✨FINAL COLLECTED QUESTIONS OF PATHOLOGY 018

1.A 34-year-old male complained of abdominal discomfort. Endoscopy showed a 5mm flat lesion at the gastric antrum (stomach). Histopathologic examination revealed normal looking pancreatic tissue. This lesion is a:

A.Congenital anomaly

B.Hamartoma

C.Benign neoplasm

D.Teratoma

E.Adenoma

2.Which of the following definitions regarding neoplasms is incorrect?

A.Tumor autonomy: ability of tumors to proliferate regardless of normal regulatory mechanisms.

B.Clonality: tumor cells originating from one mutated cell.

C.Sarcoma: Malignant tumor originating from epithelial tissue.

D.Polyp: mass projecting above mucosal surface.

E.Tumor differentiation: The extent to which tumors resemble their cell of origin.

3.Ki 67 is an immunohistochemical stain that stains mitotically active cells. Of the following tumors, which one will show more staining with Ki67?

A.Hamartoma

B.Lipoma

C.Choristoma

D.Adenoma

E.Lymphoma

4.A mass described histologically as: infiltrative and composed of glandular structures lined by pleomorphic cells with prominent nuclei and abnormal mitotic figures is a/an:

A.Adenoma

B.Adenocarcinoma

C.Dysplasia

D.Carcinoma in situ

E.Sarcoma

5.A 45-year-old woman complained of abdominal pain which was thought to be due to appendicitis. During the appendectomy operation, the surgeon noted several masses on the peritoneal surface. The appendix was normal, and no appendiceal masses were seen. Frozen section of the peritoneal lesions showed metastatic carcinoma. The most likely primary site for these metastases is the:

A. Lung

B. Ovary

C. Kidney

D. Brain

E. Liver

6.A cervical biopsy showed immature large cells with hyperchromatic nuclei confined to the lower third of the mucosa. The basement membrane was intact. Which of the following describe the lesion correctly:

A.Neoplastic

B.Innocent and not premalignant

C.Can regress

D.Micro-invasive

E.Carcinoma in situ

7. Which of the following mutation can cause cancer?

A. Decreased BCL2 expression

B. A translocation resulting in downregulation of RAS protein

C. MYC amplification

D. Increased expression of TP53

E. Deletion of a single RB allele

8. Micro RNAs are:

A. Short double stranded segments of nucleic acids

B. Modulate gene expression by increasing DNA mythelation

C. Inhibitors of protein translation

D. Negative regulators of gene expression that work at the transcription level

E. Inhibitors of mRNA formation

9. Tumors can become self-sufficient in growth signals through all of the following mechanisms except:

A.Increased expression of Cyclin Dependent Kinase 4

B.Increased Cyclin D expression

C.RAF over-expression

D.Increased GTPase

E.ABL-BRC translocation

10.WNT signalling pathway causes:

A.Destruction of APC

B.Beta catenin activation

C.Stimulation of beta catenin destruction complex

D.Increased E cadherin expression

E.Downregulation of SLUG/SNAIL genes

11. A 55-year-old man had increasing fatigue for the past 6 months. Laboratory studies show a WBC count of 189,000/microliter. The peripheral blood smear shows many mature and immature myeloid cells present. Cytogenetic analysis of cells obtained via bone marrow aspiration reveals a t (9:22) translocation. This translocation leads to formation of a hybrid gene that causes cancer through which of the following mechanisms?

A. Downregulation of p53

B. Increased activity of tyrosine kinase

C. Downregulation of ABL gene

D. Increased cyclin D activity

E. MYC amplification

12. Choose the correct statement regarding RB gene:

A. To cause cancer, both copies of the RB gene must be deleted in germ cells; somatic mutations are incapable of causing cancer

B. The protein product of the RB gene is stimulated via gaining more phosphate groups

C. Normal RB causes arrest of cell cycle at the G2/M phase

D. HPV can cause cancer by binding to and functionally deleting RB

E. RB acts via binding to and inhibiting the transcription of cyclin B

13.All of the following statements are correct regarding tumours' changes in metabolism except:

A.Warburg metabolism ensures obtaining the maximum energy from each mole of glucose consumed.

B.Warburg effect is utilised clinically in PET scan.

C.IDH mutations result in oncometabolites that cause epigenetic changes leading to carcinogenesis.

D.Autophagy is used by tumour cells during chemotherapy treatment to aid survival.

E.Warburg effect is facilitated by overactivation of oncogenes and downregulation of tumour suppressor genes

14.Which of the following statements is incorrect regarding epithelial- mesenchymal transition (EMT) in neoplasia?

A. EMT is a process aiming at acquiring a phenotype that permits increased motility of cells.

B. SLUG and SNAIL transcription factors are downregulated in this process.

C. E cadherin is downregulated

D. EMT is essential for tumor invasion and metastasis

E. Cells acquire actin filaments during EMT.

15.Which of the following statements is incorrect regarding P53:

A.When phosphorylated it inhibits Rb protein causing cell cycle arrest.

