Biochem-FMT BTR test 2.0

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1. A family consumes only polished rice. Which of the following combination of vitamin deficiency and enzymatic defect will be present in this family?

A. Riboflavin - Glutathione Reductase
B. Thiamine - Transketolase
C. Thiamine - Transaminase
D. Riboflavin – Transketolase

2. A 49-year-old man comes to the emergency department with severe shortness of breath. The patient has a history of hypertension and medication nonadherence. Blood pressure is 260/144 mm Hg and pulse is 100/min. Chest examination demonstrates bibasilar crackles. Intravenous furosemide and continuous nitroprusside infusion are started, along with noninvasive positive pressure ventilation, and he experiences improvement in his symptoms. The next morning, the patient is confused and lethargic, and he suffers a generalized tonic-clonic seizure. The skin appears flushed, and serum lactic acid level is elevated. The nitroprusside infusion rate is found to be higher than recommended. Which of the following mechanisms is most likely responsible for the drug toxicity seen in this patient?

A. Disruption of tissue oxygen delivery

B. Impaired conversion of pyruvate to acetyl-CoA

C. Inhibition of electron transfer to oxygen

D. Uncoupling of oxidative phosphorylation

3. Identify the true statements:
1. At physiological pH, arginine has a positive charge
2. Selenocysteine is coded by UGA
3. Heme synthesis occurs in BM, RBCS and hepatocytes
4. Vitamin C cannot be produced in humans due to lack of L-gulonolactone oxidase

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A. 1,2,3,4
B. 3,4
C. 1,2,4
D. 2,3

4. A child before playing consumed fruit from the garden. After some time, he developed a high fever, confusion, photophobia, and unable to urinate. What are the likely causative agent and the appropriate antidote used in this case?

A. Datura, Pralidoxime
B. Datura, Physostigmine
C. Yellow oleander, Pralidoxime
D. Yellow oleander, Physostigmine

5. A child presents with erythematous lesions as shown below. What is the likely genetic defect?

A. SLC39A4
B. ATP7A
C. ATP7B
D. KCNJ2

6. Identify the method shown below:

A. Burking
B. Gagging
C. Choking
D. Traumatic asphyxia

7. Which of the following is not a copper containing enzyme?

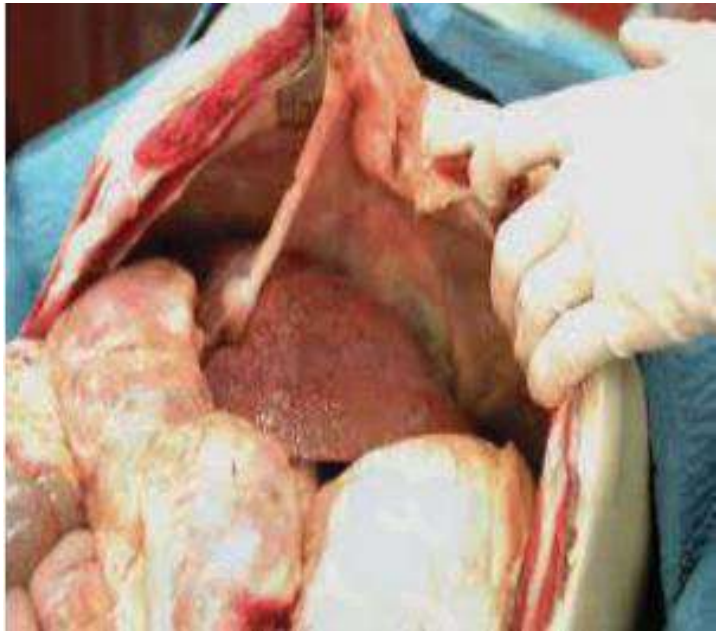
A. Xanthine oxidase
B. Superoxide dismutase
C. Tyrosinase
D. Lysyl oxidase

8. All of the following are true about Chronic starvation except?

A. Exhaustion
B. Hyperthermia
C. Heart Atrophy
D. Hypotension

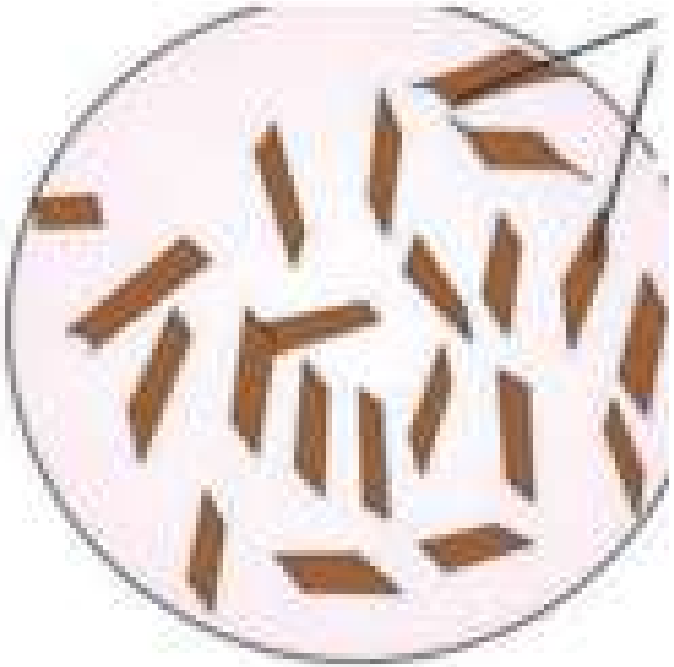
9. The method of autopsy shown in the image is?

A. Virchow technique
B. Rokitansky technique
C. Ghon technique
D. Letulle technique



10. Which of the following is seen in low insulin: glucagon ratio?

A. Activation of lipoprotein lipase
B. Activation of glycogen synthase
C. Activation of phosphofructokinase-1
D. Activation of hormone-sensitive lipase

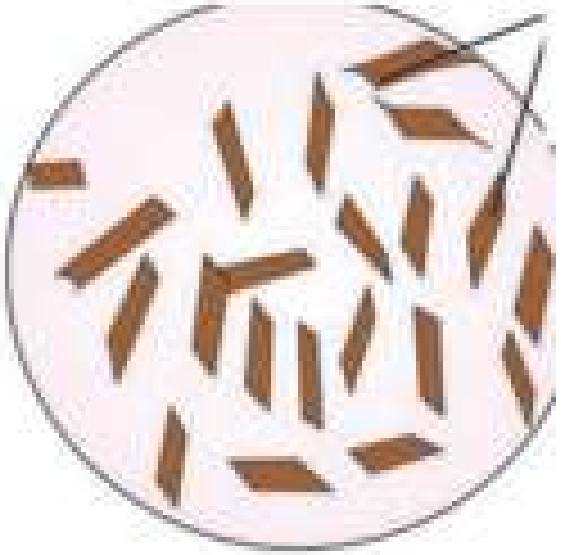


11. A 3-year-old, previously healthy boy is brought to the emergency department due to accidental drug ingestion. His mother found him playing with his grandfather's pill bottles earlier today, and later, he developed nausea and vomited twice. The patient also began breathing rapidly and appeared ill. His grandfather recently had a myocardial infarction and takes multiple medications. Laboratory studies reveal high anion gap metabolic acidosis. Treatment with intravenous sodium bicarbonate infusion is begun. This therapy is most likely to provide a beneficial effect via which of the following mechanisms?

A. Decreasing cardiotoxic effects of the drug
B. Decreasing charged form of the drug in plasma
C. Increasing drug trapping in the gastric lumen
D. Increasing excretion of the drug in the urine

12. A 10-year-old male child came to the casualty with difficulty in walking and pain in the perianal region. On subjecting the specimen from the perianal region to a test, the following dark brown rhombic crystals are seen under the microscope. What is the test done?

A. Barberio's test
B. Florence test
C. Teichmann test
D. Acid phosphatase test



13. Which of the following compounds is needed for all the following reactions?

1. Norepinephrine to Epinephrine
2. Ethanolamine to Choline
3. Acetyl serotonin to Melatonin
4. Guanidinoacetate to Creatine

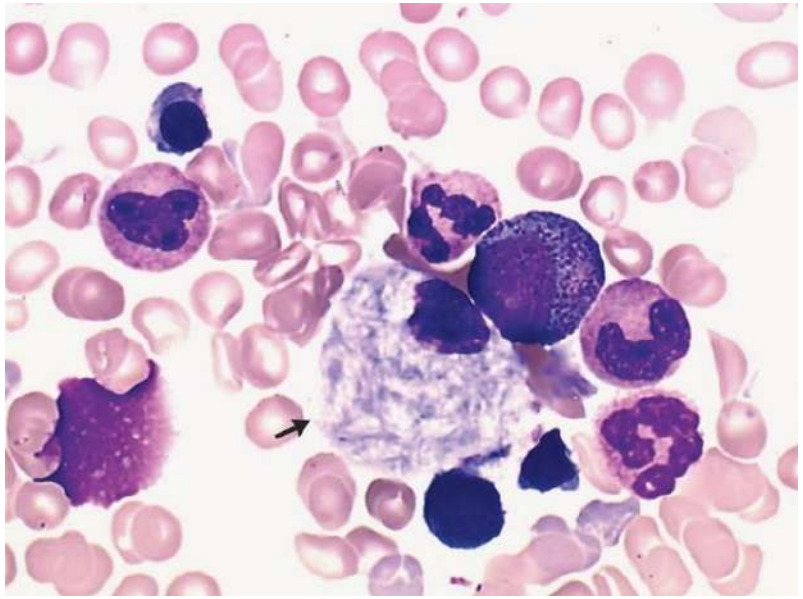
A. Methyl cobalamin
B. Acetyl CoA
C. S-Adenosyl Methionine
D. S-Adenosyl Serine

14. An accused died in lock up during the police interrogation. Enquiry in this case will be done by?

A. Judicial Magistrate
B. Executive magistrate
C. Police IG
D. Both a and b

15. A child presents with bone pain and hepatosplenomegaly. A trephine biopsy show the following finding. Which of the following is the most likely enzyme deficient in this condition?

A. Hexosaminidase A
B. Glucocerebrosidase
C. Sphingomyelinase
D. α-1,4-Glucosidase



16. A 35-year-old man with a history of bipolar and substance use disorders comes to the emergency department due to depression, auditory hallucinations, and suicidal ideation. His medications include lithium and escitalopram. The patient has a history of 5 psychiatric hospitalizations and 2 past suicide attempts, including overdose on his medications and attempted hanging. The patient has been using "anything I can get my hands on" because his depression is unbearable. He is hospitalized and placed on suicide precautions. His dose of escitalopram is increased to target his depression, and risperidone is added to treat the hallucinations. His lithium level is 1.0 mEq/L. On the second day of hospitalization, the patient reports muscle pains, abdominal cramping, nausea, and diarrhea. His temperature is 37.2 C (99 F), blood pressure is 130/85 mm Hg, and pulse is 84/min. The patient is alert and restless, and his pupils are dilated bilaterally. Bowel sounds are hyperactive and neurologic examination is normal. Which of the following is the most likely explanation for his symptoms?

A. Serotonin syndrome

B. Cocaine withdrawal

C. Lithium toxicity

D. Opioid withdrawal

17. A patient from Kota has fluorosis and typical brown staining of teeth as shown in the given image. Which bony change will occur in this patient?

A. Osteosclerosis
B. Osteopetrosis
C. Osteoporosis
D. Osteomalacia

18. What is the function of HSP-70?

A. Ubiquitinization of protein
B. Protein modification
C. Protein folding
D. Protein cleavage

19. IPC Section 314 deals with?

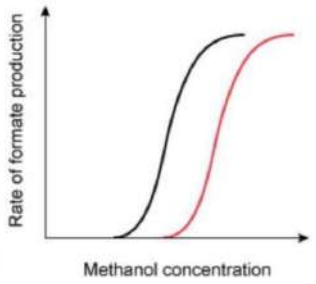
A. Abortion with consent of mother
B. Abortion without consent of mother
C. Abortion leading to death of mother
D. Preventing the child from being born alive

20. Which of the following is responsible for the negative charge in fibrinopeptide A?

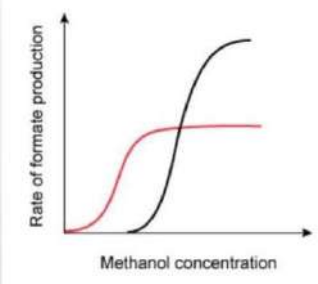
A. Glutamate and Valine
B. Histidine and Lysine
C. Aspartate and glutamate
D. Serine and Threonine

21. A 42-year-old man is brought to the emergency department due to nausea, vomiting, and blurred vision. He was making his own whiskey with a home moonshine still and started feeling sick after sampling the first several ounces of distillate. Funduscopic evaluation reveals optic disc hyperemia. Laboratory results show a high anion gap metabolic acidosis. He is started on fomepizole, a medication that transiently binds to alcohol dehydrogenase. Which of the following graphs most accurately portrays the change in enzyme kinetics after administration of the antidote?

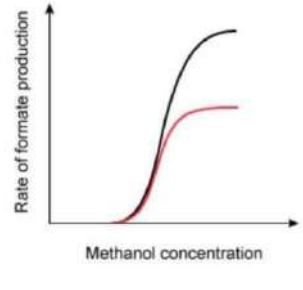
A



C



B



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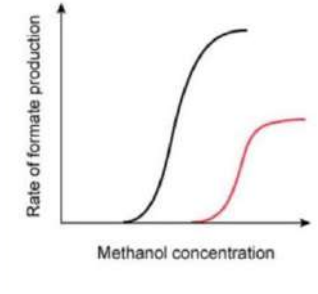


22. 15-year-old boy is brought to the emergency department due to worsening rash and profuse sweating for the past week. He has also felt generally unwell, with difficulty sleeping and sensitivity to light. Skin examination is significant for an erythematous maculopapular rash over the torso, thighs, and upper arms, as well as pink macules over the palms and soles with associated desquamation. Neurologic examination shows a slight tremor. Excessive exposure to which of the following is most likely responsible for this patient's presentation?

A. Phosphorus
B. Lead
C. Marijuana
D. Mercury

23. Identify the correct statements:
1. Serotonin is also known as 5-hydroxytyramine
2. Anaerobic glycolysis of glycogen produces 3 ATPs per unit glucose consumed
3. Flipped LDH ratio implies LDH1 > LDH 2
4. Hexokinase I is released from the hypothalamus

A. 1,2,3,4
B. 2,3,4
C. 2,3
D. 1,4

24. The temperature of a body of a deceased person is found to be 39 degrees Celsius. All of the following maybe causes except?

A. Stychnine poioning
B. Datura
C. Duret hemorrhages
D. Intraabdominal hemorrhage

25. 34-year-old previously healthy man comes to the emergency department due to a 3-hour history of chest pain, diaphoresis, and dyspnea. He does not smoke, exercises regularly, and eats a balanced diet. His father died at age 56 from a myocardial infarction. ECG shows ST elevation in the anterolateral leads. Coronary angiogram reveals proximal left anterior descending artery stenosis and thrombosis, which is treated with angioplasty and stent placement. Laboratory results are as follows:
Total cholesterol: 160 mg/dL
Glucose, serum: 98 mg/dL
Homocysteine, plasma: 21.5 umol/L (normal: 4-14 pmol/L)
Further testing reveals a homozygous mutation in the methylene tetrahydrofolate reductase gene that leads to decreased enzymatic activity. Due to this defect, the patient most likely has impairment converting homocysteine to which of the following?

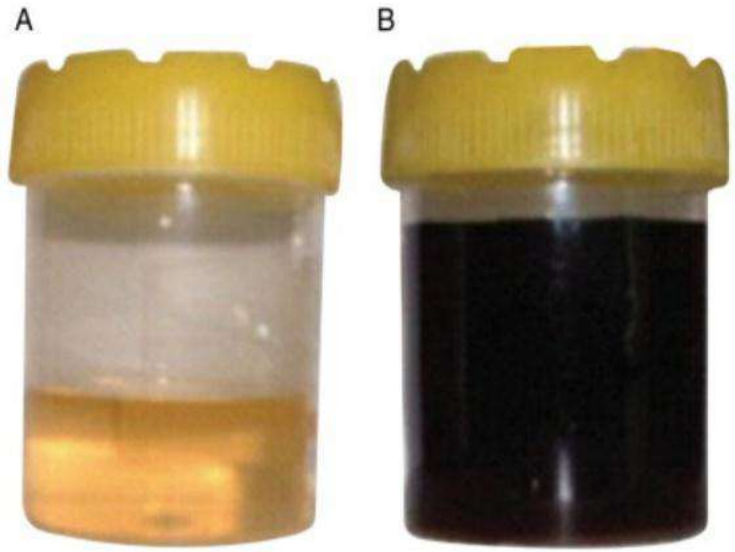
A. Cystathionine
B. Cysteine
C. Methionine
D. Methylmalonyl-CoA

26. Identify the type of injury shown in the picture below:

A. Incised looking laceration
B. Incised wound
C. Lacerated wound
D. Stab wound

27. The lab technician notices a urine sample from a 4-year-old male that was normal on collection but turns into the color shown in the image after a few hours. Deficiency of which of the following can cause this condition?

A. Beta-carotene
B. Tyrosine aminotransferase
C. L-ascorbic acid
D. Homogentisic acid oxidase



28. A 5 young boy presented with the following manifestation. Which assay is most appropriate?

A. RBC glutathione reductase
B. RBC NAD
C. RBC transketolase
D. Xanthenuric assay

29. A farmer was sleeping in the field, and he felt a sting on his leg. He saw something moving away quickly. He then got drowsy and was taken to the hospital. He developed pain around the site and continued to bleed profusely from the wound site. The wound became red with blisters. Which of the following is the most likely cause?

A. 

B. 

C. 

D. 

