Histology MCQs/Histological Technique

Today's histological laboratories are usually automated, but main principles are often old.

1 All statemets below are less or more related to the **autolysis**. Which of them is the best?

- ◯ Autolysis is decay of tissues caused mainly by bacteria
- ◯ Autolysis is decay of tissues caused mainly by action of the immune system
- ◯ Autolysis is decay of tissues caused mainly by enzymes produced inside the tissue
- ◯ Autolysis is decay of tissues caused by chemical compounds into which is the sample placed after harvesting

2 **Azokoupling reaction** (azocoupling method) is a proof of enzymatic activity. Which enzyme is usually detected?

- ◯ Alcaline phosphatase
- ◯ Alcoholdehydrogenase
- ◯ Non-specific esterase
- ◯ Horseradish peroxidase

3 Degradation of a biological material caused by bacteria is called:

- ◯ Apoptosis
- ◯ Autolysis
- ◯ Liquefaction
- ◯ Putrefaction

4 How is removed the water out of tissues during common histological processing?

- ◯ We use baths with xylene of subsequently higher and higher concentration
- ◯ We use baths with ethanol of subsequently higher and higher concentration
- ◯ We use baths with acetone of subsequently higher and higher concentration
- ◯ We use baths with benzene of subsequently higher and higher concentration

5 Which compound is proven by **Feulgen's method** (Feulgen's staining)?

- ◯ DNA
- ◯ RNA
- ◯ Proteins
- ◯ Polysaccharides

6 How is called harvesting (collecting) of biological material from deceased?

- ◯ Necropsy
- ◯ Necromancy
- ◯ Necrocomion
- ◯ Material from deceased is not called "biological material"

7 How is called harvesting (collecting) of biological material?

- ◯ Fine needle aspirational biopsy
- ◯ Core cut biopsy
- ◯ Trepanobiopsy
- ◯ Biopsy

8 How thick are usually slices of the sample which are being glued on the underlying slide? *(note: Assume light microscopy only.)*

- ◯ 1 - 10 nm
- ◯ 1 - 2 µm
- ◯ 4 - 10 µm
- ◯ 50 - 100 µm

9 Which type of a microscope has to use laser as a source of light?

- ◯ Confocal microscope
- ◯ Polarisation microscope
- ◯ Phase contrast microscope
- ◯ Scanning electron microscope

10 Which structure is demonstrated (stained) by **luxol blue**?

- ◯ Mucopolysaccharides
- ◯ Phospholipids
- ◯ Glycogen
- ◯ Lipids

11 What is main principle of visualization of **PAS reaction**? (i.e., *"How it works in a nutshell?"*)

- ◯ Purple and insoluble product of reaction of Schiff's reagent with an aldehyde
- ◯ Green and insoluble product of reaction of Schiff's reagent with an aldehyde
- ◯ Purple and insoluble product of reaction of Lugol's reagent with an aldehyde
- ◯ Green and insoluble product of reaction of Lugol's reagent with an aldehydee

12 Which type of chemical interaction is main principle of basic (overview) staining methods?

- ◯ Van der Waals interactions between charged biomolecules and charged molecules of dyes
- ◯ Electrostatic interaction between charged biomolecules and charged molecules of dyes
- ◯ Covalent bonds between charged biomolecules and charged molecules of dyes
- ◯ It depends on the staining technique, different principles can be dominant

13 Among following dyes, only one **is not acidic**. Which one?

- ◯ Eosin
- ◯ Orange G
- ◯ Anilin blue
- ◯ Hematoxylin

14 Which of following dyes **is not** basic?

- ◯ Hematein
- ◯ Orange G
- ◯ Hematoxylin
- ◯ Methylen blue

15 Which macromolecules are proven by **PAS reaction**?

- ◯ RNA
- ◯ DNA
- ◯ Proteins
- ◯ Polysaccharides

16 How is called thechnique which is able to detect specific sequence of nucleic acid on the tissue section?

- ◯ In situ hybridization
- ◯ Lectin histochemistry
- ◯ Immunohistochemistry
- ◯ Feulgen's method