B.Is inhibited by binding to HPV

C.During hypoxia p53 induces DNA repair and causes cell senescence

D.Mutated p53 enables malignancy by increasing the chance of accumulation of other genetic mutations.

E. Patients with Li-Fraumeni syndrome inherit a mutated copy of P53.

16. Around 20% of breast carcinomas can be treated by Herceptin ; an antibody therapy targeting HER2/NEU gene product which is a

A.Growth factor

B.Growth factor receptor

C.Transcription factor

D.MiRNA

E.Growth inhibitor

17.A 37-year-old female developed right sided colon cancer. She has family history of colon cancer. Examining her colon showed a 4 cm tumor and numerous polyps. The most likely mutated gene in her case is

A.APC

B. Beta catenin

C.E cadherin

D. Mismatch repair gene

E.ATM

18.A normal fibroblast can divide up to 70 times. In a fibrosarcoma, malignant fibrous cells still can divide after the 80th division. Which of the following genes is activated to acquire this ability?

A.Telomearse gene

B.Mismatch repair gene

C.Merlin gene

D.TWIST gene

E.Microsatellite instability gene

19.Malignant cells can evade apoptosis by which of the following mechanisms?

A. Increased FADD protein

B. Increased FLIP protein

C. Increased mitochondrial permeability

D. Decreased bcl2

E. Decreased IPA

20.TP53 deletion or inactivation mutation results in:

A.Increased Thrombospondin

B.Increased proapoptotic proteins

C.Decreased micro RNA against bcl2

D.Increased expression of DNA repair genes

E.Increased hypoxia

21.A 47-year-old man presented with abdominal pain. Colonoscopy revealed a 7 cm tumor which on histological examination was a poorly differentiated adenocarcinoma. He has lymph node metastases and liver and lung nodules. Which of the following statements regarding his tumor's stage and grade is correct:

A.T stage is determined by the size of his tumor

B .His N stage is considered N0

C. The poor differentiation is irrelevant to the stage

D. He has a grade 2 tumor

E. The 5-year survival of his tumor exceeds 90%

22.Which of the following cells doesn't play a role in immunosurveillance?

A.Natural killer cells

B.Plasma cell

C.M1 macrophage

D.T helper lymphocyte

E.Cytotoxic T lymphocyte

23.Inherited skin cancer due to ultraviolet light is caused by a mutation in:

A.RAS gene

B.BRCA 1 gene

C. Recombination repair genes

D.TP53 gene

E. Nucleotide excision repair genes

24.Hypercalcemia is considered a para-neoplastic syndrome in a patient with which of the following conditions?

A.parathyroid adenoma

B.T2 N2 M1 breast cancer metastasizing to the bone

C.T2 N1 M0 lung cancer

D.Bone sarcoma

E.parathyroid carcinoma

25.Malignant cells can suppress host immunity by:

A.CEA

B. alpha fetoprotein

C.TGF beta

D.IL 1

E. Mucin

26.Tumor cells can avoid being killed by cytotoxic T cells by expressing:

A.PDL1

B.CEA

C.TNF

D.MUC 17

E.HIF

27.A surgeon performing a mastectomy on a 55-year-old lady for breast carcinoma wanted to examine her lymph nodes to decide to remove them or not. He needs the answer during the operation; the best method to procced is with:

A.Fine needle aspiration of the lymph node

B.Frozen section of the lymph node

C.Excisional biopsy of the lymph node

D.Blood test for serum markers

E.Cytology smear

28.A 65 year old woman has breast cancer that metastasized to the bone. She has no family history of breast cancer. The least likely mutated gene in her case is:

A.RAS

B.TP53

C.BRCA 1

D.E cadherin

E.SLUG/SNAIL

29.A testicular mass composed of a cyst lined by respiratory type epithelium is a:

A. Hamartmoa

B. Teratoma

C. Choristoma

D. Adenoma

E. Seminoma

30.Choose the incorrect combination:

A.H pylori and gastric carcinoma

B.HPV and cervical carcinoma

C.HTLV1 and B cell lymphoma

D. Aphlatoxin B and hepatocellular carcinoma

E.H pylori and gastric lymphoma

31. Which one of the following is correct about necrosis:

A. shrinkage of the cell

B. prominent inflammation

C. fragmentation of the nucleus into nucleosome size fragments

D. intact plasma membrane

E. controlled

32. One of the following factors induce notch signalling and sprouting:

A. VEGF

B. TGF-ß

C. TNF

D. IL-1

E. IL-2

33. Brain necrosis:

A. coagulative

B. gangrenous

C. fat

D. caseous

E. liquefactive

34. A patient with a cast, best described:

A. dysplasia

B. hypertrophy

C. atrophy

D. metaplasia

E. hyperplasia

35. What's true about TGF-β :
A. important fibrogenic factor

B. responsible about sprouting

C. has no role in repairing

D. produced by neutrophils only

E. has no importance in tumors

36. Found in mature scars:

A. cross linked collagen 1
B. Granulation tissue
C. a lot of thin-walled capillaries
D. collagen 3 only

E. collagen 2 only

37. A 70 year old man with emphysema, his weight is 150 kg, will undergo abdominal surgery for large small bowel mass, the best description for the case:

