - BT
 - none of the above
30. Saliva is thought of as a mirror of the body. Which of the following suggests that saliva would make a good diagnostic fluid?
- It reflects systemic levels of natural substances in the body.
 - It reflects systemic levels of therapeutic agents in the body.
 - It reflects the effects of a variety of systemic diseases.
 - all of the above **Correct**
 - none of the above
31. What effects does aging have on quantity and quality of saliva output?
- little in the otherwise healthy subject **Correct**
 - significant depression of salivary fluid
 - significant depression of salivary proteins
 - b and c
 - none of the above
32. What is the difference between unstimulated and stimulated saliva secretion?
- unstimulated saliva confers the most protection to the oral surfaces.
 - stimulated saliva is most important during mastication of food.
 - stimulated saliva is primarily a product of the parotid glands.
 - all of the above **Correct**
 - none of the above

33. Person A normally produces 1000 ml/day of saliva, whereas person B produces 3000 ml/day. Person B then begins taking an antidepressant which causes his flow rate to drop to 1500 ml/day. Who now is at greater risk for dental caries and other such oral sequelae of salivary dysfunction, person A (1000 ml/day) or person B (1500 ml/day)?
- Person A, because his/her saliva rate is lower than person B
 - Person B, because he/she is now producing an lower amount of saliva relative to his/her normal amount **Correct**
 - Neither, you must produce less than 1000 ml/day in order to experience oral sequelae of salivary dysfunction
 - Their risk is the same because they are producing approximately the same amount per day (between 1000 and 2000 ml/day)
 - none of the above

Decide whether the diseases below, causing salivary gland dysfunction are

- local
- inflammatory
- systemic
- extraterrestrial
- none of the above

(Pick the best answer from this list for questions 34-39. Each response may be used more than once).

34. Sjögren's syndrome **C**
35. cystic fibrosis **C**
36. cancer of the salivary gland **A**
37. allergic parotiditis **A/B**
38. acute bacterial sialadenitis **A/B**
39. alien extraterrestrial disease **de**
40. Radiation is known to:
- kill cancer cells
 - cause long term DNA damage in salivary glands
 - help bring the flavor out in preserved foods
 - a and b **Correct**
 - none of the above
41. What is/are the major advantage of using non-viral methods in gene transfers?
- safety **Correct**
 - more efficient than viral methods
 - more analogous to methods used by nature.
 - all of the above
 - none of the above

42. What is a primary target of gene therapy of oral cancers?
- a. the T4 antigen that is present in all oral neoplasms
 - b. the rhinoviruses that are present in many oral neoplasms
 - c. human papillomaviruses that are present in many oral neoplasms **Correct**
 - d. all of the above
 - e. none of the above
43. Gene transfer has made remarkable progress in molecular biology. Which one of these are clinical/practical applications of gene therapy:
- a. correction of inherited defects
 - b. production of biomolecules with pharmacologic activity
 - c. correction of acquired defects
 - d. all of the above **Correct**
 - e. none of the above
44. All of the following are true regarding gene therapy approaches, except:
- a. ribozymes act as enzymes to cleave RNA molecules at a specific sites
 - b. genes can be transferred via viral and non-viral methods
 - c. all promoters are equal and do not have specificity **Correct**
 - d. non-viral transfer methods are via liposomes and macromolecular conjugates
 - e. none of the above
45. Dr. Donna Scully put on her lab coat one day to try and find a cure for her patient. Foxx Molder, who has a cancerous lesion on his buccal mucosa. Molder's immune system has been highly sensitized to common viral-based gene therapy systems. Which of the methods discussed in class might be the most effective gene therapy means of treating Molder.
- a. gene transfer utilizing liposomes
 - b. utilization of a retrovirus specifically targeting the carcinoma receptor cells in Molder's Mucosa
 - c. utilization of negatively charged DNA mixed with large positively charged molecules linked to a specific ligand.
 - d. utilization of an adenovirus-based system
 - e. a and c **Correct**

46. Unstimulated basal level of saliva provides
- the least oral cavity protection
 - significant levels of watery saliva
 - the most oral cavity protection **Correct**
 - most help during mastication
 - none of the above.
47. Minor and submandibular salivary glands are important in the production of what?
- unstimulated, watery saliva
 - unstimulated, viscous saliva **Correct**
 - parotid fluid
 - GCF
 - none of the above
48. Radiation induced xerostomia or salivary dysfunction is dependent on what?
- dose of radiation
 - radiation field
 - age of patient
 - a and b **Correct**
 - none of the above.
49. A patient comes to you with complaints of dry mouth. The patient is not on any medications. What would you do first?
- prescribe antihistamine
 - suggest that he use chewing sugarless gum, candies, mints
 - suggest salivary gland surgery
 - evaluate the basis of his complaint **Correct**
 - none of the above
50. Xerostomia
- is most the prevalent side effect of drugs
 - may be a result of taking just one of the medications that may have xerostomia as a side effect
 - may be observed in patients who had radiation of the head and neck
 - all of the above **Correct**
 - none of the above