30. Which of the following should be avoided by a patient of trimethylaminuria?

A. Biotin
B. Choline
C. Niacin
D. Pantothenic acid

31. Identify the incorrect statements
1. Spider and scorpion bites may produce a catecholamine storm
2. Edmond Locard is known for study of fingerprints
3. Posthumous child can be best defined as delivery of a macerated fetus
4. Basiocciput fuses with basisphenoid at 18-22 years

A. 1,2,3,4
B. 2,3
C. 1,4
D. 1,2,3

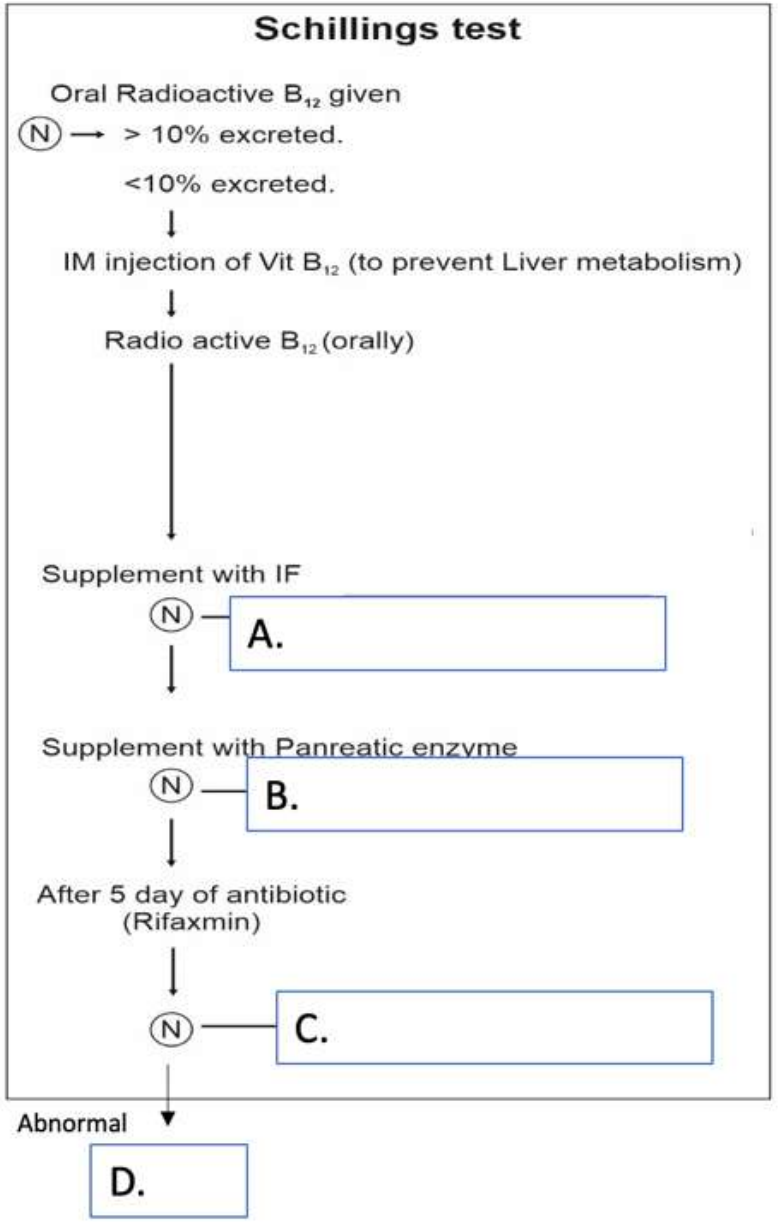
32. Identify A, B, C, D

A. A-Pancreatitis, B-Pernicious anemia, C-BOGS, D-Liver failure

B. A-Renal failure, B-Pernicious anemia, C-Malabsorption, D-BOGS

C. A- Pernicious anemia, B- Pancreatitis, C-Liver failure, D-Malabsorption

D. A- Pernicious anemia, B- Pancreatitis, C-BOGS, D-Malabsorption



33. Which organ is the earliest to undergo putrefaction from the given options?

A. Brain
B. Heart
C. Kidney
D. Prostate

34. Identify the test which follows the principle ‘Prior knowledge of the events/activity will influence the suspect's reaction’?

A. Truth Serum
B. Polygraph
C. Hypnosis
D. Brain mapping

35. Match the following:

A. Tyrosinemia Type I	1. tyrosine transaminase
B. Tyrosinemia Type II	2. para-hydroxyphenylpyruvate hydroxylase
C. Tyrosinemia Type III	3. fumaryl acetoacetate hydrolase
D. Galactosemia	4. Galactose-1-phosphate uridyl transferase
	5. Galactokinase

A. A-1, B-2, C-3, D-4

B. A-1, B-2, C-3, D-5

C. A-3, B-2, C-1, D-4

D. A-3, B-1, C-2, D-4

36. Identify the human fingerprint shown below?

A. Whorl
B. Arch
C. Loop
D. Composite

37. A 40-year-old farmer is brought to the emergency department due to an alleged suicide attempt. On physical examination, the patient is diaphoretic. The pupils are pinpoint and unreactive, and significant tearing is noted. Diffuse rhonchi and wheezing are present in the lungs bilaterally. Muscle strength is diminished throughout, and fasciculations are noted in the extremities. First-line therapy is administered, but the patient remains weak. Treatment with which of the following is most likely to improve this patient's current condition?

A. Diphenhydramine
B. Hemodialysis
C. Physostigmine
D. Atropine

38. Which of the following enzymes simultaneously incorporates molecular oxygen and produces water?

A. Catalase
B. Cytochrome C oxidase
C. Acetyl CoA carboxylase
D. Choline esterase

39. Which of the following poisons cause bluish discoloration of the stomach mucosa on postmortem examination?

A. Oxalic acid
B. Sodium amytal
C. Phenol
D. Sulphuric acid

40. An autopsy is performed on a 9-month-old boy who died due to refractory seizures. Examination shows microcephaly and skin with diffuse hypopigmentation. Further work-up reveals deficiency of a cofactor required for the formation of neurotransmitters found predominantly in the substantia nigra and locus caeruleus. The absence of this cofactor is most likely to directly affect the function of which of the following enzymes?

A. Branched-chain alpha-ketoacid dehydrogenase
B. Dopamine hydroxylase
C. Homogentisic acid oxidase
D. Phenylalanine hydroxylase

41. A dead body is brought for evaluation. On post-mortem examination, a ligature that was completely encircling the neck, horizontal, and below the level of the thyroid was seen. There was no dribbling of saliva. What is the cause of death?

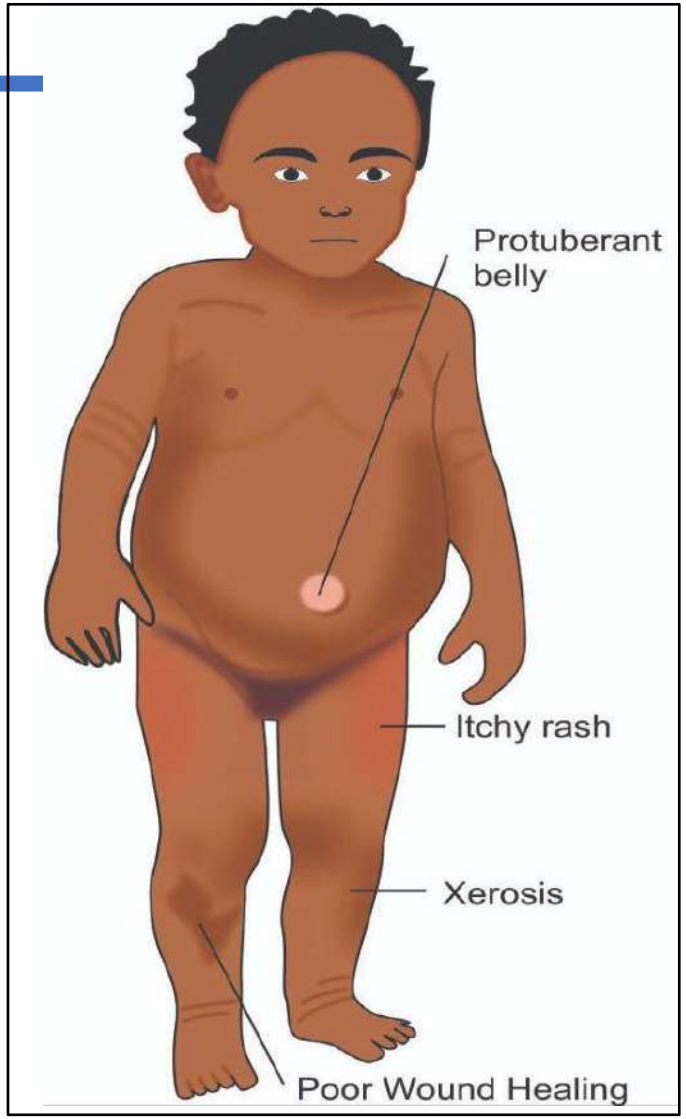
A. Throttling
B. Ligature strangulation
C. Gagging
D. Hanging

42. Lipotrophic factors are all except?

A. Choline
B. Lecithine
C. Arginine
D. Methionine

43. Following appearance is seen in:

A. Diabetes
B. Kwashiorkor
C. Marasmus
D. Hypothyroidism



44. A 35-year-old man comes to the office with progressively worsening fatigue associated with dark urine and back pain. Two days ago, the patient ate some large, flat beans brought home by his wife after a business trip to Egypt. Physical examination shows jaundice and pallor. Laboratory results reveal a hemoglobin level of 8 g/dL. Further evaluation reveals deficiency of an enzyme involved in the conversion of glucose-6-phosphate to ribulose-5-phosphate. The substance generated during this conversion is necessary for which of the following biochemical processes?

A. ADP phosphorylation
B. Fatty acid synthesis
C. Glycogen storage
D. Ketone body synthesis

45. A dermatology researcher is studying the role of different amino acids in wound healing. She cultures mature dermal fibroblasts in growth media. After several days, the fibroblasts begin synthesizing polypeptide chains that assemble into triple helical structures, followed by fibrils. The fibrillar proteins are hydrolyzed and separated into their constituent amino acids via paper chromatography . Which of the following amino acids is most likely to be found in highest quantity in these proteins?

A. Alanine
B. Cysteine
C. Glycine
D. Proline

46. Glycogen synthesis and breakdown takes place in the same cell, having enzymes necessary for both the pathways. Why the glucose-6-phosphate, freshly synthesized during glycogenesis in cytoplasm of hepatocytes, is not immediately degraded by the enzyme glucose-6-phosphatase?

A. The thermodynamics does not favor such a reaction to occur
B. Glucose-6-phosphatase is present in the endoplasmic reticulum and cannot act on glycogen formed in the cytoplasm
C. Glycogenesis and glycogenolysis are tightly regulated such that enzymes of only one of those are present at a time.
D. Steric hindrance due to albumin

47. 2-month-old boy is is brought to the emergency department due to irritability and vomiting. The patient is exclusively breastfed but has not been tolerating feeds since yesterday. Urine output has decreased. The mother has a history of obesity and had gastric bypass surgery several years prior to pregnancy. Chest radiography reveals cardiomegaly. Further work-up shows impaired carbohydrate metabolism with increased serum levels of lactate and decreased erythrocyte transketolase activity. Which of the following additional enzymes is most likely to have impaired activity in this patient?

A. Alpha-1,4-glucosidase
B. Alpha-L-iduronidase
C. Galactose-1-phosphate uridyltransferase
D. Pyruvate dehydrogenase

48. A 45 year old chronic alcoholic man presented with confusion, ataxia and diplopia. What is the treatment protocol?

A. Vitamin B1 injection followed by glucose infusion
B. Glucose infusion followed by Vitamin B1 injection
C. Glucose infusion alone
D. Thiamine infusion alone

49. A 24-year-old woman comes to the emergency department due to bloody emesis. She had 2 episodes of vomiting bright red blood and feels lightheaded and dizzy. The patient was recently diagnosed with factitious disorder after being hospitalized multiple times for a myriad of symptoms and undergoing several invasive procedures. Physical examination shows scattered ecchymoses. The abdomen is soft and nontender. Rectal examination shows maroon-colored, guaiac-positive stool. After much questioning, she admits to having ingested rat poison several days ago. Immediate treatment of this patient should include which of the following?

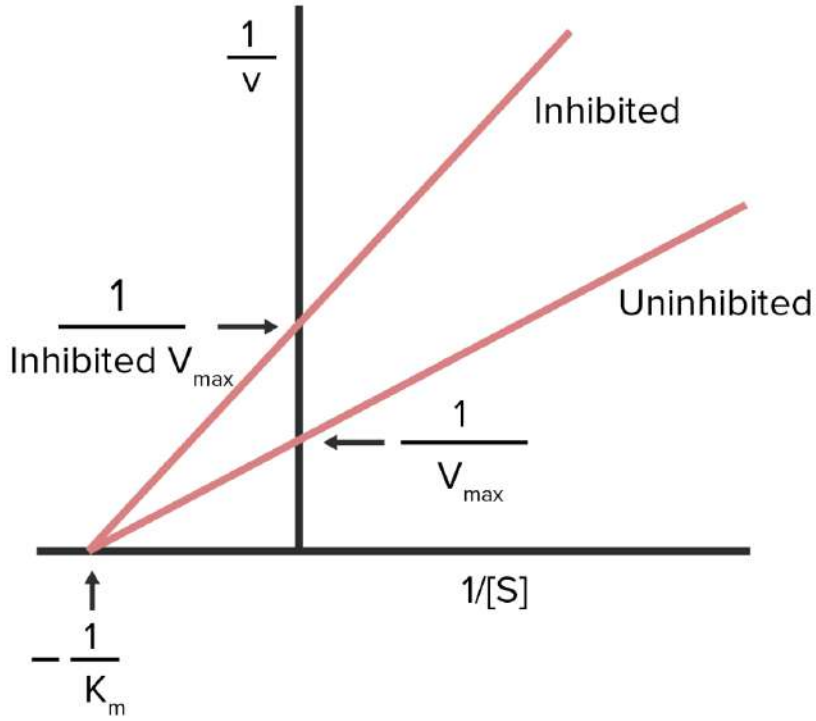
A. Cryoprecipitate
B. Fresh frozen plasma
C. Platelet transfusion
D. Protamine sulfate

50. Which of the following diseases have autosomal recessive inheritance?

A. Albinism
B. G-6-PD deficiency
C. Marfan's syndrome
D. Lesch-Nyhan syndrome

51. The following graph is most likely to be seen in:

A. Non-competitive inhibition
B. Competitive inhibition
C. Un-competitive inhibition
D. Allosteric inhibition



Lineweaver-Burke

52. Identify the correct statements:
1. In a patient with Wilson's disease, 3-methylhistidine is decreased in urine.
2. Direct positive Van der bergh's reaction is seen in a case of obstructive jaundice.
3. If the percentage of thymine residues in DNA is 28%, percentage of cytosine is 22%
4. Thermogenin is present in the mitochondria.

A. 1, 2, 3, 4
B. 1, 2, 3
C. 2, 3, 4
D. 1, 4

53. Which of the following helps in the transport of fatty acids across the inner mitochondrial membrane?

A. Acyl carrier protein
B. Carnitine
C. Lecithin-cholesterol acyltransferase
D. Carnitine and albumin

54. Match the following:

A. Obtaining sexual pleasure by wearing clothes of opposite sex	Frotteurism
B. Desire to seek surgery to become member of opposite sex	Eonism
C. Sexual gratification by rubbing his private parts against another person	Exhibitionism
D. Exposure of one's genitals to an unsuspecting stranger	Transsexualism

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A. A-2, B-4, C-1, D-3
B. A-4, B-2, C-1, D-3
C. A-1, B-2, C-3, D-4
D. A-2, B-4, C-3, D-1

55. Which of the following amino acid is necessary for conversion of nor-epinephrine to epinephrine?

A. Tyrosine
B. Tryptophan
C. Phenyl alanine
D. Methionine

56. In which of the below circumstances does Dying declaration become invalid?

A. Dying declaration recorded by medical officer
B. The victim survive after recording dying declaration.
C. Dying declaration not sign by attendent
D. Dying declaration by police officer

57. Identiplant shown below?

A. Cocaine
B. Hyoscine
C. Tobacco
D. Tetrahydro-cannabinol

58. Which of the following steps in the metabolism of Vitamin D requires sunlight?

A. 1, 25 dihydroxycholecalciferol to 7-dehydrocholesterol
B. 7-dehydrocholesterol to cholecalciferol
C. Cholecalciferol to 25-hydroxycholecalciferol
D. 25-hydroxycholecalciferol to 1, 25 dihydroxycholecalciferols

59. Identify the wound:

A. Entry Close range
B. Entry Contact range
C. Entry Intermediate range
D. Exit wound.

60. A 6-month-old girl is brought to the OPD by her mother for a check-up appointment. The mother states, "My baby doesn't seem to be growing much despite feeding as often as my previous children I'm worried that something is wrong with her." Height and weight are below the 10th percentile. Physical examination shows hepatomegaly and hypotonia. Laboratory results show hypoglycemia and ketoacidosis. Liver biopsy shows hepatic fibrosis without fat accumulation. Further analysis reveals excessive amounts of limit dextrins within the cytosol of the hepatocytes. Which of the following enzymes is most likely deficient in this patient?

A. Acid alpha-glucosidase
B. Glucose-6-phosphatase
C. Glycogen debrancher enzyme
D. Liver glycogen phosphorylase

61. A 17-year-old girl with a history of depression is brought to the emergency department after attempting suicide. Her parents report that she consumed 2 bottles of insecticide after having an argument with her sister approximately 2 hours prior to the presentation. The patient's symptoms include nausea, vomiting, abdominal pain, and copious watery diarrhea. Her breath has a faint garlic odor, and she has numerous healing linear scars on her forearms. Which of the following medications should be administered immediately?

A. CaNa, EDTA

B. Deferoxamine

C. Dimercaprol

D. Hydroxycobalamin

62. Nutrition researchers investigating the relationship between fructose consumption and cardiovascular disease conduct a prospective cohortstudy on a population of randomly selected young adults. Study participants undergo semi-annual measurement of waist circumference, blood pressure, and serum cholesterol and triglyceride concentrations. Dietary fructose consumption is assessed through the use of questionnaires and by measuring urinary fructose excretion. A 23-year-old man enrolled in the study is found to excrete large amounts of fructose in his urine compared to other study participants despite maintaining a moderate fructose intake. Further evaluation shows a hereditary defect in fructose metabolism, but he is asymptomatic and has no other medical problems. This patient most likely remains able to metabolize fructose due to the compensatory activity of which of the following enzymes?

A. Aldolase B
B. Aldose reductase
C. Fructokinase
D. Hexokinase

63. Which of the following pathways whose rate limiting enzymes are given occurs only in cytoplasm:

A. Carnitine acyltransferase I
B. HMG-CoA synthase
C. Glycogen phosphorylase
D. Fructose-1, 6-bisphosphatase 1

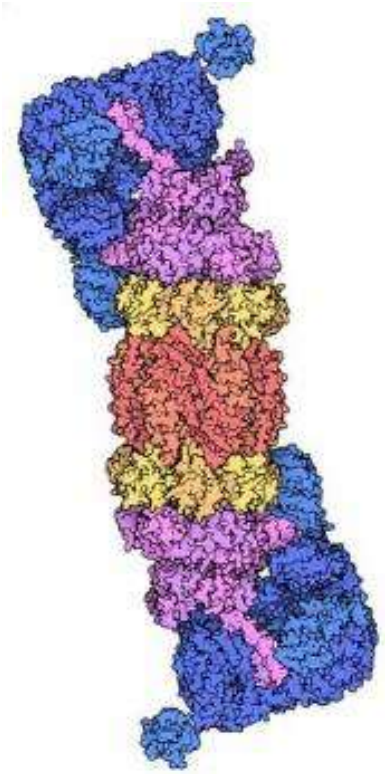
64. Match the following:

Preservation for histopathology samples	NACL
Most common Preservation for Viscera for Toxicological analysis	Rectified spirit
Urine	NaF
Blood	Formalin
	Toluene blue

A. A-2, B-1, C-5, D-3
B. A-1, B-2, C-4, D-3
C. A-3, B-5, C-1, D-2
D. A-4, B-1, C-5, D-3

65. What is the function of the structure shown in the image below?

A. Protein folding
B. Post-translational modification
C. Protein degradation
D. Protein sorting

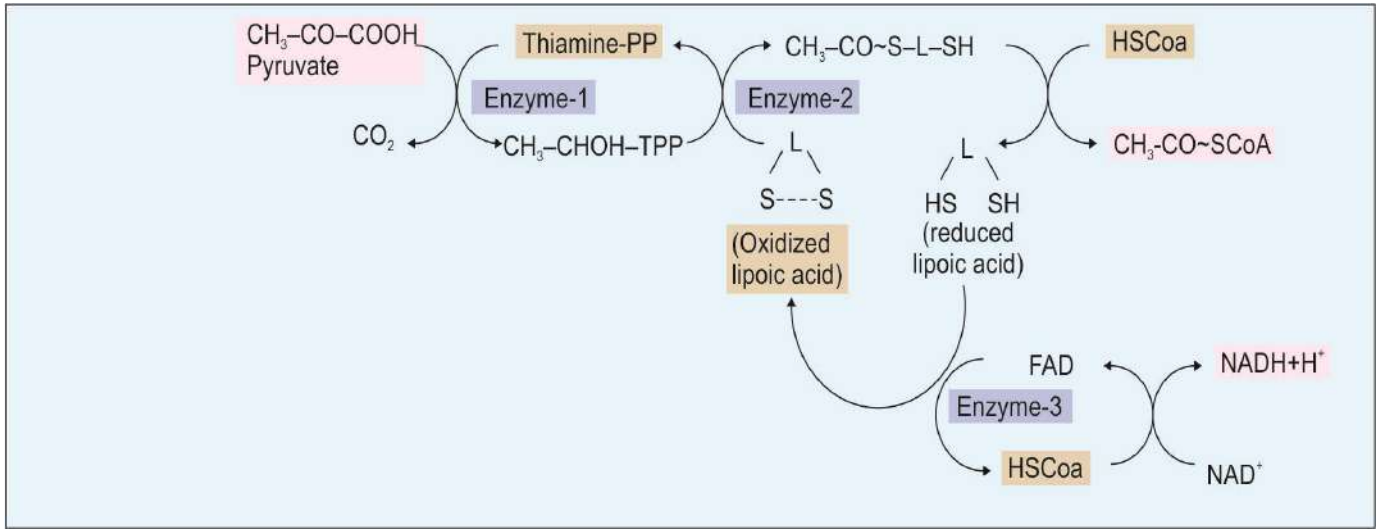


66. A 57-year-old man is brought to the emergency department due to lethargy and altered mental status. His family suspects a suicide attempt. Medical history is significant for dilated cardiomyopathy and major depressive disorder. On arrival, blood pressure is 76/46 mm Hg, pulse is 38/min, and respirations are 16/min. Pupils are 3mm and reactive. Oropharynx is normal. Examination shows bilateral wheezing. There is no peripheral edema. Capillary refill is 3 seconds. There is no diaphoresis. Which of the following categories of medication did this patient most likely ingest?