A. there's no risk

B. complicated surgery with high risks that needs hospitalization

C. very easy surgery, Assure him

D. there might be some risk, not too complicated

E. very high risk, and he might die, advise him not to do it

38. What mediates fibrogenesis and ECM deposition:

A. TNF

B. IF-γ

C. TGF beta

D. Nitric oxide

39. Which of the following will accumulate in the case of brown atrophy:

A. calcium

B. Hemosiderin

C. Melanin

D. lipofuscin

40. Mediator of initial inflammatory response:

A. Selectins

B.TLR

C. IL-10

D. Collagen

41. The following picture is:

A. keloid scar

B. Arterial ulcer

C. Hypertrophic scar

D. Diabetic ulcer

42. Which of the following is true about bed ulcers:

A. Always fatal

B. Impossible to deal with

C. preventable

D. Appear as an intact epithelial surface under the microscope

43.One of the following is considered a feature of acute inflammation:

A. mediated by lymphocytes

B. slow onset

C. prominent signs

D. Sever and progressive

E. No signs and symptoms

44. Which one of the following is considered a stable tissue :

A. skeletal muscle

B. liver

C. skin

D. cardiac muscle

E. bone marrow

45. Secondary repair -compared with initial repair- has:

A. more scar and more tissue injury

B. always associated with tissue granuloma

C. very small tissue lost

D. maintained function of the repaired tissue

46.One of the following sentences is correct :

A. Tissues with better blood supply heal more slowly

B. Healing process is affected by one factor only

C. Taking steroid drugs will delay tissue repair

D. The presence of foreign bodies enhances repair process

47. this picture is:

A. Deep ulcer with atherosclerosis

B. non healing gangrene with fungal infection

C. Wound dehiscense

D. Inflamed leg with dilated blood vessels

48-The main cause of alzheimer's disease is:

A. Misfolded proteins

B. DNA damage

C. Toxin

D. Reactive oxygen species

49-A patient suffers from a tender polyp in teeth with yellow liquid, the most accurate sentence is:

A. can be treated with antibiotics since it's a bacterial infection

B. inflammation with abscess

C. A defect of the mucosal surface

D. Involves transudate fluid

50-A patient with RA have been under a long period steroids therapy, suffering from shortness of breath & fever, X rays shows a bilateral lung infiltration, diagnosis of the case:

A. opportunistic lung infection

B. Staphylococcal pneumonia

C. Asthma

D. squamous cell carcinona

✦ANSWERS:-

1) A	16) B	31) B	46) C
2) C	17) A	32) A	47) A
3) E	18) A	33) E	48) A
4) B	19) B	34) C	49) B
5) B	20) C	35) A	50) A
6) C	21) C	36) A	
7) C	22) B	37) B	
8) C	23) E	38) C	
9) D	24) C	39) D	
10) B	25) C	40) B	
11) B	26) A	41) A	
12) D	27) B	42) C	
13) A	28) C	43) C	
14) B	29) B	44) B	
15) A	30) C	45) A	

SAMIA SAMI 💙

NANCY AL-JOULANI 💜

مَن رضي بالله مدبّراً،أحاطه باللطف من كُل جانب.✨

Intro to pathology, neoplasia,20/21.
Heyam Awad

1. A 55-year-old male, a heavy smoker, developed a squamous cell carcinoma of the right lower lobe of the lung. Which of the following is the most likely precursor (premalignant lesion) of his cancer?
   A. Severe dysplasia of the respiratory epithelium. Respiratory epithelium is glandular. Dysplasia in glandular epithelium can progress to adenocarcinoma, not squamous.
   B. **Moderate dysplasia of metaplastic squamous epithelium. Squamous cancer originates only from squamous epithelium**
   C. Mild dysplasia of goblet cells. Goblet cells are glandular cells
   D. Reactive hyperplasia of the bronchial mucosa. Hyperplasia is a reactive process and bronchial mucosa is glandular.
   E. Carcinoma in situ of the pseudostratified columnar epithelium. Columnar progresses to adenocarcinoma not squamous.

