Biology of Salivary Glands 513
Final Examination
June 22, 1999

Multiple Choice (Pick the BEST answer)

1. The major causes of salivary hypofunction are:
   i. Anticholinergic drugs
   ii. Sjögren's syndrome
   iii. Head & neck radiation
   iv. Bulimia
   a. i + iii
   b. ii + iv
   c. i + ii + iii **Correct**
   d. all
   e. none of the above

2. Inflammatory conditions of the salivary glands include all of the following except:
   a. mumps
   b. acute bacterial sialadenitis
   c. recurrent herpes simplex **Correct**
   d. sialolith
   e. none of the above

3. An acute swelling of the parotid gland may be due to:
   a. mumps
   b. pleiomorphic adenoma
   c. Sjögren's syndrome
   d. Adenoid cystic carcinoma
   e. All of the above **Correct**

4. Which of the following statements is not true:
   a. older adults are more likely to have a dry mouth
   b. medications cause salivary dysfunction
   c. the aging process causes xerostomia **Correct**
   d. salivary obstructions occur in a person of any age
   e. Sjögren's syndrome primarily occurs in post-menopausal females

5, Which medication is least likely to cause a dry mouth?
   a. antihistamine
   b. antibiotic **Correct**
   c. anti-Parkinson's drug
   d. diuretic
   e. beta blocker

6. Which diseases/conditions can cause salivary dysfunction?

   a. Sjögren's syndrome, bacterial endocarditis, dehydration
   b. AIDS, dehydration, candidiasis
   c. candidiasis, AIDS, mumps
   d. dehydration, Sjögren's syndrome, sialolith **Correct**
   e. diabetes, bacterial parotitis, herpes simplex

7. The adverse affect of medications on salivary glands occurs on all of the following salivary tissues except:
    a. ductal epithelium
    b. acinar muscarinic receptors
    c. acinar baso-lateral membranes
    d. acinar luminal membranes **Correct**
    e. none of the above

8. Permanent acinar damage occurs due to:
    a. head & neck radiotherapy for cancer **Correct**
    b. antihypertensive diuretic medications
    c. mumps
    d. excessive drooling in a Down's syndrome patient
    e. none of the above

9. Salivary gland obstructions:
    a. May be prevented with antidepressants
    b. Are a nidus for retrograde infection **Correct**
    c. Are treated solely with salivary stimulants
    d. May be due to muscarinic agonists
    e. all of the above

10. When evaluating a patient with a complaint of a dry mouth, which procedure is conducted first?
    a. palpation of the salivary glands
    b. evaluation of oral mucous membranes
    c. extraoral evaluation of head and facial region
    d. review of the patient's medical and medication history **Correct**
    e. dental and gingival examination

11. Stimulation of salivary secretions in a patient with salivary hypofunction can be accomplished with the following except:
    a. adrenergic antagonists **Correct**
    b. sugarless gums
    c. muscarinic agonists
    d. gustatory stimulants
    e. none of the above

12. Pilocarpine is a viable stimulant of saliva because it is a:
    a. muscarinic antagonist
    b. beta adrenergic agonist
    c. cholinergic receptor blocker
    d. muscarinic agonist **Correct**
    e. vasointestinal peptide antagonist

13. Pilocarpine is contraindicated in a patient with the following conditions:
    a. salivary dysfunction, congestive heart failure
    b. Sjögren's syndrome, constipation
    c. congestive heart failure, diarrhea **Correct**
    d. head & neck radiation, lacrimal dysfunction
    e. all of the above

14. After you have diagnosed a patient with drug-induced salivary dysfunction, which of the following steps should be taken?
    i. Institute daily fluoride therapy
    ii. Consult with the physician about changing the drug if possible
    iii. Recommend full mouth extractions to avoid dental caries
    iv. Perform a lip biopsy to rule out Sjögren's syndrome

    a. i + iv
    b. ii + iii
    c. i + ii **Correct**
    d. iii + iv

15. The following conditions can be caused by a dry mouth:
    a. dental caries, oral fungal infections, dysgeusia **Correct**
    b. oral fungal infections, poor denture retention, trigeminal nerve impairment
    c. dysgeusia, trigeminal nerve impairment, difficulty swallowing
    d. dental caries, bony exostoses, impaired denture retention
    e. all of the above

16. Which is the best strategy for a dry mouth patient?
    a. institute fluoride therapy, chew sugarless gum before meals
    b. establish a diagnosis, prescribe pilocarpine 100 mg before bedtime
    c. prescribe fluoride with custom-made trays, sugarless gum after meals **Correct**
    d. sugarless mints after meals, start antidepressant therapy
    e. all of the above

17. Aging is associated with all of the following except:
    a. increased use of xerostomic medications
    b. greater prevalence of salivary hypofunction due to multiple medical problems
    c. greater likelihood of wearing dentures
    d. greater drug resistance to pilocarpine **Correct**
    e. none of the above

18. Fluoride is available in the following concentrations for a dry mouth with the exception of:
    a. 1.0% stannous fluoride **Correct**
    b. 1.0% sodium fluoride
    c. 1.1% sodium fluoride
    d. 0.4% stannous fluoride
    e. none of the above

19. Xerostomia is defined as:
    a. objective complaint of a dry mouth
    b. subjective complaint of a dry mouth **Correct**
    c. objective complaint of excessive saliva
    d. subjective complaint of drooling
    e. none of the above

20. The dentist must be able to diagnose salivary disorders in order to:
    a. help maintain oral & pharyngeal health
    b. provide comprehensive stomatological care
    c. prevent new and recurrent dental caries
    d. all of the above **Correct**
    e. none of the above