A. Beta blocker
B. Cardiac glycoside
C. Opioid
D. Organophosphate

67. The enzymes that convert pyruvate to acetyl CoA are given in the diagram. What are the enzymes marked as E1 and E2 respectively?

A. Pyruvate dehydrogenase and dihydrolipoyl transacetylase
B. Pyruvate carboxylase and dihydrolipoyl transacetylase
C. Pyruvate dehydrogenase and dihydrolipoyl dehydrogenase
D. Pyruvate carboxylase and dihydrolipoyl dehydrogenase



68. A 2-year-old boy is brought to the emergency department due to sudden-onset facial redness. The symptoms were first noticed by the parents about 1 hour ago. The mother also noticed an opened bottle of a vitamin supplement with a few capsules spilled on the floor. This patient most likely ingested a vitamin that has which of the following biochemical functions?

A. Coenzyme in hydroxylation of prolyl and lysyl residues
B. Component of coenzyme A
C. Precursor for flavin adenine dinucleotide production
D. Precursor for nicotinamide adenine dinucleotide production

69. An 18-month-old boy is brought to the OPD due to language regression. He said several words at his 1-year appointment but now no longer speaks any words at all. His moods have also become more unpredictable over the past 4 months with frequent tantrums. The parents tried to bring him in sooner for evaluation, but they live in an impoverished part of the city and experienced financial difficulties with transportation to the office. On physical examination, the boy is quiet and maintains appropriate eye contact throughout the visit. Hemoglobin is 9 g/dL. Which of the following enzymes is most likely inhibited in this patient?

A. 5-Aminolevulinate dehydratase
B. Bilirubin glucuronyl transferase
C. Porphobilinogen deaminase
D. Uroporphyrinogen decarboxylase

70. All of the following amino acids absorb UV light at 250-290m except:

A. Tryptophan
B. Tyrosine
C. Phenylalanine
D. Methionine

71. In the contributory negligence case who bears the onus of proof?

A. Patient
B. Police not under rank of sub inspector
C. Magistrate
D. Doctor

72. Following are the reasons for thiamine deficiency Except:

A. Veganism
B. Chronic alcoholic
C. Chronic use of diuretics
D. Bariatric surgery

73. A child who is a victim under POCSO act is brought to the department of forensic medicine for age estimation. The X-ray image of the hand is shown below. What is the likely age of the child?

A. 18 years
B. 7 years
C. 9 years
D. 13 years

74. A research scientist is studying biochemical reactions that take place in the liver. He cultures hepatocytes in a growth media enriched with glutamate labeled with nitrogen isotopes. After some time, he finds that the nitrogen isotopes are transferred to oxaloacetate, forming aspartate in the process. Which of the following substances is most likely involved in this reaction?

A. Biotin
B. Folic acid
C. Niacin
D. Pyridoxine

75. A 31-year-old man comes to the OPD for a routine checkup. The patient works as a fitness trainer and lifts weights recreationally. He has been consuming carbohydrate-rich food prior to his weightlifting sessions and claims that it increases muscle strength. A literature review shows that the rate of glycogenolysis within myocytes increases several hundredfold during active skeletal muscle contraction. Which of the following substances is most likely responsible for increasing the reaction rate during active contraction?

A. ATP
B. Ca
C. cAMP
D. Glucose-6-phosphate

76. A mutation in a non-coding DNA sequence is believed to affect expression of the gene coding for a specific fetal enzyme. Liver and bone marrow cells from the fetus and his parents are obtained. Which of the following is the best method to determine if this gene is being transcribed in cultures of the isolated cells?

A. Northern blot
B. Western blot
C. Southern blot
D. Southwestern blot

77. A research scientist studying the metabolic pathways that contribute to obesity feeds experimental animals a high-carbohydrate, high-protein diet for a prolonged period. A sample of liver tissue is then obtained from the animals, and the activity of various enzymes involved in fatty acid metabolism is measured and recorded. It is determined that beta-oxidation of fatty acids is inhibited within these cells as a result of the diet. An increase in which of the following substances is most likely responsible for the observed effect?

A. Acetoacetate
B. Carnitine
C. Citrate
D. Malonyl-CoA

78. Match the following:

A. Nucleotide excision repair	1. Xeroderma pigmentosa
B. NHEJ repair	2. HNPCC
C. Base excision repair	3. SCID
D. Mismatch repair	4. MUTYH polyposis

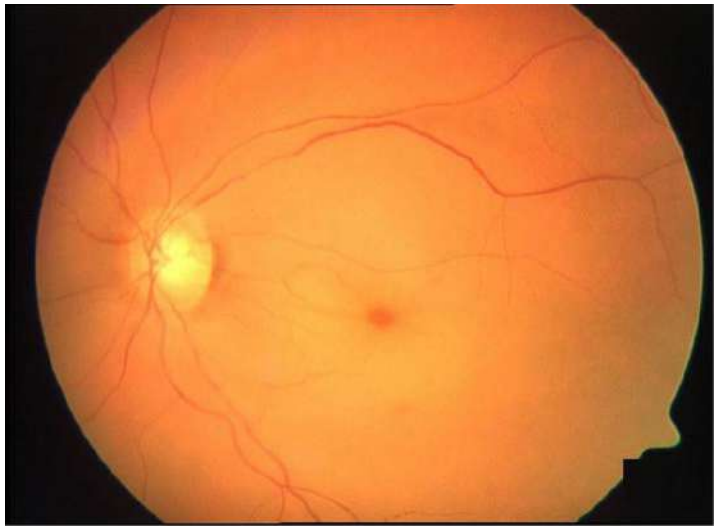
A. A-1, B-3, C-4, D-2
B. A-3, B-1, C-4, D-2
C. A-1, B-3, C-2, D-4
D. A-1, B-2, C-3, D-4

79. Which among the following has low glycemic index?

A. Sweet corn
B. Watermelon
C. Papaya
D. Potato

80. A 8-month-old girl is brought to the OPD for evaluation of iritability and regression of motor skills. Her parents have also noticed that she startles easily with loud noises. Head circumference measurement is consistent with macrocephaly. Bilateral funduscopic evaluation is shown. Which of the following metabolites is most likely present in this patient's tissues?

A. Galactocerebroside
B. Glucocerebroside
C. Sphingomyelin
D. GM2 ganglioside



81. An 8-year-old boy is brought to the emergency department due to vomiting and lethargy. The patient had been on an overnight hiking trip with his family. During the trip, the family lost their food pack while canoeing and had to hike back to their car. The child became weak and was carried for the last mile. None of the family has eaten for approximately 24 hours. On examination, the patient appears listless. Mild hepatomegaly is noted.
Laboratory results are as follows:
Glucose: 22 mg/dL
Acetoacetate: not detected
The patient begins seizing shortly after arriving at the emergency department. Which of the following enzymes is most likely deficient in this patient?

A. Acetyl-CoA carboxylase
B. Acid alpha-glucosidase
C. Acyl-CoA dehydrogenase
D. Glucose 6-phosphatase

82. Which of the following minerals are required in amounts <100mg per day?

A. Copper
B. Calcium
C. Chromium
D. Iodine

83. You are conducting an experiment on mitochondrial respiration. You add malate/ pyruvate and respiration is normal. You add succinate and respiration is normal. When you add another substance in the presence of pyruvate/succinate and malate, respiration is blocked. Which of the following substances is most likely added?

A. Rotenone
B. Antimycin A
C. Oligomycin
D. 2,4-dinitrophenol

84. A 2-year-old boy is brought to the emergency department with fever, vomiting and sleepiness. He had several episodes of emesis this morning and his mother was unable to wake him from his afternoon nap. Since the newborn period, the parents say that the patient has had multiple illnesses characterized by vomiting and sleepiness. Prior laboratory testing revealed increased blood ammonia levels during these episodes and markedly increased orotic acid excretion in the urine. Physical examination shows a tachypneic boy who is unresponsive to all stimuli. Which of the following enzymes is most likely to be deficient in this patient?

A. Carbamoyl phosphate synthetase I
B. N-acetylglutamate synthetase
C. Ornithine transcarbamylase
D. Uridine monophosphate synthetase

85. A patient presented with symptoms of peripheral neuropathy and macrocytic anemia. She was given folate 5mg and the blood picture improved. However, the neurologic manifestations were aggravated. What is the most likely cause?

A. Malabsorption of folate
B. Treatment with folate unmasking pyridoxine deficiency
C. Deficiency of folate reductase in CNS
D. Folate therapy using the B12 stores

86. A 36-year-old man comes to the OPD due to skin lesions on his palms. The patient has yellowish skin nodules over the palmar creases that have been increasing in size and number over the past several years. He also has small clusters of yellow papules on his elbows, knees, and buttocks. His father died of a myocardial infarction at age 56. Biopsy of his lesions shows accumulation of lipid-laden macrophages. Immunoblot analysis suggests a lack of ApoE3 and ApoE4 in his circulating lipoproteins. Which of the following is most likely Impaired in this patient?

A. ApoC-2 production
B. Cholesterol esterification in the blood
C. Chylomicron remnant uptake by liver cells
D. LDL particle uptake by hepatocytes

87. Identify the type of injury from the picture given below:

A. Laceration
B. Incised wound
C. Laceration looking incised wound
D. Incised looking laceration

88. A 31-year-old previously healthy man comes to the OPD due to myalgias, anorexia, and skin rash. The patient works as a personal trainer and is a bodybuilding enthusiast. He denies using anabolic steroids but has been consuming large amounts of raw egg whites for the past several months. Physical examination shows macular dermatitis of the extremities. A water-soluble vitamin deficiency is suspected as the cause of his condition. Which of the following biochemical conversions most likely uses the deficient vitamin as a cofactor?

A. Glucose to ribose-5-phosphate
B. Pyruvate to acetyl-CoA
C. Pyruvate to alanine
D. Pyruvate to oxaloacetate

89. A researcher placed two functional mRNA sequences that contain trinucleotide repeats of CUC and CUU into a solution containing functional ribosomes and tRNAs that have the appropriate amino acids. After a few hours, it was observed that both mRNA sequences resulted in the production of polypeptide chains with repeated leucine amino acids. Which genetic principle can explain the observed outcome in this experiment?

A. Ambiguity
B. Degenerate
C. Universality
D. Overlapping

90. Identify the correct statement with regards to the changes around an entry wound:
1. Grease collar - due to the deposition of the lubricant of the bullet in the tissues
2. Burn injuries - occur due to flame released during the firing
3. Blackening – due to deposit of smoke
4. Tattooing - Due to unburned grains of gunpowder

A. 1, 2, 3, 4
B. 1, 3, 4
C. 2, 3
D. 2, 4

91. Which of the following statements is incorrect about isoenzymes?

A. Isoenzymes catalyse the same reaction and are physically distinct forms of enzyme
B. Isoenzymes have different kinetics (km and Vmax)
C. Isoenzymes have Different 1° and 4° structures
D. All of the above statements are correct

92. Although Apo B 48 and Apo B 100 are derived from the same gene but are finally translated into separate proteins. This is mainly due to?

A. DNA gene mutation in intestines
B. RNA interference
C. Alternate splicing
D. RNA editing

93. A 12-year-old boy is brought to the OPD due to gait instability and pruritic skin rash for the past several weeks. His mother reports that he has also been irritable and had loose stools during this time. The patient's childhood development has been unremarkable except for several episodes of similar skin rash that resolved spontaneously. Examination is shown below. Laboratory evaluation shows increased levels of neutral amino acids in the urine. This patient's symptoms would most likely respond to which of the following supplements?

A. Ascorbate
B. Niacin
C. Pyridoxine
D. Riboflavin

94. What is the active principle of the poison shown in the image?

A. Ricin
B. Bhilawanol
C. Abrin
D. Calotropin

95. Which vitamin, when infused in supraphysiological doses, causes macular edema and macular cysts?

A. Vitamin A
B. Vitamin D
C. Vitamin E
D. Vitamin B3

96. A 46-year-old man comes to the emergency department due to recurrent nosebleeds When interviewed for additional history, he becomes belligerent and uncooperative. The patient has a history of alcohol abuse and chronic mental illness. He has been placed in homeless shelters on multiple occasions but has not remained there for any prolonged periods. Physical examination shows swollen gums, scattered ecchymoses, and hyperkeratosis. He also has a chronic ulcer on the left lower extremity that does not appear to be infected. Which of the following mechanisms accounts for this patient's examination findings?

A. Abnormal oxidative decarboxylation of ketoacids

B. Abnormal proline hydroxylation

C. Abnormal transamination

D. Deficient methionine synthesis

97. A 35-year-old female who completed her family attended the gynaecology OPD with complaints of dysmenorrhoea, dyspareunia, painful defecation and urination. Sometimes she complained of pelvic pain before the start of menstruation. The doctor made a diagnosis of endometriosis and planned for a vaginal hysterectomy. During the surgery, the surgeon injured the ureter even after discharging his duty with care during the operation. The patient now filed a medical negligence case in court. According to which of the following doctrines is the doctor not negligent in the above-said case?

A. Doctrine of res ipsa loquitur
B. Doctrine of common knowledge
C. Calculated risk doctrine
D. Doctrine of contributory negligence

98. Identify the true statement about the image given below?

A. Seen within 24 hours of death
B. Due to sulph-meth-hemoglobin accumulation and formation
C. Due to aseptic nonbacterial cause
D. It is associated with a case of electrical burns

99. Which of the following is true about Rigor Mortis?

A. It involves only a group of voluntary muscles
B. It is dependent on nervous innervation
C. It does not occur in a fetus <7 months old
D. Muscle protein coagulation is the underlying mechanism

100. Which of the following is true about the structural organization of proteins?

A. Tertiary structure is three dimensional
B. Primary, secondary and tertiary structures are destroyed by denaturation
C. Secondary structure is stabilized by disulphide bonds
D. Secondary and Tertiary structure depends upon amino acid sequence

Thank You!

Biochemistry-FMT BTR test 2.0

Dr. Zainab Vora

1. A family consumes only polished rice. Which of the following combination of vitamin deficiency and enzymatic defect will be present in this family?

A. Riboflavin - Glutathione Reductase
B. Thiamine - Transketolase
C. Thiamine - Transaminase
D. Riboflavin - Transketolase

2. A 49-year-old man comes to the emergency department with severe shortness of breath. The patient has a history of hypertension and medication nonadherence. Blood pressure is 260/144 mm Hg and pulse is 100/min. Chest examination demonstrates bibasilar crackles. Intravenous furosemide and continuous nitroprusside infusion are started, along with noninvasive positive pressure ventilation, and he experiences improvement in his symptoms. The next morning, the patient is confused and lethargic, and he suffers a generalized tonic-clonic seizure. The skin appears flushed, and serum lactic acid level is elevated. The nitroprusside infusion rate is found to be higher than recommended. Which of the following mechanisms is most likely responsible for the drug toxicity seen in this patient?