2. A well circumscribed lesion composed of well differentiated fibroblasts with no cellular pleomorphism or hyperchromatic nuclei is a: we are describing a benign tumor originating from fibroblasts, so it is :
   A. **Fibroma**
   B. Fibrosarcoma
   C. Fibrocarcinoma
   D. Hamartoma
   E. Choristoma

3. A mass composed of normal looking pancreatic tissue present in the wall of the stomach is a: normal tissue in an abnormal location = choristoma
   a. Teratoma
   b. Hamartoma
   c. **Congenital anomaly; choristomas are congenital anomalies, not true neoplasms.**
   d. Benign neoplasm: no, they are not neoplastic
   e. Premalignant lesion

4. Which of the following tumors can metastasize? Here I'm asking about the malignant OMA (the exceptions)
   a. **Melanoma**
   b. Lipoma
   c. Adenoma
   d. fibroma
   e. choristoma

5. A malignant tumor of the stomach is composed of glandular structures that look morphologically very similar to the normal gastric gland is a : here I'm asking about differentiation; well differentiated tumors = grade 1 look similar to the cell of origin.
   a. Grade 3 adenocarcinoma
   b. Stage 3 adenocarcinoma
   c. **Grade 1 adenocarcinoma**
   d. Stage 1 adenocarcinoma: stage refers to extent of spread not morphology
   e. Adenocarcinoma which can be of any grade or stage.

6. One of the following is not a feature of dysplasia:
   a. Can regress if it is mild. Correct
   b. Can progress to cancer even if it is mild.Correct
   c. It is not neoplastic Correct
   d. Abnormal mitosis is a histologic feature correct
   e. **Nucleocytoplasmic ratio is preserved, no, N/C ratio is increased.**

7. Sarcomas usually metastasize through: this is a straightforward question
   A. **Blood vessels**
   B. Lymphatics
   C. Peritoneal seedings
   D. Needle tracts and surgical operations
   E. They do not metastasize

8. All of the following mutations can cause cancer except:
   a. deletion of both TP53 alleles, yes, and both must be deleted as it is a tumor supressor gene
   b. overexpression of a single RAS allele, yes, one allele is enough because this is an oncogene
   c. **amplification of both RB alleles. Wrong, RB is tumor suppressor so to cause cancer the genes must be deleted or inhibited.**
   d. ABL-BCR translocation correct
   e. Overexpression of a single EGFR allele, correct

9 .MIB 1 is an immunohistochemical stain used to highlight mitotically active cells. Of the following tumors, which one will show low staining with MIB 1? Here I am asking which of the following is benign because rate of growth (as judged by mitotic activity) is slow in benign tumors
A. **teratoma**
B. Liposarcoma
C. grade 3 adenocarcinoma
D. seminoma
E. Lymphoma

10 .Micro RNAs are:
A. Short double stranded segments of nucleic acids. No, they are single stranded
B. Modulate gene expression by increasing DNA mythelation, no they affect posttranscription of proteins
C**. Inhibitors of protein translation, correct**
D. Negative regulators of gene expression that work at the transcription level, **no they work at posttranscriptional level**
E. Inhibitors of mRNA formation, no, they do not mRNA formation (don't affect transcription)

11. which of the following statements is **correct** regarding tumours' changes in metabolism ?
A. Warburg metabolism ensures obtaining the maximum energy from each mole of glucose consumed. No, they get less energy but more carbon atoms
B. metabolic switch to aerobic glycolysis is enhanced by oncogene overexpression correct, and by inhibition of tumor suppressor genes also.
C. IDH mutations result in oncometabolites that cause changes in micro RNAs leading to carcinogenesis. No they affect mythelation and cause epigenetic changes.
D. Autophagy in tumor cells is inhibited during chemotherapy treatment. stimulated
E. Warburg effect is facilitated by overactivation of tumor suppressor genes.no, by decreased tumor suppressor genes

12. Which of the following statements is incorrect regarding epithelial- mesenchymal transition (EMT) in neoplasia?
A. EMT is a process aiming at acquiring a phenotype that permits increased motility of cells.
B. SLUG and SNAIL transcription factors are downregulated in this process. They are stimulated of course.
C. E cadherin is downregulated.
D. EMT is essential for tumor invasion and metastasis
E. Cells acquire actin filaments during EMT.

13. Which of the following statements is incorrect regarding P53: This question will be deleed. It has 2 answers. Sorry for that.
A. **When phosphorylated it inhibits Rb protein causing cell cycle arrest**. It actually stimulates RB.
B. Is inhibited by binding to HPV. correct
C. During hypoxia p53 induces DNA repair and inhibits cell senescence, wrong, it stimulates senescence
D. Mutated p53 enables malignancy by increases the chance of accumulation of other genetic mutations. correct
E. Patients with Li-Fraumeni syndrome inherit a mutated copy of P53. correct

14. A 37-year-old female developed right sided colon cancer. She has family history of colon cancer. Examining her colon showed a 4 cm tumor and numerous polyps. She has a genetic mutation that results in stimulation of which of the following proteins? She has FAP syndrome due to APC deletion. This APC deletion stimulated Beta catenin (no destruction complex is formed)
A. APC: this is the underlying mutation but the question asks about the stimulated protein as a result of this mutation.
B. **Beta catenin**
C. E cadherin: this actually decreases , when beta catenin is stimulated it increase SLUG/SNAIL which decrease E cadherin and facilitate metastasis.
D. Mismatch repair gene
E. ATM