17 Which structure is highlighted using **silver impregnation**?

- ◯ Mukopolysaccharides
- ◯ Reticular fibers
- ◯ Elastic fibers
- ◯ Mucus

18 Which compound is stained by **alcian blue**?

- ◯ Mukopolysaccharides
- ◯ Phospholipids
- ◯ Glycogen

- ◯ Lipids

19 Which cellular structure is stained by **aldehyde fuchsin**?

- ◯ Reticular fibers
- ◯ Polysaccharides
- ◯ Elastic fibers
- ◯ Mucus

20 What stains **orcein**?

- ◯ Reticular fibers
- ◯ Polysaccharides
- ◯ Elastic fibers
- ◯ Mucus

21 **Dyes of Sudan group** are usually used as a staining for:

- ◯ Polysacharides
- ◯ Nucleid acids
- ◯ Proteins
- ◯ Lipids

22 Which basic (overview) staining technique is used the most often?

- ◯ Weigert - Van Gieson
- ◯ Mallory's trichrome
- ◯ Hematoxylin - eosin
- ◯ Masson's trichrome

23 Trichromatic methods (trichromes) are used for visualization of collagen. On which property of collagen is based this staining?

- ◯ Collagen fibers are basophilic
- ◯ Collagen fibers are eosinophilic
- ◯ Collagen fibers are amphiphillic
- ◯ Trichromes cannot be used for this purpose

24 What is main purpose of a cryotome?

- ◯ Slicing of frozen samples
- ◯ Slicing of desicated samples
- ◯ Slicing of samples embedded into water soluble media
- ◯ Slicing of samples embedded into water insoluble media

25 What is it a metachromasia? (i.e., *What does it means a metachromatic staining?*)

- ◯ Metachromatic structure actively repulses molecules of the dye
- ◯ Stained structure has different color than the color of the dye
- ◯ Metachromatic structure actively accumulates molecules of the dye
- ◯ Stained structure reacts chemically with the dye and this reaction changes substantially the chemical nature of the dye

26 What does it mean an **excision**?

- ◯ Surgical removing of part of organ
- ◯ Surgical removing of several organs
- ◯ Brush away free cells from the surface
- ◯ Harvesting of small cylinder of the tissue using a needle

27 What does it mean **mounting of the slide**?

- ◯ Final gluing of the covering slide
- ◯ Gluing of the slice on the underlying slide
- ◯ Covering the block of tissue by the paraffin
- ◯ Labeling of final slide by a bar- or QR code

28 What is it a **diastase reaction**?

- ◯ Modification of PAS reaction based on two slides. One of these slides is pretreated by an enzyme which digest a DNA
- ◯ Modification of PAS reaction based on two slides. One of these slides is pretreated by an enzyme which digest a glycogen
- ◯ Modification of Feulgen's reaction based on two slides. One of these slides is pretreated by an enzyme which digest a DNA
- ◯ Modification of Feulgen's reaction based on two slides. One of these slides is pretreated by an enzyme which digest a glycogen

29 What is it an **indirect methods** of immunohistochemistry?

- ◯ Label is used indirectly
- ◯ Label is bound to the primary antibody
- ◯ Label is bound to the secondary antibody
- ◯ Label is not bound to the primary antibody

30 What is it a **negative control** if the enzyme histochemistry is performed?

- ◯ Result of second staining which is again negative
- ◯ Sample in the workflow which surely lacks the analyzed structure
- ◯ Sample in the workflow which surely contains the analyzed structure
- ◯ Result of second staining which is negative, in contrast to the result of first staining

31 What is it a **positive control** if the enzyme histochemistry is performed?

- ◯ Result of second staining which is again positive
- ◯ Sample in the workflow which surely lacks the analyzed structure
- ◯ Sample in the workflow which surely contains the analyzed structure
- ◯ Result of second staining which is positive, in contrast to the result of first staining

32 What is it a **direct method** in immunohistochemistry?

- ◯ Label is bound to the primary antibody
- ◯ Label is bound to the secondary antibody
- ◯ Label is bound directly to the active site of the antibody
- ◯ Label is bound directly to the structure which should be demonstrated

33 Which structure is the best example of a **basophilic structure**?

- ◯ Ribosomes
- ◯ Mitochondria
- ◯ Lipid droplets
- ◯ Golgi apparatus

34 Which structure is the best example of an **eosinophilic structure**?

- ◯ Ribosomes
- ◯ Cell nucleus
- ◯ Collagen fibers
- ◯ Rough endoplasmic reticulum