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

21. The primary effector functions of sIgA are the ability to stimulate an inflammatory response in mucosal tissue. **False**
22. Adult sIgA levels are attained early in neonatal development due to transepithelial transport. **False**
23. Iron-binding proteins, such as lactoferrin, are important to mucosal health because they expose toxic iron ions to bacteria. **False**
24. Many of the anti-microbial proteins of saliva protect the host by coating the microorganisms, thereby blocking their adherence receptors. **True**
25. Gingival crevicular fluid, while not a product of the acinar cells, is often found in saliva because of inflammation in the gingival crevice and leakage of fluids from the tissues. **True**
26. Due to the effects of circadian rhythms, it is critical to collect saliva at the same time of the day from a given patient participating in a research study. **True**
27. The J-chain is found associated with all polymeric immunoglobulins. **True**
28. Smokers may have a higher level of sialoperoxidase protection because their levels of thiocyante are lower than non-smokers. **False**
29. The difference between whole and parotid saliva is that parotid saliva contains more bacteria. **False**
30. Stimulated saliva tends to be watery because it is primarily the product of the parotid glands. **True**

Multiple Choice (Pick the BEST answer)

31. M cells are critical to the development of mucosal immunity because:
    a. they are macrophages that are critical to antigen presentation to the plasma cells.
    b. they are endothelial cells that are critical to transferring antigen to the O-MALT. **Correct**
    c. they endothelial cells that are critical to the homing process.
    d. they are a type of plasma cell which makes IgM in the D-MALT.
    e. none of the above

32. Homing is the process responsible for:
    a. ensuring that the cytotoxic components of the mucosal system are directed to specific microbial targets.
    b. ensuring that migratory B cells return to the O-MALT after they migrate to the D-MALT.
    c. migration of D-MALT cells to D-MALT. **Correct**
    d. migration of T-cells from the neuroendocrine system to the D-MALT
    e. none of the above

33. Transepithelial transport of secretory IgA is a critical mechanism in secretory immunity because:
    a. It is the mechanism by which sIgA "homes" to O-MALT.
    b. It is the mechanism by which sIgA is converted from monomeric to dimeric.
    c. It is the mechanism by which sIgA is transferred from the plasma cells to the surface of the mucosal tissue. **Correct**
    d. It is the mechanism by which sIgA to transferred from one plasma cell to another.
    e. none of the above.

34. The sialoperoxidase system is regulated by

    a. the production of acid by bacteria.
    b. the presence of thiocyanate ion.
    c. the production of peroxide by bacteria.
    d. all of the above **Correct**
    e. none of the above

35. The non-immune anti-microbial salivary proteins are critical to oral health, even in the presence of a competent mucosal immune system because:

    a. specific antibodies are incapable of inducing an inflammatory reaction.
    b. only the non-immune proteins are capable of inducing an inflammatory reaction.
    c. transepithelial transport of sIgA is not always dependable.
    d. non-immune proteins are always available, while specific antibodies take time to be induced. **Correct**
    e. none of the above

36. It is clear that salivary amylase plays more than a digestive role because:

    a. it is found in tears.
    b. it is found in vaginal secretions.
    c. it is found in colostrum.
    d. all of the above **Correct**
    e. none of the above

37. Restriction endonucleases are the tools that allow the “genetic engineer” to:

    a. restrict transfer of DNA to specific cells.
    b. restrict transcription of DNA to mRNA
    c. cut specific regions of DNA **Correct**
    d. cut specific regions of translated proteins
    e. none of the above

38. The advantages of using viral means of transferring genes to a cell are:

    a. viruses induce inflammatory reactions which enhance gene transfer.
    b. viruses have developed efficient means to transfer their own genetic information to host cells. **Correct**
    c. viruses do not carry the risk of causing other diseases.
    d. viruses rarely induce an immune response that might interfere with gene transfer.
    e. none of the above

39. Resistance to proteolytic activity is important to secretory IgA because:

    a. mucosal tissues may be colonized by highly proteolytic bacterial. **Correct**
    b. the proteases of neutrophils are specific for sIgA.
    c. complement activation that results from sIgA binding antigen may degrade the immunoglobulin.
    d. all of the above
    e. none of the above

40. Which of the following is not an example of receptor-ligand interaction?

    a. antibody-antigen interactions
    b. hormone triggering
    c. acid inhibition of bacterial growth **Correct**
    d. transepithelial transport
    e. all of the above

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

41. Gene transfer therapies offer the potential of restoring activities to tissues that may have lost the ability to produce a product critical to their function. **True**
42. The secretory component is unique in that it is a product of an epithelial cell. **True**
43. One way bacteria have dealt with iron-binding proteins is the production of proteases that degrade these proteins. **True**
44. Sialoperoxidase and myeloperoxidase may both be found in saliva. **True**
45. Hypothiocyanite is more toxic than its protonated form because it is more membrane-permeable. **False**
46. Histatins are quite active against *Candida albicans*, an important fungal pathogen. **True**
47. The ancient "rice test" was probably not an accurate lie detector since there are many reasons that might explain a low salivary flow. **True**
48. The advantage of transferring genes encoding biopharmaceuticals to patients is that the patient will then be able to make his/her own drug for a given disease. **True**
49. The salivary flow rate changes with the time of the day. **True**
50. Use of saliva for drug level monitoring is probably not accurate due to the inherent inability of most drugs to leave the blood vessels and enter the salivary glands. **False**