15. A normal fibroblast can divide up to 70 times. In a fibrosarcoma, malignant fibrous cells still can divide after the 80th division. Which of the following genes is activated to acquire this ability? this is easy!
A. **Telomerase gene**
B. Mismatch repair gene
C. Merlin gene
D. TWIST gene
E. Microsatellite instability gene

16. Malignant cells can evade apoptosis by which of the following mechanisms? straightforward
A. Increased FADD protein
B. **Increased FLIP protein**
C. Increased mitochondrial permeability
D. Decreased bcl2
E. Decreased IPA

17. TP53 deletion or inactivation mutation results in: also straightforward
A. Increased Thrombospondin
B. Increased proapoptotic proteins
C. **aerobic glycolysis switch**
D. Increased expression of DNA repair genes
E. Increased hypoxia

18. A 47-year-old man presented with abdominal pain. Colonoscopy revealed a 7 cm tumor which on histological examination was a poorly differentiated adenocarcinoma. His lymph nodes were normal and imaging studies didn't show any metastases. Which of the following statements regarding his tumor's stage and grade is **incorrect:**
A. **T stage is determined by the size of his tumor**. Size has nothing to do with the stage in colon cancer. T in hollow organs (with lumen and wall) is determined by extent of wall invasion)
B. His N stage is considered N0. Correct. Normal lymph nodes= no lymph node involvement, so N stage is N0.

C. The poor differentiation is irrelevant to the stage**.** Correct, differentiation determines the grade not the stage
D. He has a grade 3 tumor. Correct, poor differentiation= grade 3
E. The 5-year survival of his tumor is expected to be better than that of another patient with distant mutases. Correct, the patient has no metastasis (M0). The presence of metastasis is the most important factor to determine survival.

19. Which of the following cells doesn't play a role in immunosurveillance? easy
A. Natural killer cells
B. **Plasma cell**
C. M1 macrophage
D. T helper lymphocyte
E. Cytotoxic T lymphocyte

20. Inherited skin cancer due to ultraviolet light is caused by a mutation in: easy
A. RAS gene
B. BRCA 1 gene
C. Recombination repair genes
D. TP53 gene
E. **Nucleotide excision repair genes.**

21. Hypercalcemia is considered a para-neoplastic syndrome in which of the following tumors?
A. parathyroid carcinoma, no because parathyroid normally secretes a hormone that causes hypercalcemia.
B. T2 N2 M1 breast cancer metastasizing to the bone. No, bone metastases can destroy bone and release calcium inside bone.
C. **T2 N1 M0 colon cancer, yes, normally the colon has nothing to do with calcium and since it is M0 then there is no metastasis to explain the hypercalcemia.**
D. Bone sarcoma. No, bone destruction due to the sarcoma can cause hypercalcemia.
E. Any tumor secreting parathyroid hormone, no, if the secretion is endogenous to the site (normally secreted) so it is not paraneopastic.

22. Malignant cells can suppress host immunity by: easy
A. CEA
B. alpha fetoprotein
C**. TGF beta**
D. IL 1
E. Mucin

23. A surgeon performing a mastectomy on a 55-year-old lady for breast carcinoma wanted to examine her lymph nodes to decide to remove them or not. He needs the answer during the operation; the best method to procced is with:
A. Fine needle aspiration of the lymph node
B. **Frozen section of the lymph node: this is done during operations**
C. Excisional biopsy of the lymph node
D. Blood test for serum markers
E. Cytology smear

24. A 65 year old woman has breast cancer that metastasized to the bone. She has no family history of breast cancer. The least likely mutated gene in her case is:
A. RAS
B. TP53
C. **BRCA 1 this is rare in sporadic breast cancer**
D. E cadherin
E. SLUG/SNAIL

25. Choose the incorrect combination:
A. H pylori and gastric carcinoma
B. HPV and nasopharyngeal carcinoma
C. EBV and T cell lymphoma
D. **Aphlatoxin B and pancreaticcarcinoma**: this causes hepatocellular carcinoma
E. HTLV1 and T cell lymphoma

26. A gastric carcinoma was found to grow in individual cell pattern with no glandular formation. Which of the following mutations s responsible for this morphology?
A. **E cadherin loss: this is responsible for adhesion, when lost tumors grow in an individual cell fashion.**
B. APC loss
C. MYC overexpression

D. SLUG/SNAIL inactivation: Note that SLUG/SNAIL activation decreases e cadherin. Their inactivation might increase it.
E. TP53 deletion

27.which of the following chemical agents can cause cancer without metabolic conversion? DIRECT ACTING
A. **Chemotherapy drugs**
B. polycyclic hydrocarbons
C. aromatic amines
D. nitrites
E. Aphlatoxin B

28. Which of the following definitions regarding neoplasms is **incorrect**?
A. Tumor autonomy: ability of tumors to proliferate regardless of normal regulatory mechanisms.
B. Clonality: tumor cells originating from one mutated cell.
C. Sarcoma: Malignant tumor originating from mesenchymal tissue**.**
D. **Tumor dormancy: rapidly proliferating tumor cells that cause recurrence after several years of removal of the primary tumor. They are dormant= non- dividing**
E. Tumor differentiation: The extent to which tumors resemble their cell of origin.