A. Disruption of tissue oxygen delivery ✗
B. Impaired conversion of pyruvate to acetyl-CoA ✗ – PDH
C. Inhibition of electron transfer to oxygen
D. Uncoupling of oxidative phosphorylation ✓

nitroprusside → NO +
cyanide
|
Complex IV

3. Identify the true statements:

1. At physiological pH, arginine has a positive charge
2. Selenocysteine is coded by UGA
3. Heme synthesis occurs in BM, RBCS and hepatocytes
4. Vitamin C cannot be produced in humans due to lack of L-gulonolactone oxidase

A. 1,2,3,4

B. 3,4

C. 1,2,4

D. 2,3

4. A child before playing consumed fruit from the garden. After some time, he developed a high fever, confusion, photophobia, and unable to urinate. What are the likely causative agent and the appropriate antidote used in this case?

anticholin

A. Datura, Pralidoxime
B. Datura, Physostigmine
C. Yellow oleander, Pralidoxime
D. Yellow oleander, Physostigmine

5. A child presents with erythematous lesions as shown below. What is the likely genetic defect?

diarrhea

A. SLC39A4 → Zn

B. ATP7A → Menke's

C. ATP7B → Wilson

D. KCNJ2 → Hypo K^+ paralysis

6. Identify the method shown below:

A. Burking
B. Gagging
C. Choking
D. Traumatic asphyxia

7. Which of the following is not a copper containing enzyme?

A. Xanthine oxidase

B. Superoxide dismutase

C. Tyrosinase

D. Lysyl oxidase

Enzyme Cofactors

Metal	Metalloenzymes
Ca	Lipase, Lecithinase
Fe	Succinate deH
Zn	Carbonic anhydrase, Glutamate dehydrogenase, LDH, ALA dehydratase
Mg	Hexokinase, Phosphofructokinase, Glucose-6 phosphatase, Enolase, Glutathione synthase
Cu	Tyrosinase, Cytoplasmic SOD, Ceruloplasmin, Lysyl oxidase
Mn	Arginase, Ribonucleotide reductase, Mitochondrial SOD
Se	Glutathione peroxidase, Deiodinase
Mo	Xanthine Oxidase, Sulfite Oxidase

8. All of the following are true about Chronic starvation except?

A. Exhaustion
B. Hyperthermia Hypothermia
C. Heart Atrophy
D. Hypotension

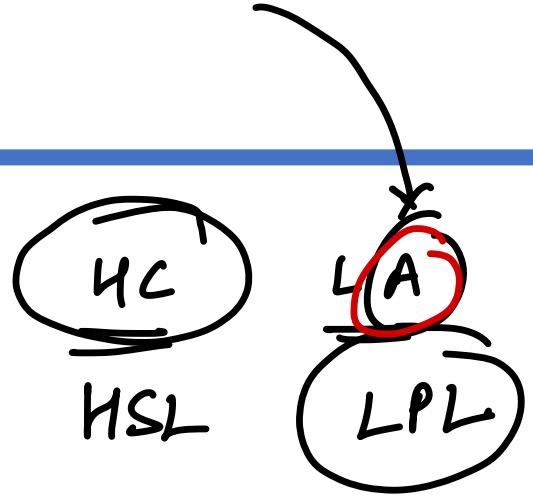
. GB distension

9. The method of autopsy shown in the image is?

A. Virchow technique
B. Rokitansky technique – in situ
C. Ghon technique → en block
D. Letulle technique → en masse

10. Which of the following is seen in low insulin: glucagon ratio?

A. Activation of lipoprotein lipase
B. Activation of glycogen synthase
C. Activation of phosphofructokinase-1
D. Activation of hormone-sensitive lipase

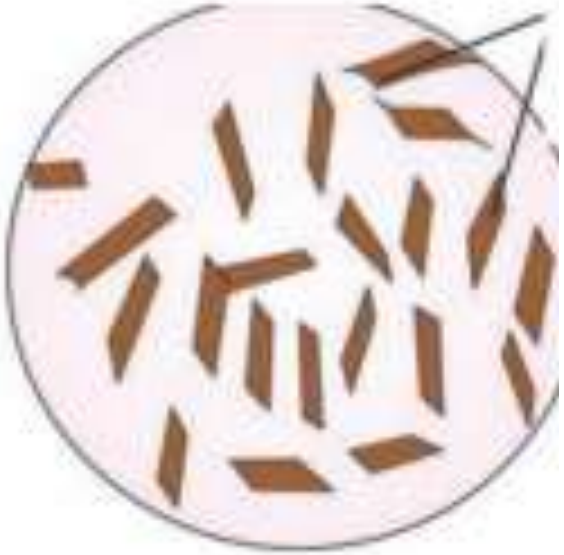


11. A 3-year-old, previously healthy boy is brought to the emergency department due to accidental drug ingestion. His mother found him playing with his grandfather's pill bottles earlier today, and later, he developed nausea and vomited twice. The patient also began breathing rapidly and appeared ill. His grandfather recently had a myocardial infarction and takes multiple medications. Laboratory studies reveal high anion gap metabolic acidosis. Treatment with intravenous sodium bicarbonate infusion is begun. This therapy is most likely to provide a beneficial effect via which of the following mechanisms?

A. Decreasing cardiotoxic effects of the drug
B. Decreasing charged form of the drug in plasma
C. Increasing drug trapping in the gastric lumen
D. Increasing excretion of the drug in the urine

12. A 10-year-old male child came to the casualty with difficulty in walking and pain in the perianal region. On subjecting the specimen from the perianal region to a test, the following dark brown rhombic crystals are seen under the microscope. What is the test done?

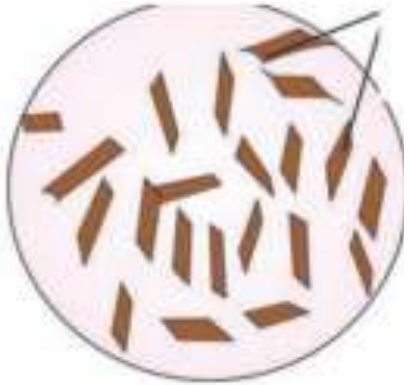
A. Barberio's test
B. Florence test
C. Teichmann test
D. Acid phosphatase test



Semen

Florence

KI + Choline

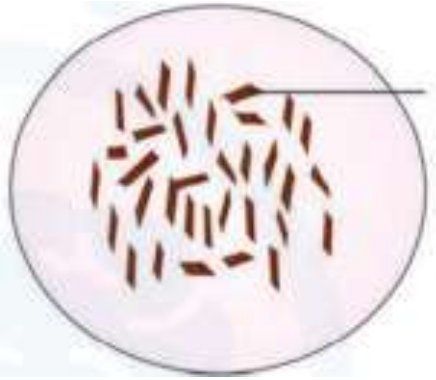


Barberio

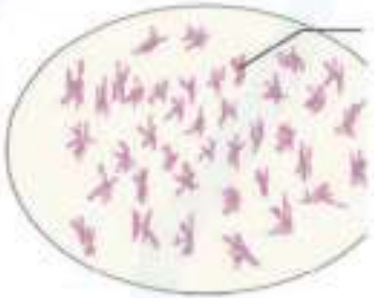
S P

yellow

Blood



Teichmenn (hemin crystals)



Takayama (hemochromogen crystals)

13. Which of the following compounds is needed for all the following reactions?

1. Norepinephrine to Epinephrine
2. Ethanolamine to Choline
3. Acetyl serotonin to Melatonin
4. Guanidinoacetate to Creatine

methyl ⁿ

A. Methyl cobalamin
B. Acetyl CoA
C. S-Adenosyl Methionine
D. S-Adenosyl Serine

methyl donor SAM

14. An accused died in lock up during the police interrogation. Enquiry in this case will be done by?

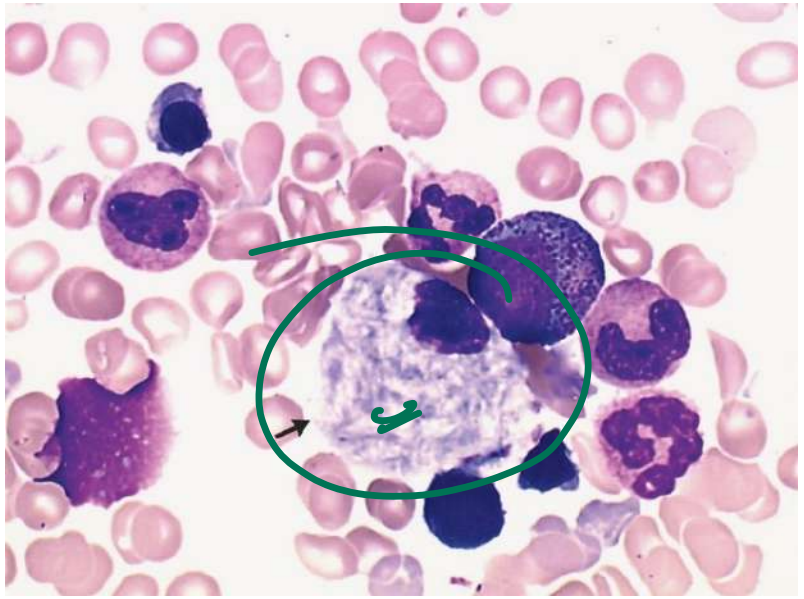
A. Judicial Magistrate
B. Executive magistrate
C. Police IG
D. Both a and b

→ Dowry death
→ Exhumation

CrPC → 176

15. A child presents with bone pain and hepatosplenomegaly. A trephine biopsy show the following finding. Which of the following is the most likely enzyme deficient in this condition?

A. Hexosaminidase A
B. Glucocerebrosidase
C. Sphingomyelinase
D. α-1,4-Glucosidase



Gaucher's

16. A 35-year-old man with a history of bipolar and substance use disorders comes to the emergency department due to depression, auditory hallucinations, and suicidal ideation. His medications include lithium and escitalopram. The patient has a history of 5 psychiatric hospitalizations and 2 past suicide attempts, including overdose on his medications and attempted hanging. The patient has been using "anything I can get my hands on" because his depression is unbearable. He is hospitalized and placed on suicide precautions. His dose of escitalopram is increased to target his depression, and risperidone is added to treat the hallucinations. His lithium level is 1.0 mEq/L. On the second day of hospitalization, the patient reports muscle pains, abdominal cramping, nausea, and diarrhea. His temperature is 37.2 C (99 F), blood pressure is 130/85 mm Hg, and pulse is 84/min. The patient is alert and restless, and his pupils are dilated bilaterally. Bowel sounds are hyperactive and neurologic examination is normal. Which of the following is the most likely explanation for his symptoms?

A. Serotonin syndrome — CLONUS + AMS
B. Cocaine withdrawal ✗
C. Lithium toxicity ✗
D. Opioid withdrawal — cold turkey

17. A patient from Kota has fluorosis and typical brown staining of teeth as shown in the given image. Which bony change will occur in this patient?

A. Osteosclerosis
B. Osteopetrosis
C. Osteoporosis
D. Osteomalacia

18. What is the function of HSP-70?

CHAPERONE

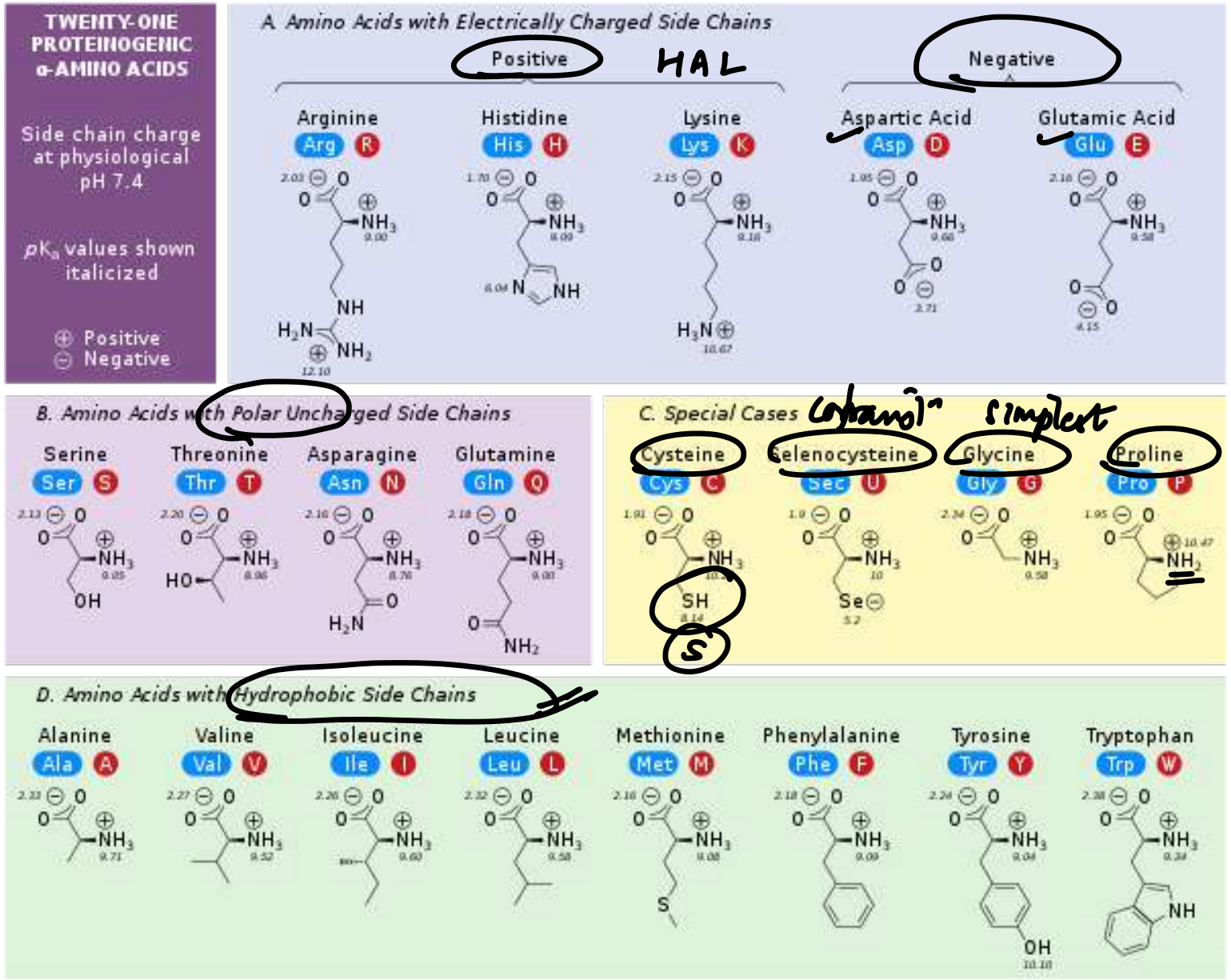
A. Ubiquitinization of protein
B. Protein modification
C. Protein folding
D. Protein cleavage

19. IPC Section 314 deals with?

A. Abortion with consent of mother – 312
B. Abortion without consent of mother – 313
C. Abortion leading to death of mother – 314
D. Preventing the child from being born alive

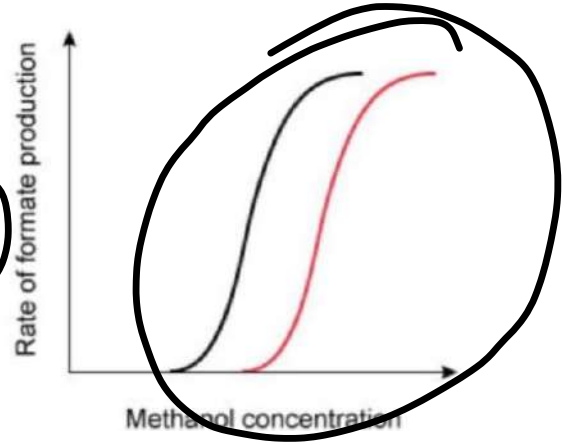
20. Which of the following is responsible for the negative charge in fibrinopeptide A?

A. Glutamate and Valine
B. Histidine and Lysine
C. Aspartate and glutamate
D. Serine and Threonine

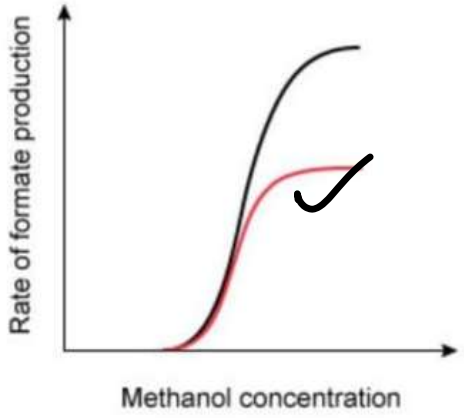

TWENTY-ONE PROTEINOGENIC α-AMINO ACIDS
Side chain charge at physiological pH 7.4
pKa values shown italicized
⊕ Positive
⊖ Negative
A. Amino Acids with Electrically Charged Side Chains
Positive
Negative
Arginine
Arg R
Histidine
His H
Lysine
Lys K
Aspartic Acid
Asp D
Glutamic Acid
Glu E
B. Amino Acids with Polar Uncharged Side Chains
Serine
Ser S
Threonine
Thr T
Asparagine
Asn N
Glutamine
Gln Q
C. Special Cases
Cysteine
Cys C
Selenocysteine
Sec U
Glycine
Gly G
Proline
Pro P
D. Amino Acids with Hydrophobic Side Chains
Alanine
Ala A
Valine
Val V
Isoleucine
Ile I
Leucine
Leu L
Methionine
Met M
Phenylalanine
Phe F
Tyrosine
Tyr Y
Tryptophan
Trp W

21. A 42-year-old man is brought to the emergency department due to nausea, vomiting, and blurred vision. He was making his own whiskey with a home moonshine still and started feeling sick after sampling the first several ounces of distillate. Funduscopic evaluation reveals optic disc hyperemia. Laboratory results show a high anion gap metabolic acidosis. He is started on fomepizole, a medication that transiently binds to alcohol dehydrogenase. Which of the following graphs most accurately portrays the change in enzyme kinetics after administration of the antidote?

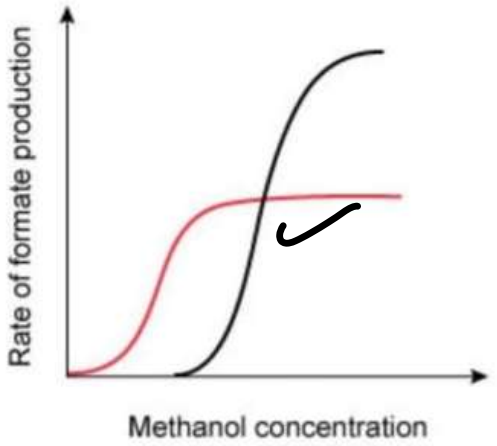
A



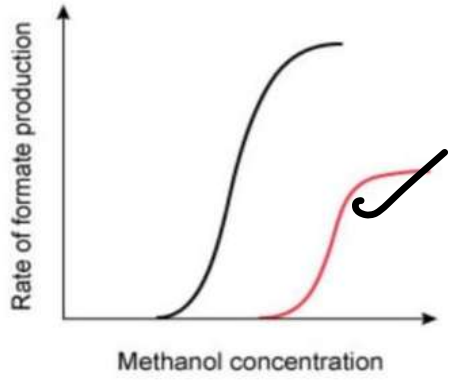
B



C



D



22. 15-year-old boy is brought to the emergency department due to worsening rash and profuse sweating for the past week. He has also felt generally unwell, with difficulty sleeping and sensitivity to light. Skin examination is significant for an erythematous maculopapular rash over the torso, thighs, and upper arms, as well as pink macules over the palms and soles with associated desquamation. Neurologic examination shows a slight tremor. Excessive exposure to which of the following is most likely responsible for this patient's presentation?

A. Phosphorus
B. Lead
C. Marijuana
D. Mercury

23. Identify the correct statements:

1. Serotonin is also known as 5-hydroxytyramine
2. Anaerobic glycolysis of glycogen produces 3 ATPs per unit glucose consumed
3. Flipped LDH ratio implies LDH1 > LDH 2
4. Hexokinase I is released from the hypothalamus

A. 1,2,3,4

B. 2,3,4

C. 2,3

D. 1,4

Hexokinase type I: Major isoform in the **brain.**

Hexokinase type II: Predominant in the **insulin-sensitive tissues**

Hexokinase type III: Not predominant in any tissue.