35 Which chemical compound is usually main part of **chemical fixatives**?

- ◯ Acetone
- ◯ Formic acid
- ◯ Formaldehyde
- ◯ Osmium tetroxide

36 Which definition of a **fixation** is the best?

- ◯ Freezing of the sample
- ◯ Intense and careful drying up of the tissue
- ◯ Submersion the sample into the fixative fluid
- ◯ Fixation stops gently and quickly activity of enzymes inside the tissue

37 Which embedding medium is the most common?

- ◯ Agar

- ◯ Resin
- ◯ Gelatin
- ◯ Paraffin

38 Which is common color of nuclei after staining with **hematoxylin eosin**?

- ◯ Cherry-like red
- ◯ Blue to magenta
- ◯ Pink to red
- ◯ Pale pink

39 Which is color of the collagen if the **green Masson's trichrome** is used?

- ◯ Yellow
- ◯ Green
- ◯ Blue
- ◯ Red

40 Which is color or the collagen if the **AZAN** is used?

- ◯ Red
- ◯ Blue
- ◯ Green
- ◯ Yellow

41 Which label is the most widely used in immunohistochemistry for the electron microscopy?

- ◯ Hematoxylin
- ◯ Metal particles
- ◯ Enzyme labeling
- ◯ Fluorescent dye

42 Which label is the most widely used in immunohistochemistry for the light microscopy?

- ◯ Enzyme labeling
- ◯ Fluorescent dye
- ◯ Metal particles
- ◯ Hematoxylin

43 Which statement about a histochemistry is the most accurate? (i.e., *"Select the best definition!"*)

- ◯ Histochemistry is an identification and visualization of chemical compounds inside cells and tissues
- ◯ Histochemistry is a measurement of concentration of chemical compounds inside tissues
- ◯ Histochemistry ia an analysis of chemical reaction inside cells
- ◯ Histochemistry is a research method only

44 Which statement about the chemical fixation describes it the best?(i.e., *"Which statement is the most accurate?"*)

- ◯ Chemical fixation can be based on either induction of cross-linking or denaturation
- ◯ Chemical fixation can be performed only if the solution has room temperature
- ◯ Chemical fixation is based on acting of formaldehyde on protein
- ◯ Chemical fixation is used only exceptionally

45 Which statement about the physical fixation describes it the best?

- ◯ Physical fixation is based on cessation of transporting function of water
- ◯ Physical fixation is based on effects of microwave radiation
- ◯ Physical fixation is based on effects of high temperature
- ◯ Physical fixation is based on effects of low temperature

46 Which of following statements describes the **curettage**?

- ◯ Brush away free cells from the the surface of a mucosa
- ◯ Scrape of the tissue using a special tool
- ◯ Surgical removing of whole organ
- ◯ Surgical removing of whole organ

47 Why are histological samples stained?

- ◯ Tissues are colored to chaotically, we have to reduce the number of colors
- ◯ In fact, do dye is used, the term "staining" is a historical mistake
- ◯ Reason is purely aesthetic, true colors of tissues are too ugly
- ◯ Tissues are usually colorless, we have to add some colors

48 Why are trichromatic methods called "trichromatic"?

- ◯ True reason is hidden in history, now it makes no sense
- ◯ There are used three dyes, one basic and two acidic
- ◯ There are used three dyes, all three acidic
- ◯ There are used three dyes

49 Why is AZAN called AZAN?

- ◯ AZAN is an abbreviation of main principule - **AZ**ocoupling **A**nthracite **N**eutralization
- ◯ AZAN is an abbreviation of two main dyes - **AZ**ocarmine and **AN**iline blue
- ◯ AZAN is an abbreviation (from German) - **A**lle **Z**ellen **A**zurblau **N**ichfarbige
- ◯ AZAN is a cool trade name only

50 Why is embedding of fixed sample important? (all statements are correct, select the best one)

- ◯ Embedding increases hardness without increasing the fragility
- ◯ Embedding increases durability of the sample
- ◯ Embedded samples can be easily stored
- ◯ Embedding is a tradition

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