29. A year old man found to have a 3 cm colonic mass. Microscopic examination of the tumor revealed a poorly differentiated adenocarcinoma with areas of necrosis.
What is the most important staging factor in this patient? easy
A. Histologic grade
B. Presence of tumor necrosis
C. Presence of distant metastasis: this is alywas the most important factor.
D. Absence of tumor capsule
E. Number of mitotic figures

30. A 2GRADElipo year old boy was diagnosed with inherited form of retinoblastoma which is caused by homozygous loss of Rb gene. The main function of this tumor suppressor gene is: easy
A. Inhibition of activation of cyclin E/CDK2 complex
B. Inhibition of apoptotic genes
C. Activation of cytochrome c release
D. Activation of caspase 8
E. Activation of cytoplasmic kinases

31. Neurofibrumin 1 is a GAP (GTPase activating protein) . Inactivation mutations in this protein case cancer by activating which of following: easy
A. ABL
B. ALK
C. **RAS**
D. BCL2
E. P53

Introduction to Pathology/ neoplasia/ 2020/ Dr Heyam Awad

1. A 34-year-old male complained of abdominal discomfort. Endoscopy showed a 5mm flat lesion at the gastric antrum (stomach). Histopathologic examination revealed normal looking pancreatic tissue. This lesion is a: This is a choristoma, and choristomas are congenital anomalies

A. **Congenital anomaly.**

B. Hamartoma

C. Benign neoplasm. Note that choristomas are not true neoplasms

D. Teratoma

E. Adenoma

2. Which of the following definitions regarding neoplasms is incorrect?

A. Tumor autonomy: ability of tumors to proliferate regardless of normal regulatory mechanisms.

B. Clonality: tumor cells originating from one mutated cell.

C. **Sarcoma: Malignant tumor originating from epithelial tissue. No, sarcomas are of stromal/mesenchymal origin.**

D. Polyp: mass projecting above mucosal surface.

E. Tumor differentiation: The extent to which tumors resemble their cell of origin.

3. Ki 67 is an immunohistochemical stain that stains mitotically active cells. Of the following tumors, which one will show more staining with Ki67? The idea of this question is that rate of mitosis (division) is more in malignant tumors.

A. Hamartoma

B. Lipoma

C. Choristoma

D. Adenoma

E. **Lymphoma**

4. A mass described histologically as: infiltrative and composed of glandular structures lined by pleomorphic cells with prominent nuclei and abnormal mitotic figures is a/an: infiltrative means malignant and the presence of glandular structures means an adenocarcinoma.

A. Adenoma

B. **Adenocarcinoma**

C. Dysplasia

D. Carcinoma in situ

E. Sarcoma

5. A 45-year-old woman complained of abdominal pain which was thought to be due to appendicitis. During the appendectomy operation, the surgeon noted several masses on the peritoneal surface. The appendix was normal, and no appendiceal masses were seen. Frozen section of the peritoneal lesions showed metastatic carcinoma. The most likely primary site for these metastases is the: peritoneal spread occurs in tumors originating in organs exposed to the peritoneal cavity; mainly appendix and ovary.

A. Lung

B. **Ovary**

C. Kidney

D. Brain

E. Liver

6. A cervical biopsy showed immature large cells with hyperchromatic nuclei confined to the lower third of the mucosa. The basement membrane was intact. Which of the following describe the lesion correctly: this describes moderate dysplasia

A. Neoplastic; dysplasia is not neoplastic

B. Innocent and not premalignant

C. **Can regress**

D. Micro-invasive

E. Carcinoma in situ

7. Which of the following mutation can cause cancer?

A. Decreased BCL2 expression

B. A translocation resulting in downregulation of RAS protein

C. **MYC amplification**

D. Increased expression of TP53

E. Deletion of a single RB allele. Both alleles need to be lost to cause cancer.

8. Micro RNAs are:

A. Short double stranded segments of nucleic acids. They are single stranded

B. Modulate gene expression by increasing DNA mythelation. Wrong, they do not affect transcription by any means.

C. **Inhibitors of protein translation: correct, this is done through degradation of mRNA or inhibition of translation**

D. Negative regulators of gene expression that work at the transcription level

E. Inhibitors of mRNA formation: wrong, mRNA is formed, but is degraded later.

9. Tumors can become self-sufficient in growth signals through all of the following mechanisms except:

A. Increased expression of Cyclin Dependent Kinase 4.

B. Increased Cyclin D expression

C. RAF over-expression

D. **Increased GTPase: on the contrary, this will inhibit ras so will decrease growth**

E. ABL-BRC translocation

10. A 55-year-old man had increasing fatigue for the past 6 months. Laboratory studies show a WBC count of 189,000/microliter. The peripheral blood smear shows many mature and immature myeloid cells present. Cytogenetic analysis of cells obtained via bone marrow aspiration reveals a t (9:22) translocation. This translocation leads to formation of a hybrid gene that causes cancer through which of the following mechanisms? This is straightforward and very easy.