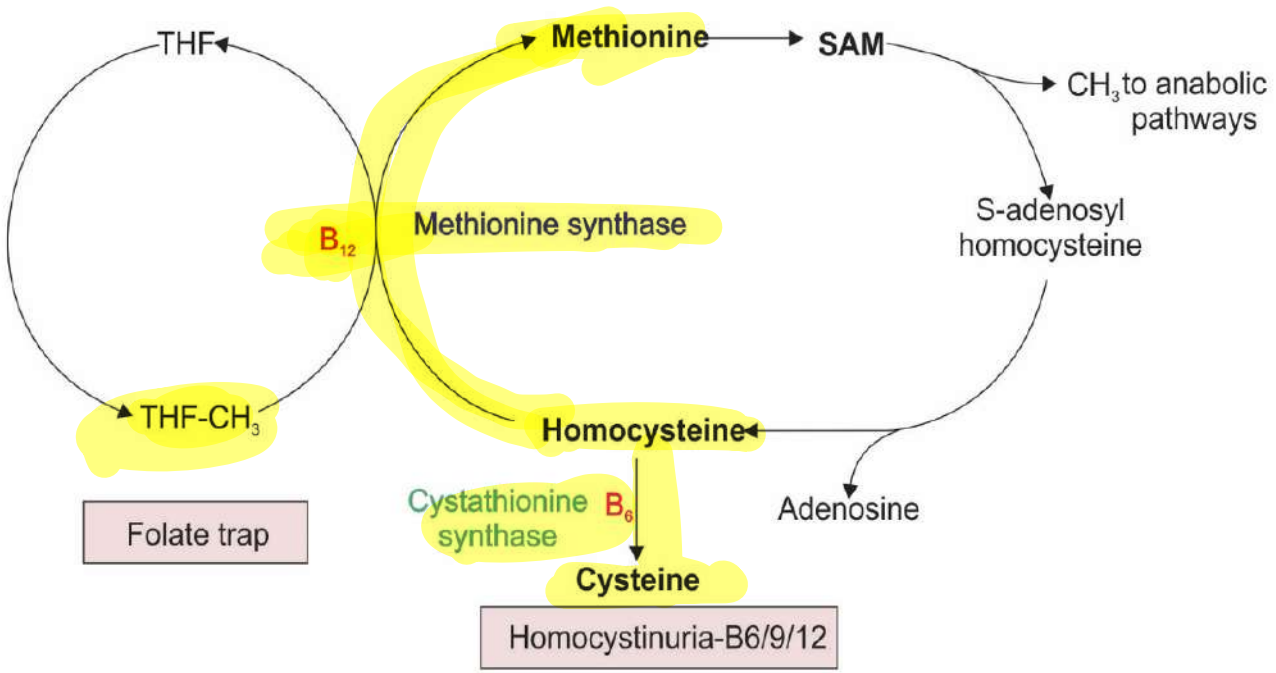
Hexokinase type IV: Primarily to the liver and pancreas.

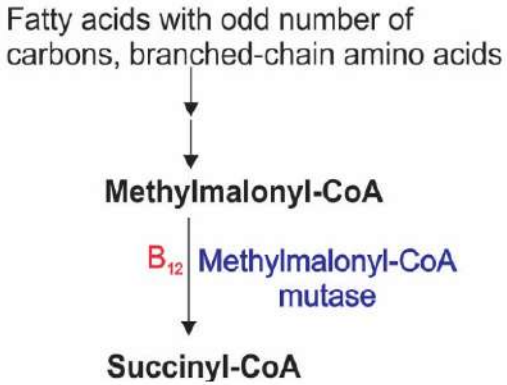
24. The temperature of a body of a deceased person is found to be 39 degrees Celsius. All of the following maybe causes except?

A. Stychnine poioning
B. Datura
C. Duret hemorrhages
D. Intraabdominal hemorrhage

25. 34-year-old previously healthy man comes to the emergency department due to a 3-hour history of chest pain, diaphoresis, and dyspnea. He does not smoke, exercises regularly, and eats a balanced diet. His father died at age 56 from a myocardial infarction. ECG shows ST elevation in the anterolateral leads. Coronary angiogram reveals proximal left anterior descending artery stenosis and thrombosis, which is treated with angioplasty and stent placement. Laboratory results are as follows:
Total cholesterol: 160 mg/dL
Glucose, serum: 98 mg/dL
Homocysteine, plasma: 21.5 umol/L (normal: 4-14 pmol/L)
Further testing reveals a homozygous mutation in the methylene tetrahydrofolate reductase gene that leads to decreased enzymatic activity. Due to this defect, the patient most likely has impairment converting homocysteine to which of the following?

A. Cystathionine
B. Cysteine
C. Methionine
D. Methylmalonyl-CoA


THF
Methionine
SAM
CH_3 to anabolic pathways
B_{12}
Methionine synthase
S-adenosyl homocysteine
$THF-CH_3$
Homocysteine
Adenosine
Cystathionine synthase
B_6
Folate trap
Cysteine
Homocystinuria-B6/9/12

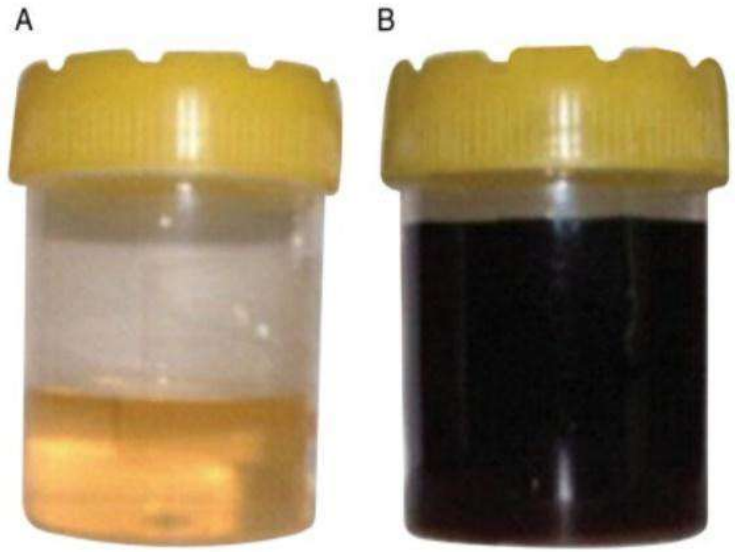

Fatty acids with odd number of carbons, branched-chain amino acids
Methylmalonyl-CoA
B_{12}
Methylmalonyl-CoA mutase
Succinyl-CoA

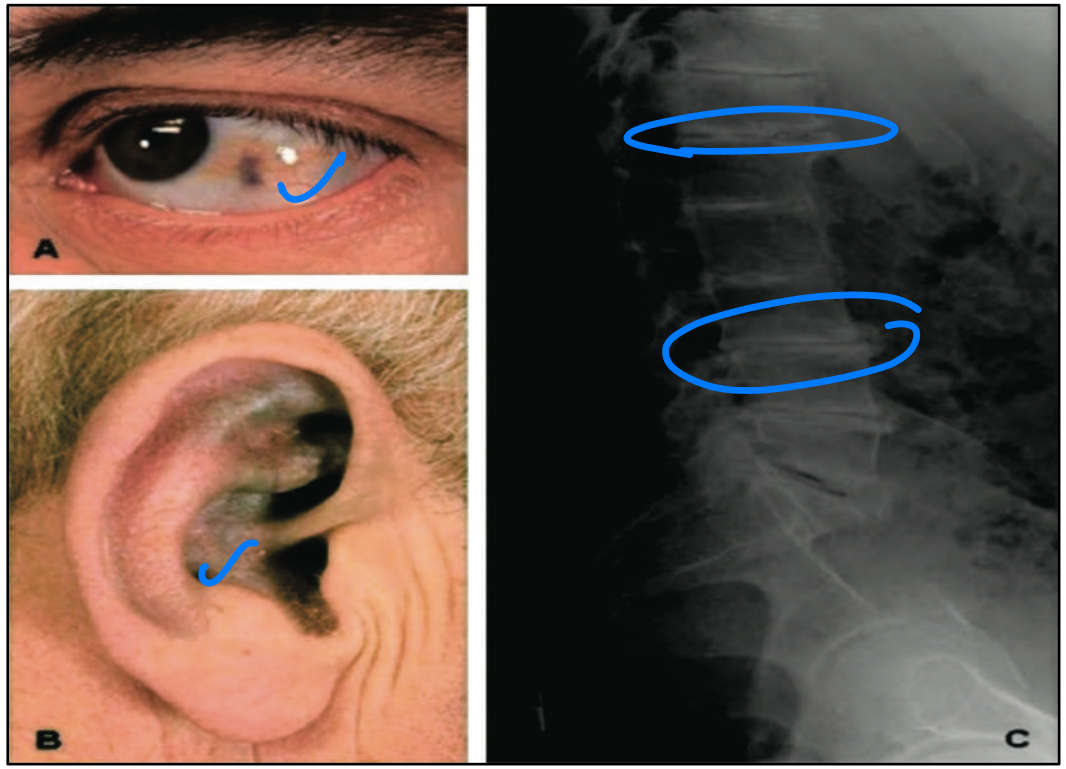
26. Identify the type of injury shown in the picture below:

A. Incised looking laceration
B. Incised wound
C. Lacerated wound
D. Stab wound

27. The lab technician notices a urine sample from a 4-year-old male that was normal on collection but turns into the color shown in the image after a few hours. Deficiency of which of the following can cause this condition?

A. Beta-carotene
B. Tyrosine aminotransferase
C. L-ascorbic acid
D. Homogentisic acid oxidase



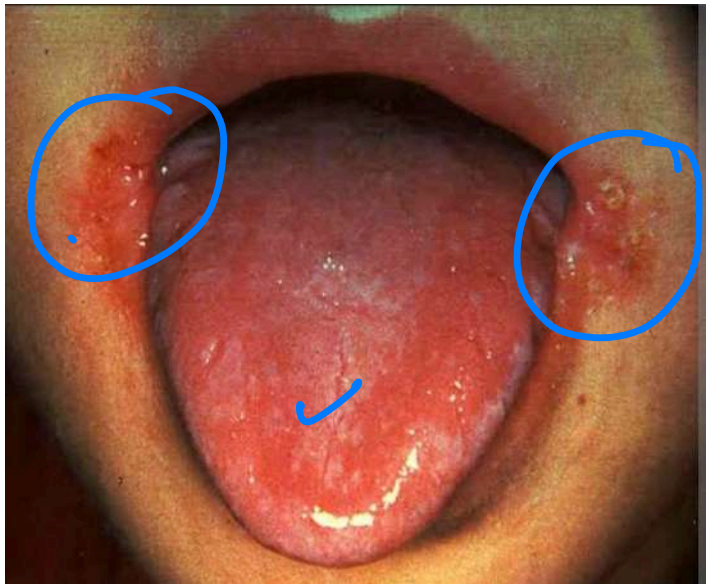


je dise Ca^{2+}

28. A 5yr young boy presented with the following manifestation. Which assay is most appropriate?

A. RBC glutathione reductase
B. RBC NAD
C. RBC transketolase
D. Xanthenuric assay

B2



29. A farmer was sleeping in the field, and he felt a sting on his leg. He saw something moving away quickly. He then got drowsy and was taken to the hospital. He developed pain around the site and continued to bleed profusely from the wound site. The wound became red with blisters. Which of the following is the most likely cause?

A.

C.

Scorpion

→ autonomic storm
DOL Prazosin

B.

D.

Cobra

Common krait

30. Which of the following should be avoided by a patient of trimethylaminuria?

Fishy odour

A. Biotin
B. Choline
C. Niacin
D. Pantothenic acid

- Choline
- Carnitine

FMO 3

Flavin containing monooxygenase 3

31. Identify the incorrect statements

1. Spider and scorpion bites may produce a catecholamine storm
2. Edmond Locard is known for study of fingerprints
3. Posthumous child can be best defined as delivery of a macerated fetus
4. Basiocciput fuses with basisphenoid at 18-22 years

A. 1,2,3,4

B. 2,3

C. 1,4

D. 1,2,3

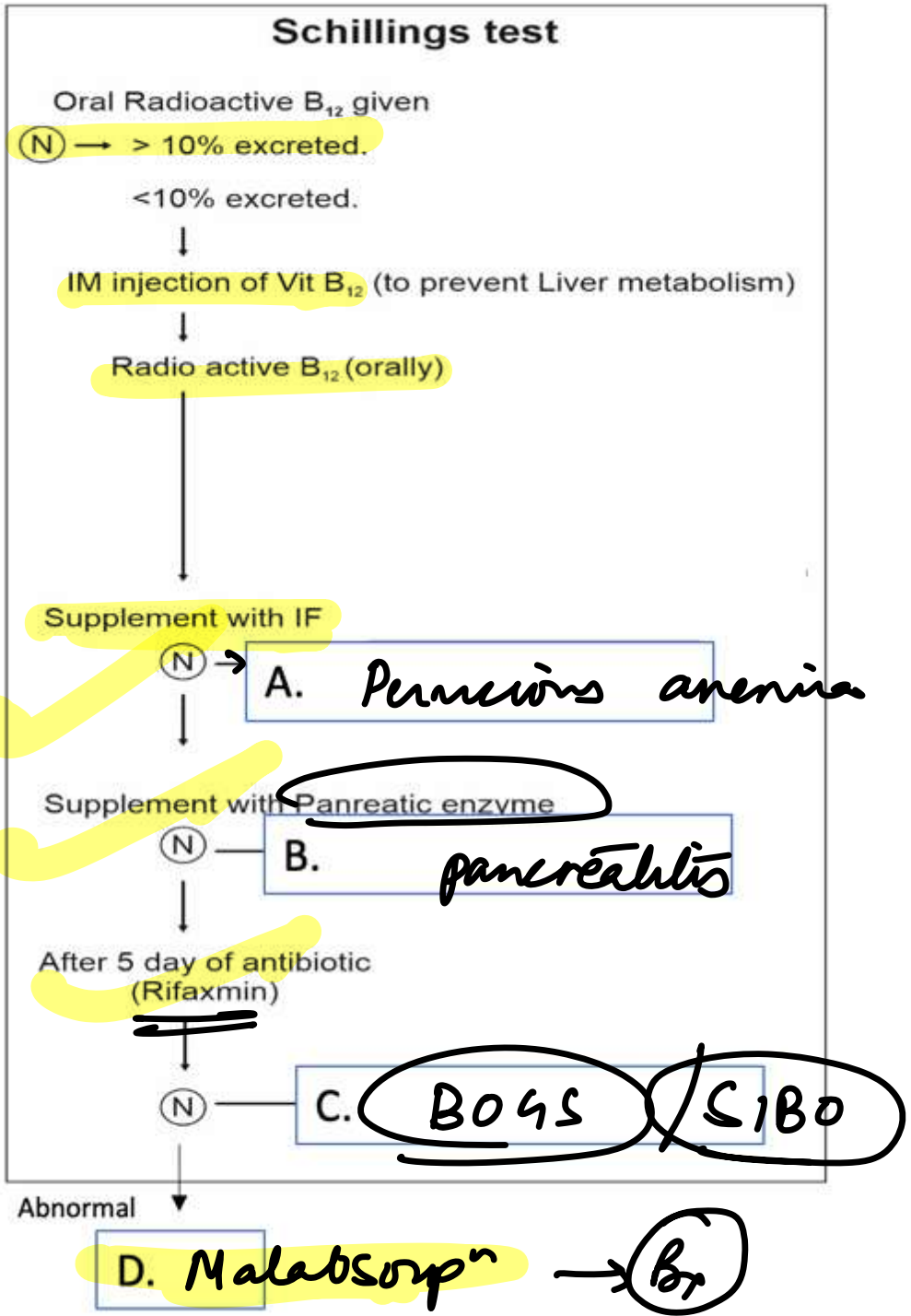
32. Identify A, B, C, D

A. A-Pancreatitis, B-Pernicious anemia, C-BOGS, D-Liver failure

B. A-Renal failure, B-Pernicious anemia, C-Malabsorption, D-BOGS

C. A- Pernicious anemia, B- Pancreatitis, C-Liver failure, D-Malabsorption

D. A-Pernicious anemia, B- Pancreatitis, C-BOGS, D-Malabsorption

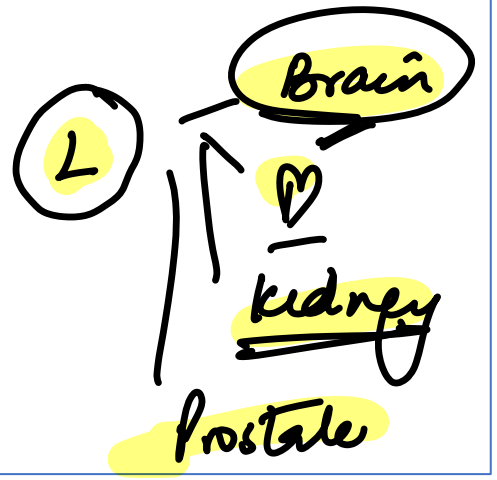


33. Which organ is the earliest to undergo putrefaction from the given options?

A. Brain
B. Heart
C. Kidney
D. Prostate

The order of organ putrefaction (early to late) is as follows:

I. Larynx and trachea
II. Liver and lungs
III. Brain
IV. Heart
V. Kidney
VI. Prostate and Non-Gravid uterus
VII. Skin, muscle, tendons
VIII. Bones and teeth



34. Identify the test which follows the principle 'Prior knowledge of the events/activity will influence the suspect's reaction'?

CHECK

A. Truth Serum
B. Polygraph
C. Hypnosis
D. Brain mapping - EEG

35. Match the following:

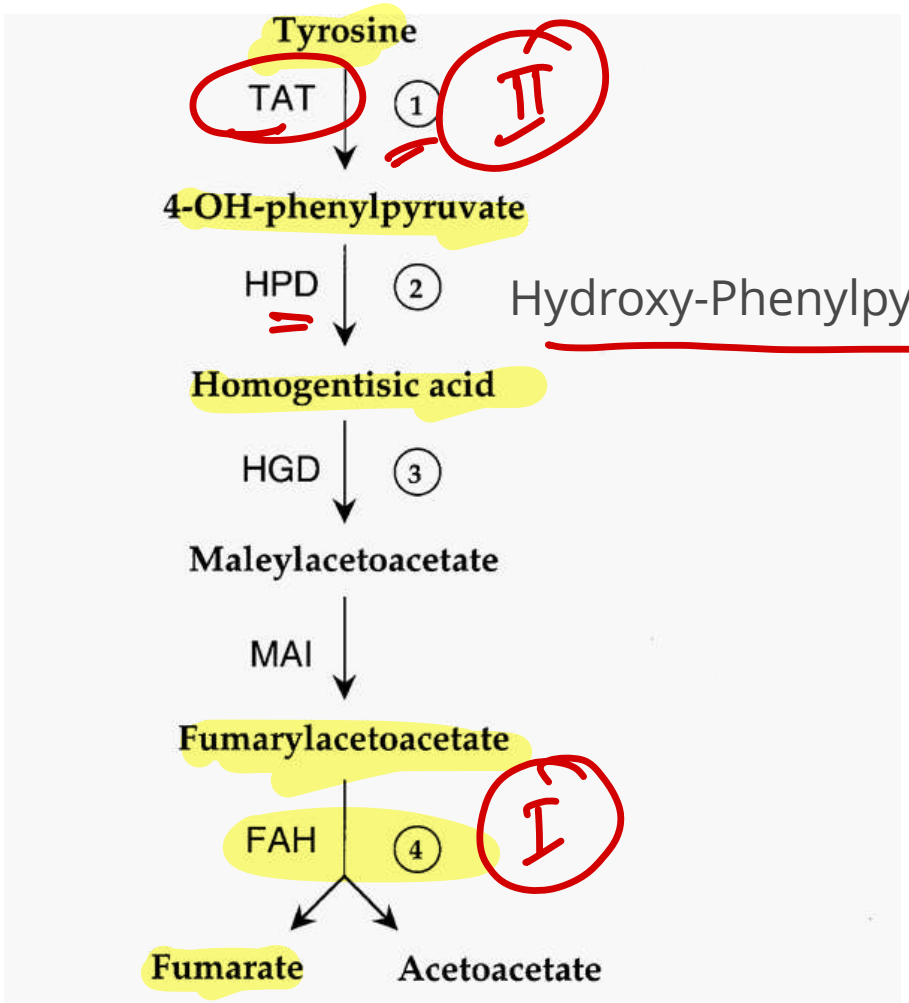
A. Tyrosinemia Type I	1. tyrosine transaminase
B. Tyrosinemia Type II	2. para-hydroxyphenylpyruvate hydroxylase
C. Tyrosinemia Type III	3. fumaryl acetoacetate hydrolase
D. Galactosemia	4. Galactose-1-phosphate uridyl transferase
	5. Galactokinase

A. A-1, B-2, C-3, D-4

B. A-1, B-2, C-3, D-5

C. A-3, B-2, C-1, D-4

D. A-3, B-1, C-2, D-4

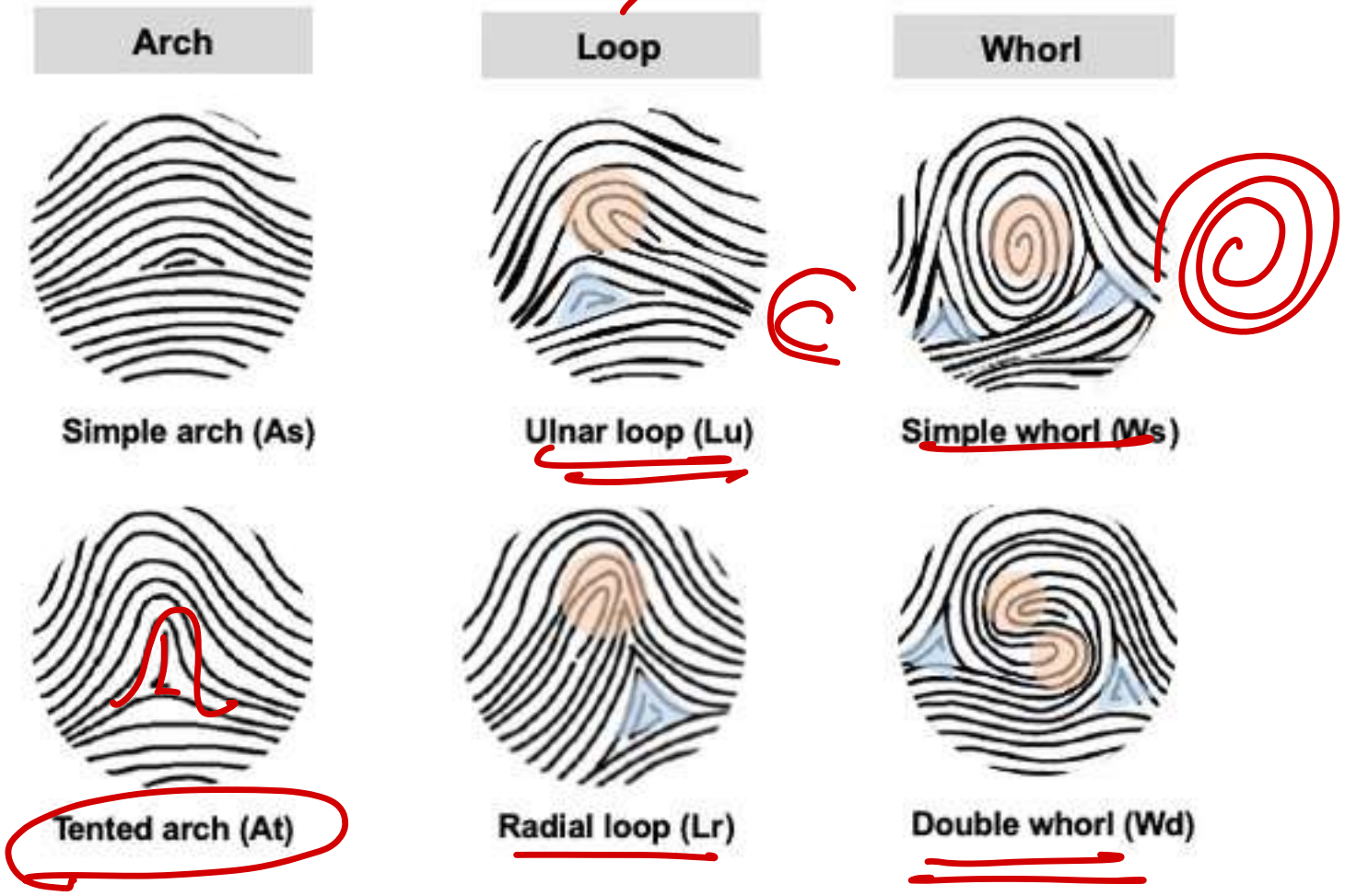


Hydroxy-Phenylpyruvate-Dioxygenase

1. Tyrosinemia type II: Corneal ulcers, hyperkeratosis
2. Tyrosinemia type III: Mental retardation
3. Alkaptonuria: Arthritis, black urine
4. Tyrosinemia type I: Liver and renal disease, cancer

36. Identify the human fingerprint shown below?

A. Whorl
B. Arch
C. Loop
D. Composite


Arch
Loop
Whorl
Simple arch (As)
Ulnar loop (Lu)
Simple whorl (Ws)
Tented arch (At)
Radial loop (Lr)
Double whorl (Wd)

37. A 40-year-old farmer is brought to the emergency department due to an alleged suicide attempt. On physical examination, the patient is diaphoretic. The pupils are pinpoint and unreactive, and significant tearing is noted. Diffuse rhonchi and wheezing are present in the lungs bilaterally. Muscle strength is diminished throughout, and fasciculations are noted in the extremities. First-line therapy is administered, but the patient remains weak. Treatment with which of the following is most likely to improve this patient's current condition?

A. Diphenhydramine
B. Hemodialysis
C. Physostigmine
D. Atropine

38. Which of the following enzymes simultaneously incorporates molecular oxygen and produces water?

A. Catalase $H_2O_2 \rightarrow H_2O + O_2$

B. Cytochrome C oxidase

C. Acetyl CoA carboxylase ✗

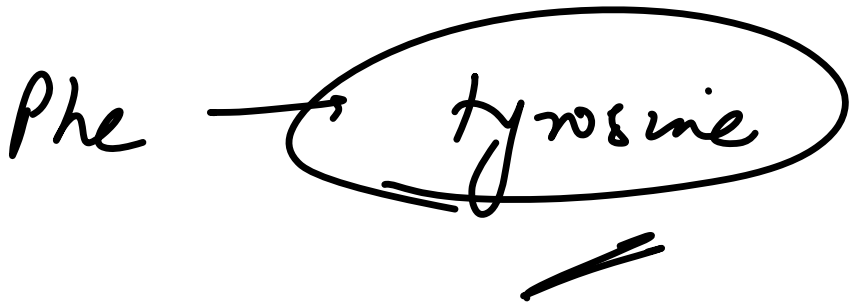
D. Choline esterase ✗

39. Which of the following poisons cause bluish discoloration of the stomach mucosa on postmortem examination?

A. Oxalic acid ×
B. Sodium amytal / Cu – BLUE
C. Phenol ✓ leather
D. Sulphuric acid ✓ bloating paper

40. An autopsy is performed on a 9-month-old boy who died due to refractory seizures. Examination shows microcephaly and skin with diffuse hypopigmentation. Further work-up reveals deficiency of a cofactor required for the formation of neurotransmitters found predominantly in the substantia nigra and locus caeruleus. The absence of this cofactor is most likely to directly affect the function of which of the following enzymes?

A. Branched-chain alpha-ketoacid dehydrogenase
B. Dopamine hydroxylase
C. Homogentisic acid oxidase
D. Phenylalanine hydroxylase



41. A dead body is brought for evaluation. On post-mortem examination, a ligature that was completely encircling the neck, horizontal, and below the level of the thyroid was seen. There was no dribbling of saliva. What is the cause of death?

A. Throttling
B. Ligature strangulation
C. Gagging
D. Hanging

42. Lipotrophic factors are all except?

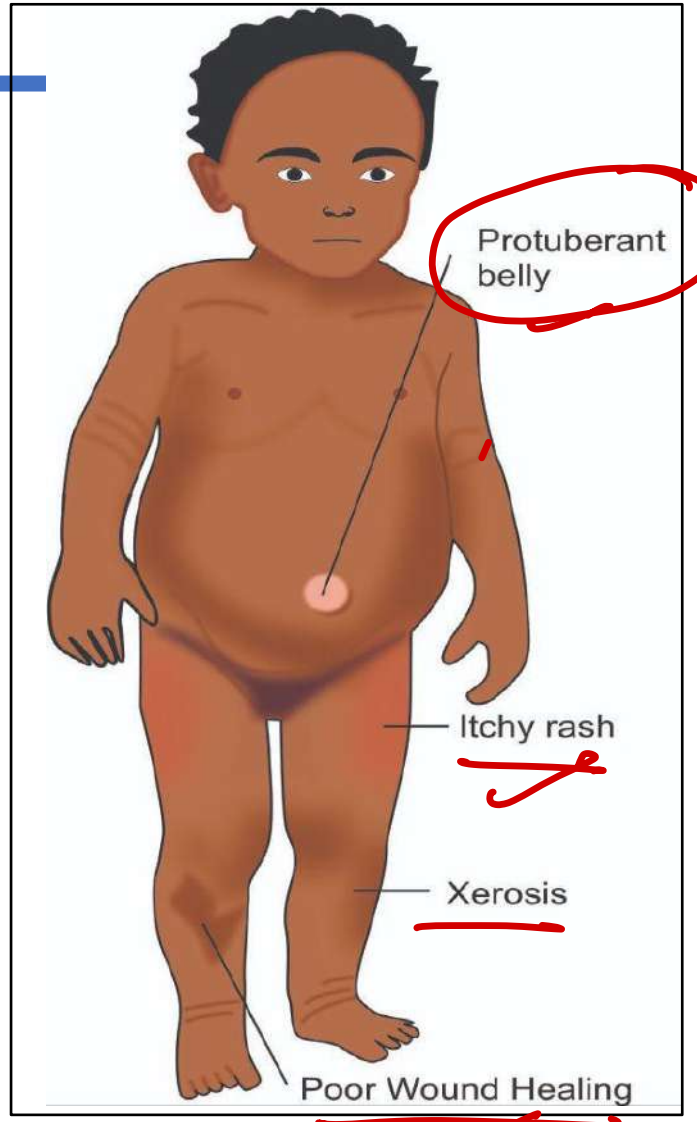
A. Choline
B. Lecithine
C. Arginine
D. Methionine

CML

Lipotrophic factors are substances that help in removal or decrease fat deposition in liver by their interaction with fat metabolism. Common lipotrophic factors are ***choline, methionine, lecithine, glycine serine, inositol, vit E, vitamin B12 and folic acid***

43. Following appearance is seen in:

A. Diabetes
B. Kwashiorkor
C. Marasmus
D. Hypothyroidism



44. A 35-year-old man comes to the office with progressively worsening fatigue associated with dark urine and back pain. Two days ago, the patient ate some large, flat beans brought home by his wife after a business trip to Egypt. Physical examination shows jaundice and pallor. Laboratory results reveal a hemoglobin level of 8 g/dL. Further evaluation reveals deficiency of an enzyme involved in the conversion of glucose-6-phosphate to ribulose-5-phosphate. The substance generated during this conversion is necessary for which of the following biochemical processes?

NADPH

A. ADP phosphorylation
B. Fatty acid synthesis / cholesterol synthesis / oxidative stress
C. Glycogen storage
D. Ketone body synthesis

45. A dermatology researcher is studying the role of different amino acids in wound healing. She cultures mature dermal fibroblasts in growth media. After several days, the fibroblasts begin synthesizing polypeptide chains that assemble into triple helical structures, followed by fibrils. The fibrillar proteins are hydrolyzed and separated into their constituent amino acids via paper chromatography . Which of the following amino acids is most likely to be found in highest quantity in these proteins?

A. Alanine
B. Cysteine
C. Glycine 1/3rd
D. Proline

46. Glycogen synthesis and breakdown takes place in the same cell, having enzymes necessary for both the pathways. Why the glucose-6-phosphate, freshly synthesized during glycogenesis in cytoplasm of hepatocytes, is not immediately degraded by the enzyme glucose-6-phosphatase?

A. The thermodynamics does not favor such a reaction to occur

B. Glucose-6-phosphatase is present in the endoplasmic reticulum and cannot act on glycogen formed in the cytoplasm

C. Glycogenesis and glycogenolysis are tightly regulated such that enzymes of only one of those are present at a time.

D. Steric hindrance due to albumin

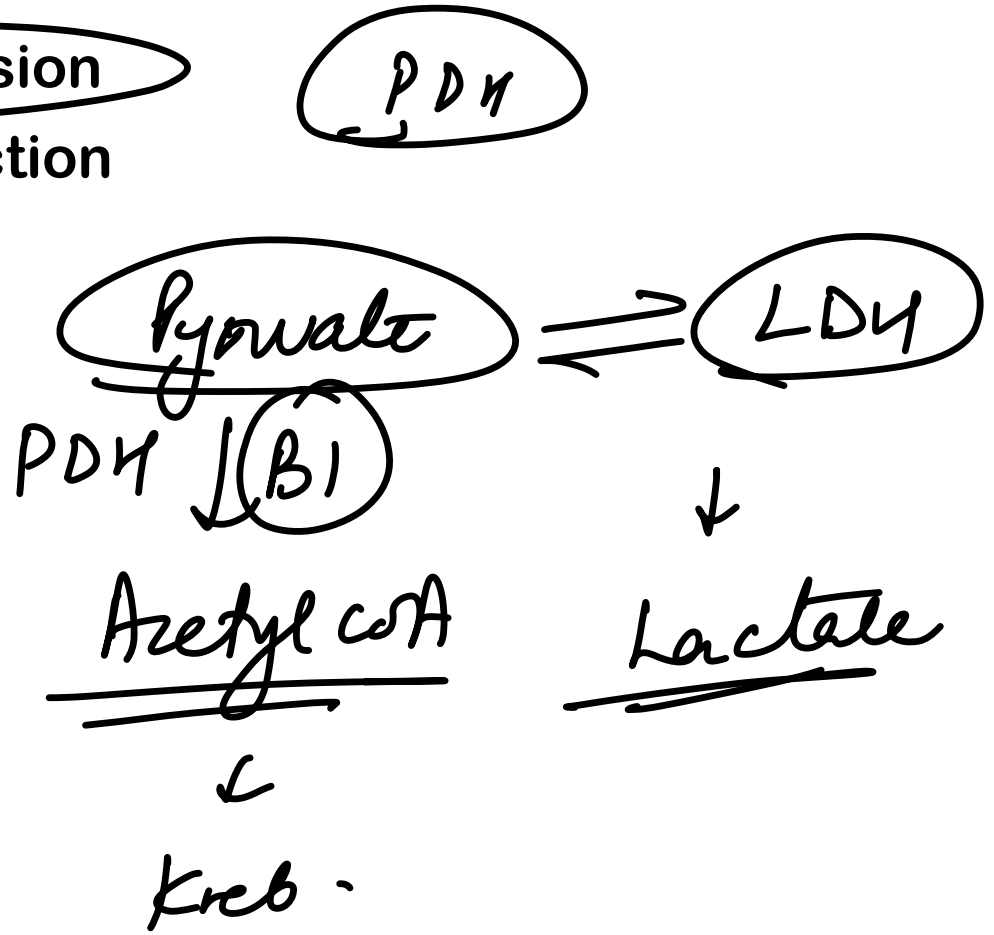
47. 2-month-old boy is is brought to the emergency department due to irritability and vomiting. The patient is exclusively breastfed but has not been tolerating feeds since yesterday. Urine output has decreased. The mother has a history of obesity and had gastric bypass surgery several years prior to pregnancy. Chest radiography reveals cardiomegaly. Further work-up shows impaired carbohydrate metabolism with increased serum levels of lactate and decreased erythrocyte transketolase activity. Which of the following additional enzymes is most likely to have impaired activity in this patient?

B1

A. Alpha-1,4-glucosidase
B. Alpha-L-iduronidase
C. Galactose-1-phosphate uridyltransferase
D. Pyruvate dehydrogenase

48. A 45 year old chronic alcoholic man presented with confusion, ataxia and diplopia. What is the treatment protocol?

A. Vitamin B1 injection followed by glucose infusion
B. Glucose infusion followed by Vitamin B1 injection
C. Glucose infusion alone
D. Thiamine infusion alone



49. A 24-year-old woman comes to the emergency department due to bloody emesis. She had 2 episodes of vomiting bright red blood and feels lightheaded and dizzy. The patient was recently diagnosed with factitious disorder after being hospitalized multiple times for a myriad of symptoms and undergoing several invasive procedures. Physical examination shows scattered ecchymoses. The abdomen is soft and nontender. Rectal examination shows maroon-colored, guaiac-positive stool. After much questioning, she admits to having ingested rat poison several days ago. Immediate treatment of this patient should include which of the following?

A. Cryoprecipitate – fg, 13, vWF
B. Fresh frozen plasma
C. Platelet transfusion
D. Protamine sulfate – Heparin

Zn P

'FOBT'

warfarin

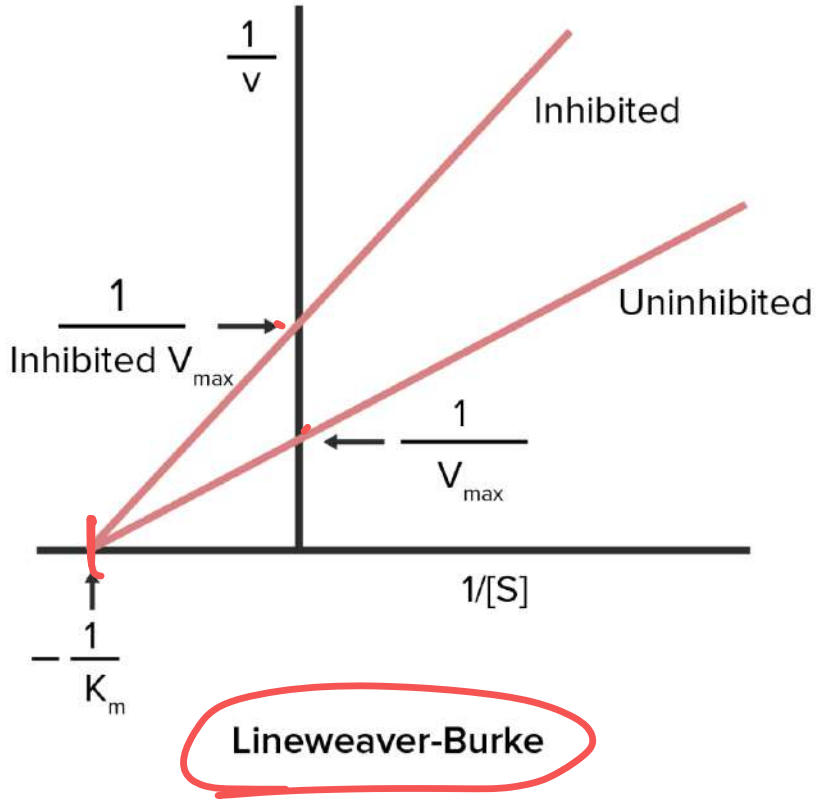
2, 7, 9, 10

50. Which of the following diseases have autosomal recessive inheritance?

A. Albinism
B. G-6-PD deficiency – XLR
C. Marfan's syndrome – AD
D. Lesch-Nyhan syndrome – XLR

51. The following graph is most likely to be seen in:

A. Non-competitive inhibition
B. Competitive inhibition
C. Un-competitive inhibition
D. Allosteric inhibition



52. Identify the correct statements:

1. In a patient with Wilson's disease, 3-methylhistidine is decreased in urine.
2. Direct positive Van der bergh's reaction is seen in a case of obstructive jaundice.
3. If the percentage of thymine residues in DNA is 28%, percentage of cytosine is 22%
4. Thermogenin is present in the mitochondria.