A. Downregulation of p53

B. **Increased activity of tyrosine kinase**

C. Downregulation of ABL gene

D. Increased cyclin D activity

E. MYC amplification

11. Choose the correct statement regarding RB gene:

A. To cause cancer, both copies of the RB gene must be deleted in germ cells; somatic mutations are incapable of causing cancer. Wrong, both copies need to be deleted, either in an inherited or acquired manner.

B. The protein product of the RB gene is stimulated via gaining more phosphate groups. No, Rb is stimulated by hyophosphorylation

C. Normal RB causes arrest of cell cycle at the G2/M phase. No, at G1/S phase

D. **HPV can cause cancer by binding to and functionally deleting RB.**

E. RB acts via binding to and inhibiting the transcription of cyclin B. no, cyclin E

12. All of the following statements are correct regarding tumours' changes in metabolism except:

A. Warburg metabolism ensures obtaining the maximum energy from each mole of glucose consumed. No, maximum carbon atoms but less energy.

B. Warburg effect is utilised clinically in PET scan.

C. IDH mutations result in oncometabolites that cause epigenetic changes leading to carcinogenesis.

D. Autophagy is used by tumour cells during chemotherapy treatment to aid survival.

E. Warburg effect is facilitated by overactivation of oncogenes and downregulation of tumour suppressor genes

13. Which of the following statements is incorrect regarding epithelial- mesenchymal transition (EMT) in neoplasia?

A. EMT is a process aiming at acquiring a phenotype that permits increased motility of cells.

B. SLUG and SNAIL transcription factors are downregulated in this process. Definitely wrong, they are the most important genes in EMT and metastasis.

C. E cadherin is downregulated

D. EMT is essential for tumor invasion and metastasis

E. Cells acquire actin filaments during EMT.

14. Which of the following statements is incorrect regarding P53:

A. When phosphorylated it inhibits Rb protein causing cell cycle arrest. Wrong, it stimulates RB, stimulated Rb causes cell cycle arrest.

B. Is inhibited by binding to HPV

C. During hypoxia p53 induces DNA repair and causes cell senescence

D. Mutated p53 enables malignancy by increasing the chance of accumulation of other genetic mutations.

E. Patients with Li-Fraumeni syndrome inherit a mutated copy of P53.

15. Around 20% of breast carcinomas can be treated by Herceptin ; an antibody therapy targeting HER2/NEU gene product which is a : this is easy
A. Growth factor
B. **Growth factor receptor**
C. Transcription factor
D. MiRNA
E. Growth inhibitor

16. A 37-year-old female developed right sided colon cancer. She has family history of colon cancer. Examining her colon showed a 4 cm tumor and numerous polyps. The most likely mutated gene in her case is: she has familial adenomatous polyposis.
A. **APC**
B. Beta catenin
C. E cadherin
D. Mismatch repair gene
E. ATM

17. WNT signalling pathway causes:
A. Destruction of APC
B. **Beta catenin activation**
C. Stimulation of beta catenin destruction complex
D. Increased E cadherin expression
E. Downregulation of SLUG/SNAIL genes

18. A normal fibroblast can divide up to 70 times. In a fibrosarcoma, malignant fibrous cells still can divide after the 80^{th} division. Which of the following genes is activated to acquire this ability? Ability to divide beyond the normal limit
A. **Telomearse gene**
B. Mismatch repair gene
C. Merlin gene
D. TWIST gene
E. Microsatellite instability gene

19. Malignant cells can evade apoptosis by which of the following mechanisms?
A. Increased FADD protein
B. **Increased FLIP protein**
C. Increased mitochondrial permeability
D. Decreased bcl2
E. Decreased IPA

20. TP53 deletion or inactivation mutation results in:
A. Increased Thrombospondin
B. Increased proapoptotic proteins
C. **Decreased micro RNA against bcl2**

D. Increased expression of DNA repair genes
E. Increased hypoxia

21. A 47-year-old man presented with abdominal pain. Colonoscopy revealed a 7 cm tumor which on histological examination was a poorly differentiated adenocarcinoma. He has lymph node metastases and liver and lung nodules. Which of the following statements regarding his tumor's stage and grade is correct:
A. T stage is determined by the size of his tumor. No, size is irrelevant in tumors originating in mucosal surfaces lining cavities.

B. His N stage is considered N0. Of course not

C. **The poor differentiation is irrelevant to the stage.** **Correct, differentiation is related to grade not stage,**

D. He has a grade 2 tumor. poor differentiation is grade 3

E. The 5-year survival of his tumor exceeds 90%. This is a metastatic tumor so it is stage 4, this has a poor prognosis

22. Which of the following cells doesn't play a role in immunosurveillance?

A. Natural killer cells

B. **Plasma cell:** **humoral immunity doesn't play a role in immunosurveillance.**

C. M1 macrophage

D. T helper lymphocyte

E. Cytotoxic T lymphocyte

23. Inherited skin cancer due to ultraviolet light is caused by a mutation in:

A. RAS gene

B. BRCA 1 gene

C. Recombination repair genes

D. TP53 gene

E. **Nucleotide excision repair genes.** **This is mutated in xeroderma pigmentosa**

24. Hypercalcemia is considered a para-neoplastic syndrome in a patient with which of the following conditions?

A. parathyroid adenoma, no because hypercalcemia can be explained by hormonal production indigenous to the tumor site.

B. T2 N2 M1 breast cancer metastasizing to the bone, no, met to bone can explain the high calcium

C. **T2 N1 M0 lung cancer. Here high calcium cannot be explained by primary site (lung) and there is no metastasis (M0) so we have a symptom not explained by the primary or metastatic site; this is the definition of paraneoplastic syndrome.**

D. Bone sarcoma, primary bone tumor, so calcium stored in bone can be released, so hypercalcemia can be explained by the primary tumor site

E. parathyroid carcinoma, same explanation as A

25. Malignant cells can suppress host immunity by:

A. CEA

B. alpha fetoprotein

C**. TGF beta**

D. IL 1

E. Mucin

26. Tumor cells can avoid being killed by cytotoxic T cells by expressing:

A. **PDL1**

B. CEA

C. TNF

D. MUC 17

E. HIF

27. A surgeon performing a mastectomy on a 55-year-old lady for breast carcinoma wanted to examine her lymph nodes to decide to remove them or not. He needs the answer during the operation; the best method to procced is with:

A. Fine needle aspiration of the lymph node

B. **Frozen section of the lymph node. This is an intra-operative diagnostic procedure.**

C. Excisional biopsy of the lymph node

D. Blood test for serum markers

E. Cytology smear

28. A 65 year old woman has breast cancer that metastasized to the bone. She has no family history of breast cancer. The least likely mutated gene in her case is:

A. RAS

B. TP53

C. **BRCA 1: this gene mutation is common in inherited but not sporadic breast cancer.**

D. E cadherin

E. SLUG/SNAIL

29. A testicular mass composed of a cyst lined by respiratory type epithelium is a:

A. Hamartmoa

B. **Teratoma**

C. Choristoma: this is not a choristoma because it is a cyst, cysts are not normal.. and choristomas are completely normal tissue in an abnormal location.

D. Adenoma

E. Seminoma

30. Choose the incorrect combination:

A. H pylori and gastric carcinoma

B. HPV and cervical carcinoma

C. **HTLV1 and B cell lymphoma: HTLV1 causes T cell lymphoma.**

D. Aphlatoxin B and hepatocellular carcinoma

E. H pylori and gastric lymphoma.

22) All of the following can keep the cell in G1 phase , except:

a- P53
b- RB
c- CDKI
d- Cyclin D
e- E2F inhibition

Answer: D

20) True about miRNA :

a- If it's increased for RB will result in cancer

15) Which one of these is least likely to be mutated in a woman with sporadic breast cancer :

a- BRCA

16) A toxin present in cigarette smoke and can cause lung cancer :

a- Beta naphthalamine
b- Benzo pyrene
c- Nitrites
d- Aflatoxin B

Answer: B

17) Most important prognostic stage is :

a- Presence of metastisis

18) Brown atrophy caused by :

a- Lipofuscin

19) Breast cancer mass , the mass removed and sent to histopathologist what is the most indicator for malignancy :

a- Atypical mitosis

10) A 48 year old woman goes to her physician for a routine physical examination . A 4 cm diameter non tender mass is palpated in her right breast. The mass appears fixed to the chest wall.another 2 cm nom tender mass is palpable in the left axilla. Which of the following classification best indicates the stage of her disease:

A- T1 N1 M0
B- T1 N0 M1
C- T2 N1 M0
D- T3 N0 M0
E- T4 N1 M1

Answer: E

11) Cancer induced by papilloma virus 16 and 18:

a- T cell lymphoma
b- Squamous cell carcinoma of the cervix
c- Gastric carcinoma
d- Burkitt lymphoma
e- Hodgkin lymphoma

Answer: B

12) Jordan has high rates of colonal cancer, which of the following would be the best to avoid it :

a- Screening for dysplasia

13) This gene is mutated in xeroderma pigmentation:

a- Nucleotide excision repair gene
b- P53 degradation
c- BRCA 1

Answer: A

1) Which of the following is an oncofetal protein:

a- CEA
b- PSA
c- GF beta
d- MYC
e- RAS

Answer: A

2) A normal fibroblast can divide up to 70 times. In a fibrosarcoma, fibrous cells can divide after the 80^{th} division. The gene that is activated to acquire this ability is normally expressed in:

a- Mature fibroblasts
b- Labile tissue
c- Embryonal cells
d- Quiescent tissue
e- Cells in the M phase of cell cycle

Answer: C