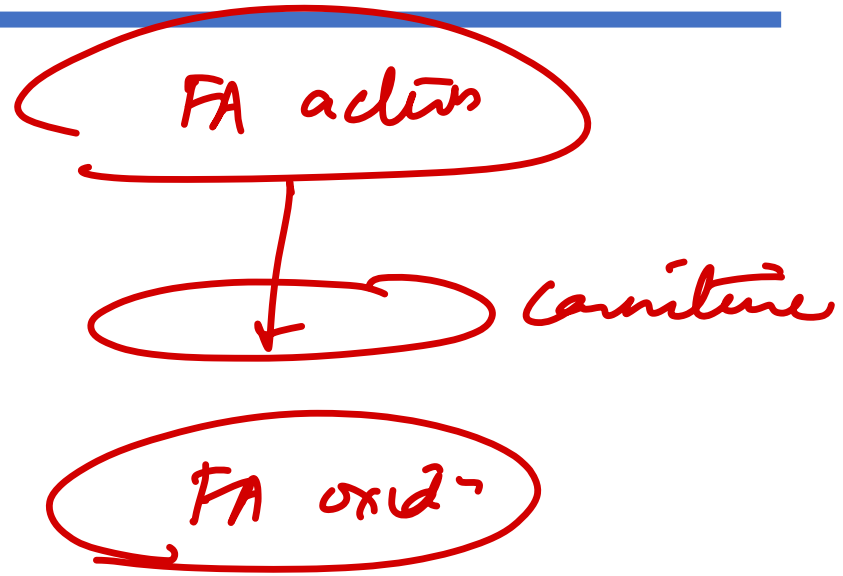
A. 1, 2, 3, 4
B. 1, 2, 3
C. 2, 3, 4
D. 1, 4

Van den Bergh reaction

a. The serum of the patient is mixed with diazo reagent. If a red color develops immediately, it is called a **direct positive**. It happens if **conjugated bilirubin** is present.
b. In an **indirect** positive test, the patient's serum is first treated with alcohol and later mixed with diazo reagent. This causes development of a red color. It is seen if **unconjugated** bilirubin is present.
c. If both conjugated and unconjugated bilirubin are present the reaction is termed a biphasic reaction.

53. Which of the following helps in the transport of fatty acids across the inner mitochondrial membrane?

A. Acyl carrier protein
B. Carnitine
C. Lecithin-cholesterol acyltransferase
D. Carnitine and albumin



54. Match the following:

A. Obtaining sexual pleasure by wearing clothes of opposite sex	Frotteurism
B. Desire to seek surgery to become member of opposite sex	Eonism
C. Sexual gratification by rubbing his private parts against another person	Exhibitionism
D. Exposure of one's genitals to an unsuspecting stranger	Transsexualism

A. A-2, B-4, C-1, D-3
B. A-4, B-2, C-1, D-3
C. A-1, B-2, C-3, D-4
D. A-2, B-4, C-3, D-1

55. Which of the following amino acid is necessary for conversion of nor-epinephrine to epinephrine?

'SAM'

A. Tyrosine
B. Tryptophan
C. Phenyl alanine
D. Methionine

56. In which of the below circumstances does Dying declaration become invalid?

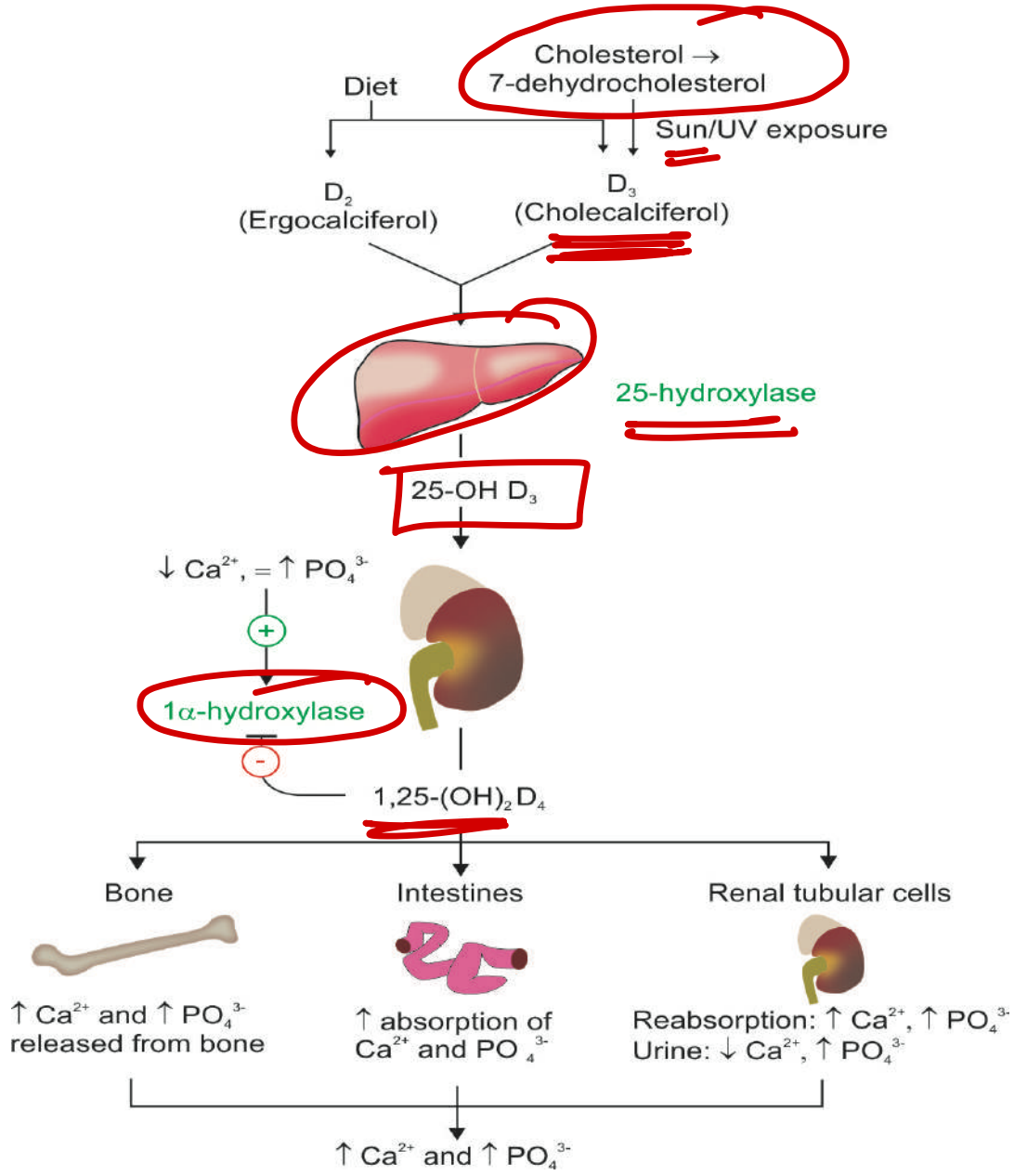
A. Dying declaration recorded by medical officer
B. The victim survive after recording dying declaration.
C. Dying declaration not sign by attendent
D. Dying declaration by police officer

57. Identify the plant shown below?

A. Cocaine
B. Hyoscine
C. Tobacco
D. Tetrahydro-cannabinol

58. Which of the following steps in the metabolism of Vitamin D requires sunlight?

A. 1, 25 dihydroxycholecalciferol to 7-dehydrocholesterol
B. 7-dehydrocholesterol to cholecalciferol
C. Cholecalciferol to 25-hydroxycholecalciferol
D. 25-hydroxycholecalciferol to 1, 25 dihydroxycholecalciferols


Cholesterol → 7-dehydrocholesterol
Diet
Sun/UV exposure
D2 (Ergocalciferol)
D3 (Cholecalciferol)
25-hydroxylase
25-OH D3
↓ Ca2+, = ↑ PO4 3-
+
1α-hydroxylase
-
1,25-(OH)2 D4
Bone
Intestines
Renal tubular cells
↑ Ca2+ and ↑ PO4 3- released from bone
↑ absorption of Ca2+ and PO 4 3-
Reabsorption: ↑ Ca2+, ↑ PO4 3-
Urine: ↓ Ca2+, ↑ PO4 3-
↑ Ca2+ and ↑ PO4 3-

59. Identify the wound:

A. Entry Close range
B. Entry Contact range
C. Entry Intermediate range
D. Exit wound

60. A 6-month-old girl is brought to the OPD by her mother for a check-up appointment. The mother states, "My baby doesn't seem to be growing much despite feeding as often as my previous children I'm worried that something is wrong with her." Height and weight are below the 10th percentile. Physical examination shows hepatomegaly and hypotonia. Laboratory results show hypoglycemia and ketoacidosis. Liver biopsy shows hepatic fibrosis without fat accumulation. Further analysis reveals excessive amounts of limit dextrins within the cytosol of the hepatocytes. Which of the following enzymes is most likely deficient in this patient?

A. Acid alpha-glucosidase
B. Glucose-6-phosphatase
C. Glycogen debrancher enzyme
D. Liver glycogen phosphorylase

61. A 17-year-old girl with a history of depression is brought to the emergency department after attempting suicide. Her parents report that she consumed 2 bottles of insecticide after having an argument with her sister approximately 2 hours prior to the presentation. The patient's symptoms include nausea, vomiting, abdominal pain, and copious watery diarrhea. Her breath has a faint garlic odor, and she has numerous healing linear scars on her forearms. Which of the following medications should be administered immediately?

A. CaNa, EDTA

B. Deferoxamine

C. Dimercaprol

D. Hydroxycobalamin

CHELATORS:

BAL/ Dimercaprol- Hg / As / Pb

DMSA/Succimer- " " "

D-penicillamine- Cu

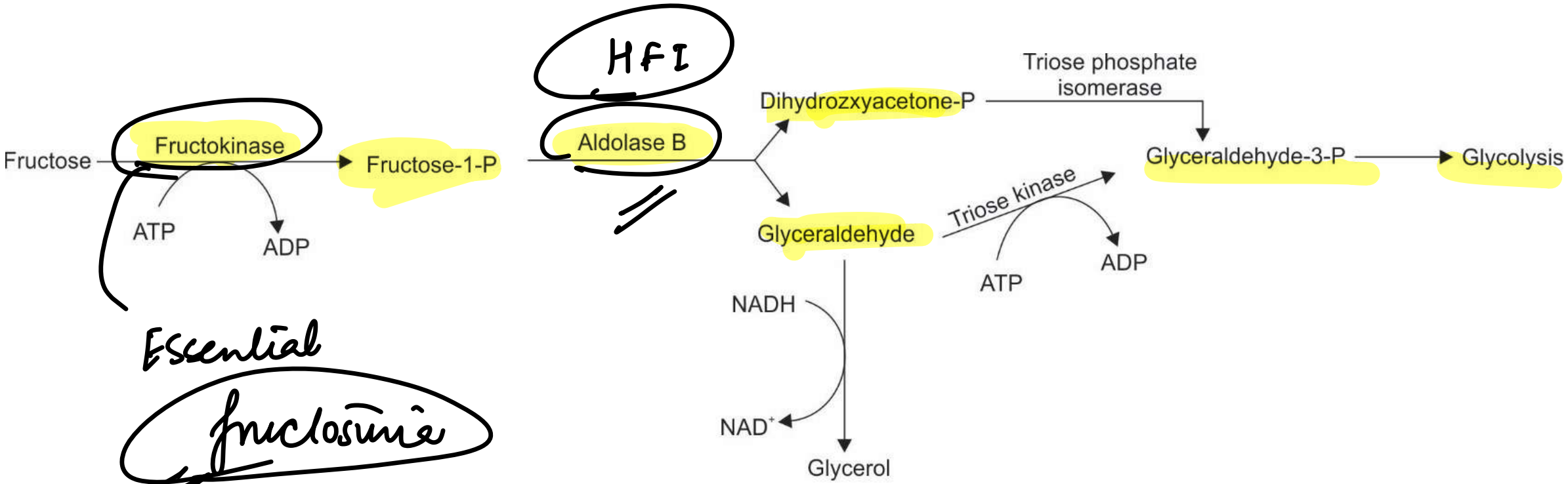
EDTA- Pb

Desferioxamine- Fe

Prussian blue- Th

62. Nutrition researchers investigating the relationship between fructose consumption and cardiovascular disease conduct a prospective cohort study on a population of randomly selected young adults. Study participants undergo semi-annual measurement of waist circumference, blood pressure, and serum cholesterol and triglyceride concentrations. Dietary fructose consumption is assessed through the use of questionnaires and by measuring urinary fructose excretion. A 23-year-old man enrolled in the study is found to excrete large amounts of fructose in his urine compared to other study participants despite maintaining a moderate fructose intake. Further evaluation shows a hereditary defect in fructose metabolism, but he is asymptomatic and has no other medical problems. This patient most likely remains able to metabolize fructose due to the compensatory activity of which of the following enzymes?

A. Aldolase B
B. Aldose reductase
C. Fructokinase
D. Hexokinase



Escential fructosuria

Hexokinase ATP fructose → f-6-p

glycolysis

f, 1, 6 - P

63. Which of the following pathways whose rate limiting enzymes are given occurs only in cytoplasm:

A. Carnitine acyltransferase I
B. HMG-CoA synthase
C. Glycogen phosphorylase
D. Fructose-1, 6-bisphosphatase

64. Match the following:

Preservation for histopathology samples	NACL
Most common Preservation for Viscera for Toxicological analysis	Rectified spirit
Urine	NaF
Blood	Formalin
	Toluene blue

A. A-2, B-1, C-5, D-3

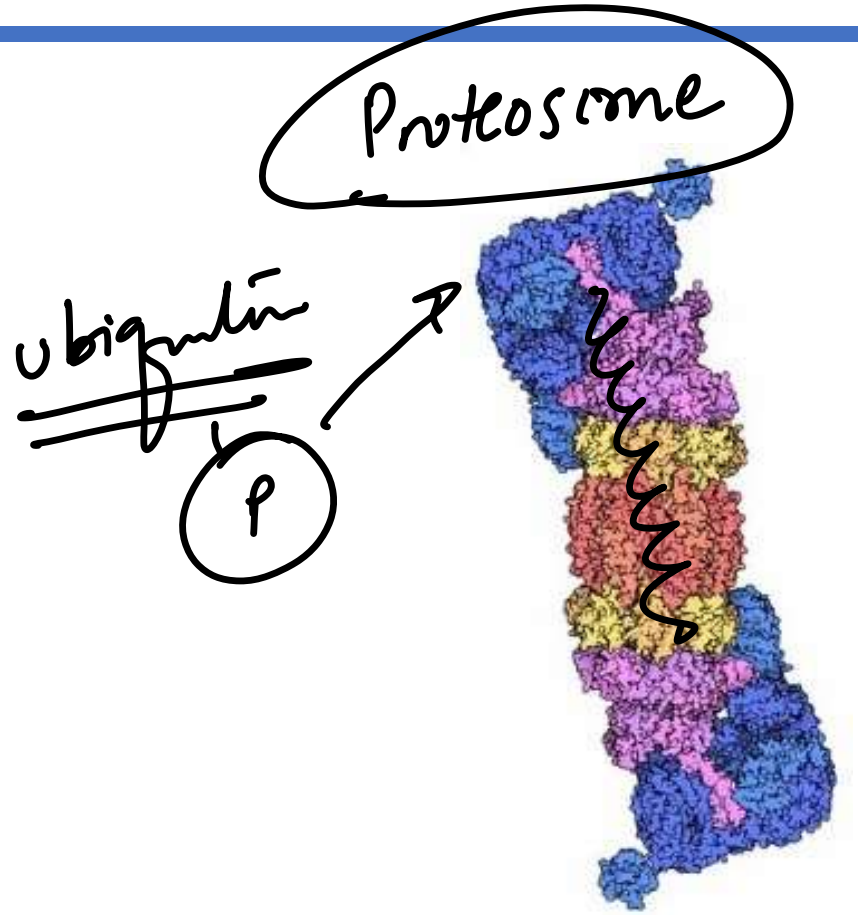
B. A-1, B-2, C-4, D-3

C. A-3, B-5, C-1, D-2

D. A-4, B-1, C-5, D-3

65. What is the function of the structure shown in the image below?

A. Protein folding
B. Post-translational modification
C. Protein degradation
D. Protein sorting



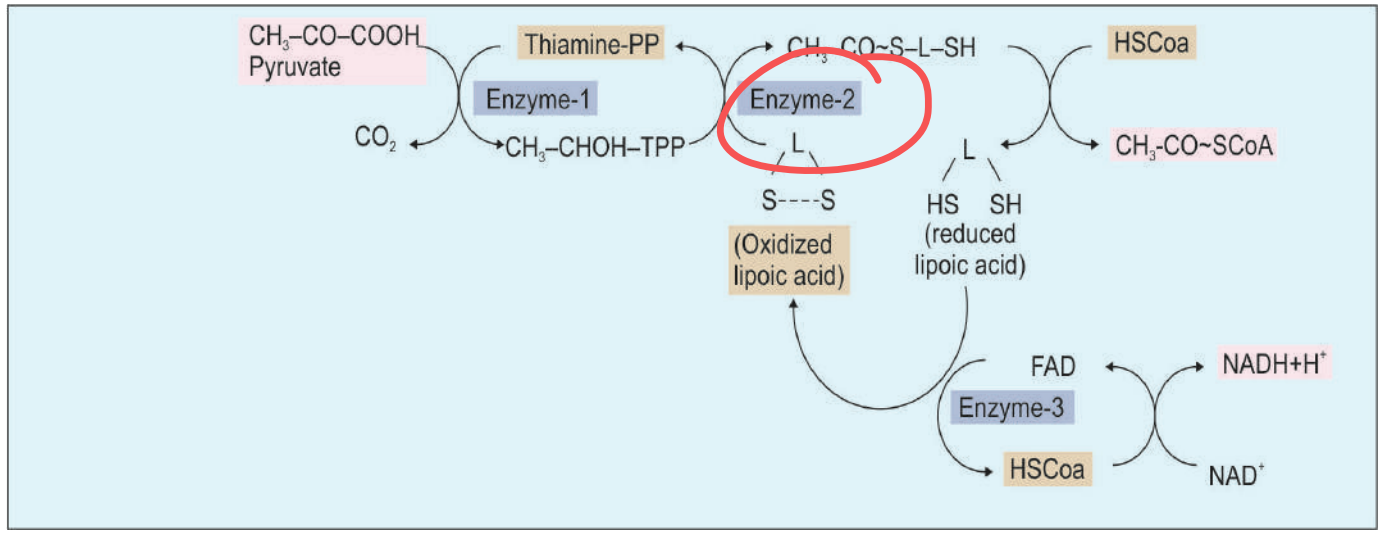
66. A 57-year-old man is brought to the emergency department due to lethargy and altered mental status. His family suspects a suicide attempt. Medical history is significant for dilated cardiomyopathy and major depressive disorder. On arrival, blood pressure is 76/46 mm Hg, pulse is 38/min, and respirations are 16/min. Pupils are 3mm and reactive. Oropharynx is normal. Examination shows bilateral wheezing. There is no peripheral edema. Capillary refill is 3 seconds. There is no diaphoresis. Which of the following categories of medication did this patient most likely ingest?

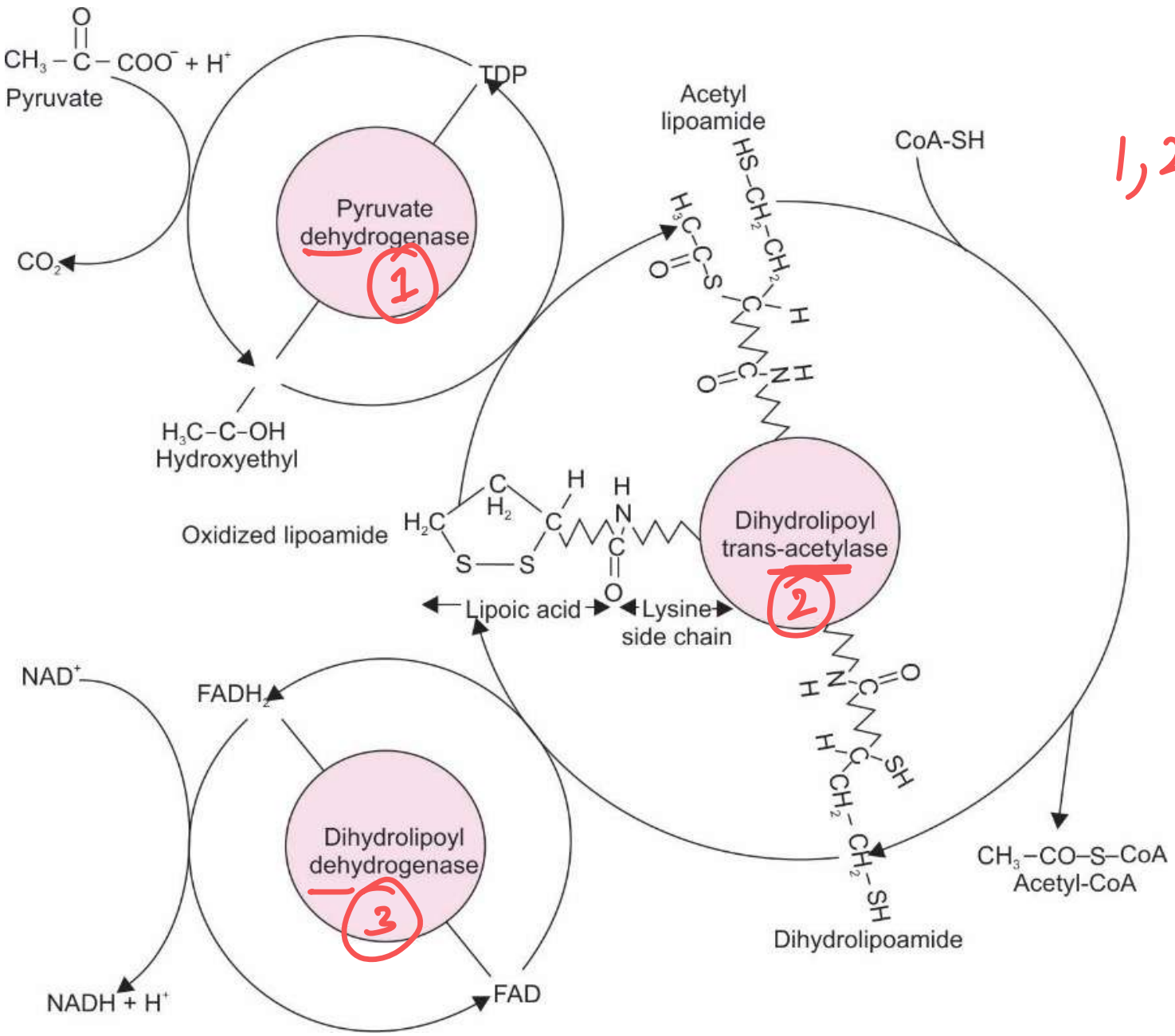
A. Beta blocker
B. Cardiac glycoside
C. Opioid
D. Organophosphate

BP ↓ + HR ↓
- Wheezing
- hypoglycemia

67. The enzymes that convert pyruvate to acetyl CoA are given in the diagram. What are the enzymes marked as E1 and E2 respectively?

A. Pyruvate dehydrogenase and dihydrolipoyl transacetylase
B. Pyruvate carboxylase and dihydrolipoyl transacetylase
C. Pyruvate dehydrogenase and dihydrolipoyl dehydrogenase
D. Pyruvate carboxylase and dihydrolipoyl dehydrogenase





1, 2, 3, 5
Lipoic acid.

FLUSHING

68. A 2-year-old boy is brought to the emergency department due to sudden-onset facial redness. The symptoms were first noticed by the parents about 1 hour ago. The mother also noticed an opened bottle of a vitamin supplement with a few capsules spilled on the floor. This patient most likely ingested a vitamin that has which of the following biochemical functions?

Niacin ↑glycemia

PG ↑

NSAIDs

Flushing

CME

A. Coenzyme in hydroxylation of prolyl and lysyl residues
B. Component of coenzyme A
C. Precursor for flavin adenine dinucleotide production
D. Precursor for nicotinamide adenine dinucleotide production

Vancomycin – Histamine

69. An 18-month-old boy is brought to the OPD due to language regression. He said several words at his 1-year appointment but now no longer speaks any words at all. His moods have also become more unpredictable over the past 4 months with frequent tantrums. The parents tried to bring him in sooner for evaluation, but they live in an impoverished part of the city and experienced financial difficulties with transportation to the office. On physical examination, the boy is quiet and maintains appropriate eye contact throughout the visit. Hemoglobin is 9 g/dL. Which of the following enzymes is most likely inhibited in this patient?

A. 5-Aminolevulinate dehydratase
B. Bilirubin glucuronyl transferase
C. Porphobilinogen deaminase
D. Uroporphyrinogen decarboxylase

70. All of the following amino acids absorb UV light at 250-290m except:

A. Tryptophan
B. Tyrosine
C. Phenylalanine
D. Methionine

aromatic aa

71. In the contributory negligence case who bears the onus of proof?

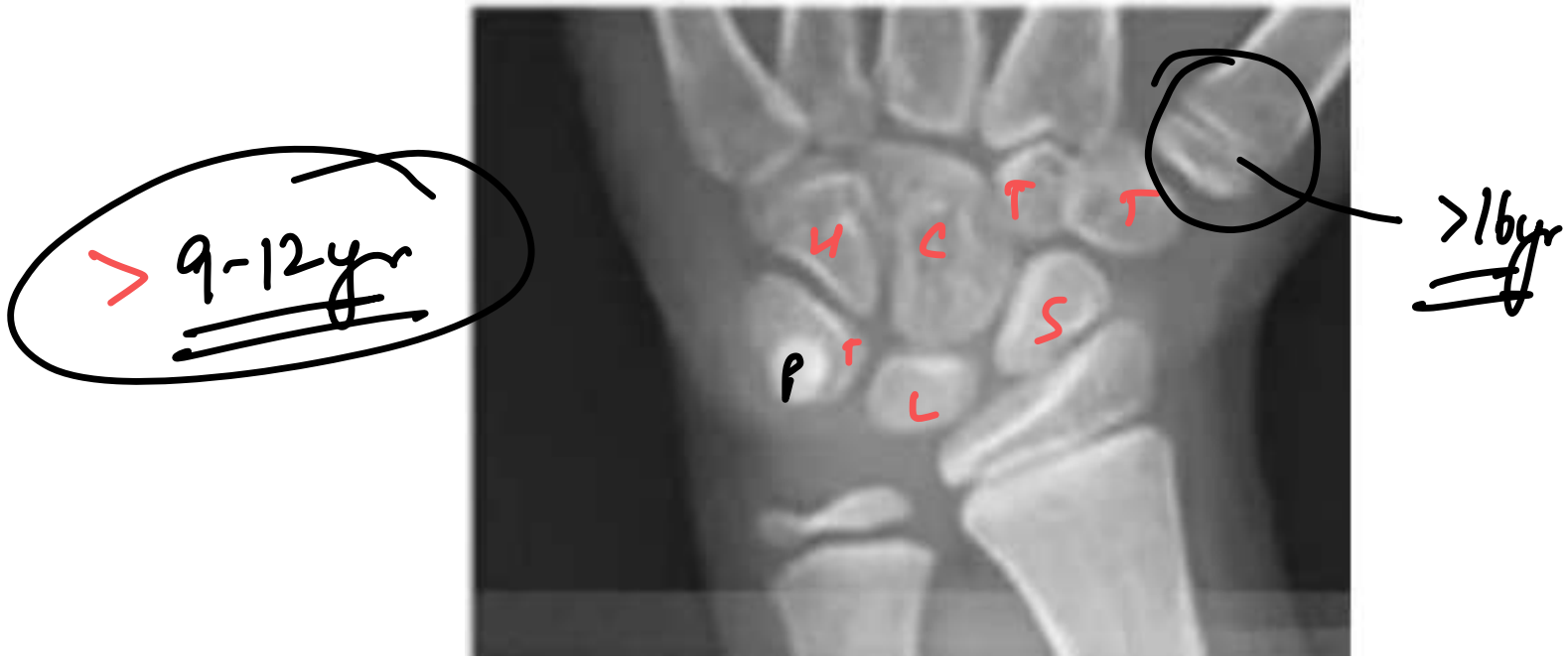
A. Patient
B. Police not under rank of sub inspector
C. Magistrate
D. Doctor

72. Following are the reasons for thiamine deficiency Except:

A. Veganism
B. Chronic alcoholic
C. Chronic use of diuretics
D. Bariatric surgery

73. A child who is a victim under POCSO act is brought to the department of forensic medicine for age estimation. The X-ray image of the hand is shown below. What is the likely age of the child?

A. 18 years
B. 7 years
C. 9 years
D. 13 years



74. A research scientist is studying biochemical reactions that take place in the liver. He cultures hepatocytes in a growth media enriched with glutamate labeled with nitrogen isotopes. After some time, he finds that the nitrogen isotopes are transferred to oxaloacetate, forming aspartate in the process. Which of the following substances is most likely involved in this reaction?

A. Biotin
B. Folic acid
C. Niacin
D. Pyridoxine

transaminase

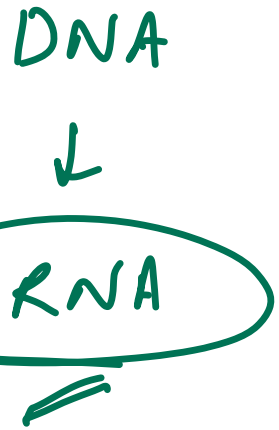
B6

75. A 31-year-old man comes to the OPD for a routine checkup. The patient works as a fitness trainer and lifts weights recreationally. He has been consuming carbohydrate-rich food prior to his weightlifting sessions and claims that it increases muscle strength. A literature review shows that the rate of glycogenolysis within myocytes increases several hundredfold during active skeletal muscle contraction. Which of the following substances is most likely responsible for increasing the reaction rate during active contraction?

A. ATP
B. Ca
C. cAMP
D. Glucose-6-phosphate

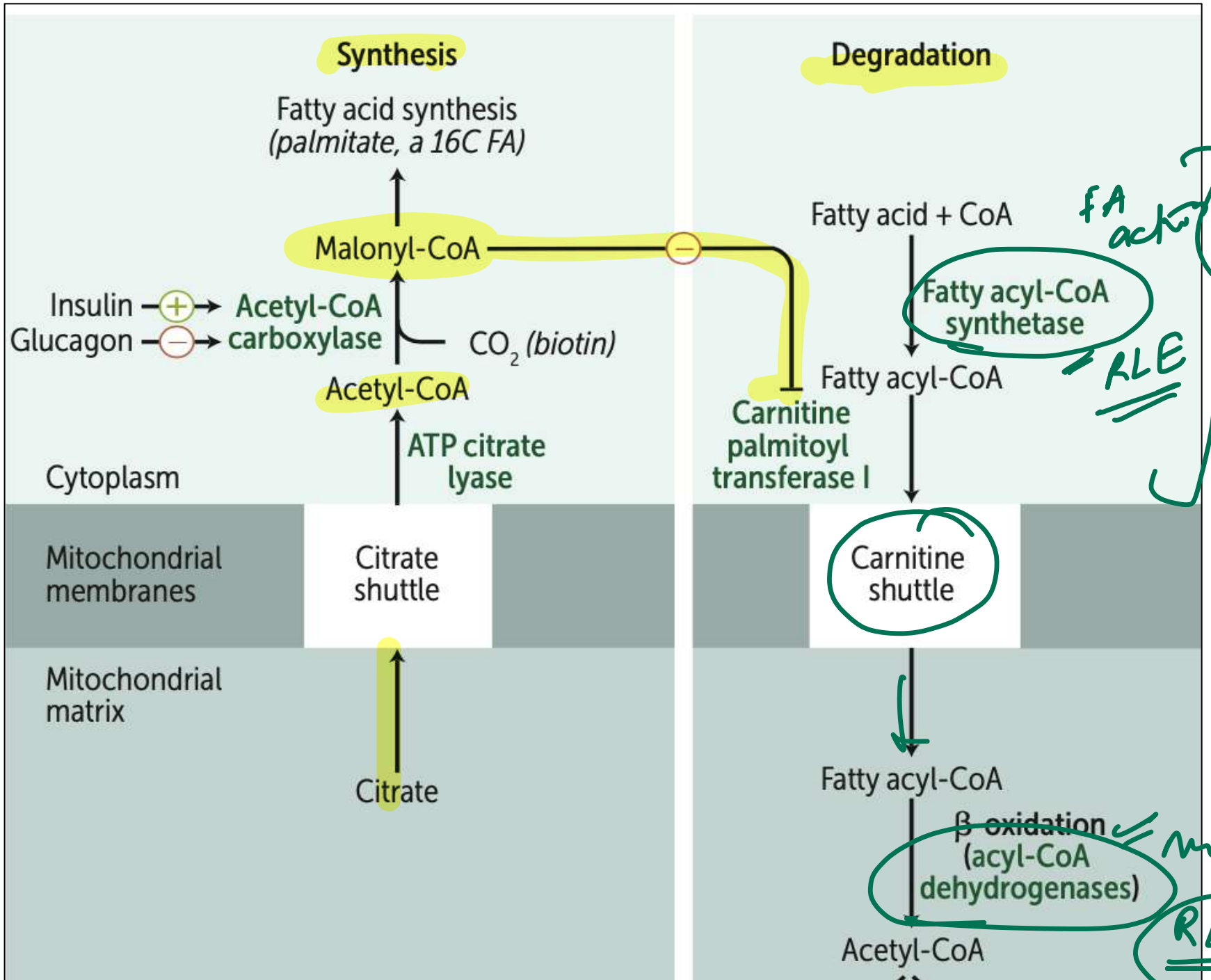
76. A mutation in a non-coding DNA sequence is believed to affect expression of the gene coding for a specific fetal enzyme. Liver and bone marrow cells from the fetus and his parents are obtained. Which of the following is the best method to determine if this gene is being transcribed in cultures of the isolated cells?

A. Northern blot
B. Western blot
C. Southern blot
D. Southwestern blot



77. A research scientist studying the metabolic pathways that contribute to obesity feeds experimental animals a high-carbohydrate, high-protein diet for a prolonged period. A sample of liver tissue is then obtained from the animals, and the activity of various enzymes involved in fatty acid metabolism is measured and recorded. It is determined that beta-oxidation of fatty acids is inhibited within these cells as a result of the diet. An increase in which of the following substances is most likely responsible for the observed effect?

A. Acetoacetate
B. Carnitine
C. Citrate
D. Malonyl-CoA


Synthesis
Degradation
Fatty acid synthesis
(palmitate, a 16C FA)
Malonyl-CoA
Insulin
Glucagon
Acetyl-CoA carboxylase
CO_2 (biotin)
Acetyl-CoA
ATP citrate lyase
Cytoplasm
Mitochondrial membranes
Citrate shuttle
Mitochondrial matrix
Citrate
Fatty acid + CoA
Fatty acyl-CoA synthetase
Fatty acyl-CoA
Carnitine palmitoyl transferase I
Carnitine shuttle
Fatty acyl-CoA
β-oxidation (acyl-CoA dehydrogenases)
Acetyl-CoA
FA activ
RLE
mitoch
RLE

78. Match the following:

A. Nucleotide excision repair	1. Xeroderma pigmentosa
B. NHEJ repair	2. HNPCC
C. Base excision repair	3. SCID
D. Mismatch repair	4. MUTYH polyposis

A. A-1, B-3, C-4, D-2

B. A-3, B-1, C-4, D-2

C. A-1, B-3, C-2, D-4

D. A-1, B-2, C-3, D-4

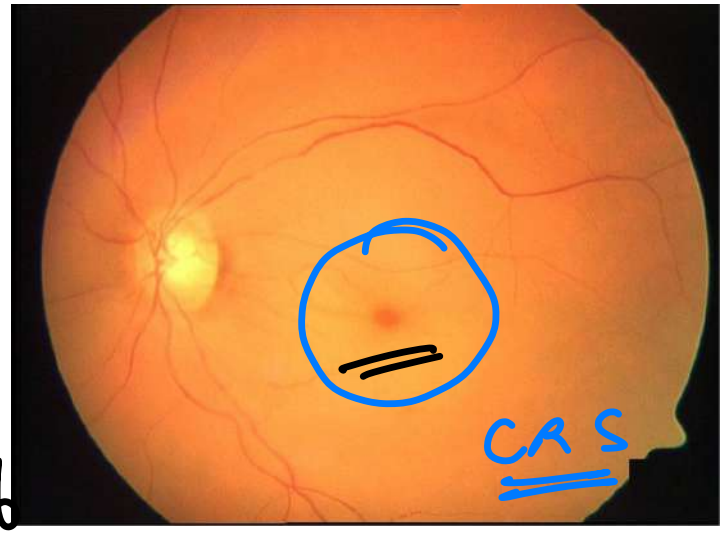
79. Which among the following has low glycemic index?

A. Sweet corn
B. Watermelon
C. Papaya
D. Potato

80. A 8-month-old girl is brought to the OPD for evaluation of iritability and regression of motor skills. Her parents have also noticed that she startles easily with loud noises. Head circumference measurement is consistent with macrocephaly. Bilateral funduscopic evaluation is shown. Which of the following metabolites is most likely present in this patient's tissues?

A. Galactocerebroside
B. Glucocerebroside
C. Sphingomyelin
D. GM2 ganglioside

CATS
Canavan
Alexander
Tay sach
Sandhoff



81. An 8-year-old boy is brought to the emergency department due to vomiting and lethargy. The patient had been on an overnight hiking trip with his family. During the trip, the family lost their food pack while canoeing and had to hike back to their car. The child became weak and was carried for the last mile. None of the family has eaten for approximately 24 hours. On examination, the patient appears listless. Mild hepatomegaly is noted.
Laboratory results are as follows:
Glucose: 22 mg/dL
Acetoacetate: not detected
The patient begins seizing shortly after arriving at the emergency department. Which of the following enzymes is most likely deficient in this patient?

A. Acetyl-CoA carboxylase
B. Acid alpha-glucosidase
C. Acyl-CoA dehydrogenase
D. Glucose 6-phosphatase

82. Which of the following minerals are required in amounts >100mg per day?

A. Copper
B. Calcium
C. Chromium
D. Iodine

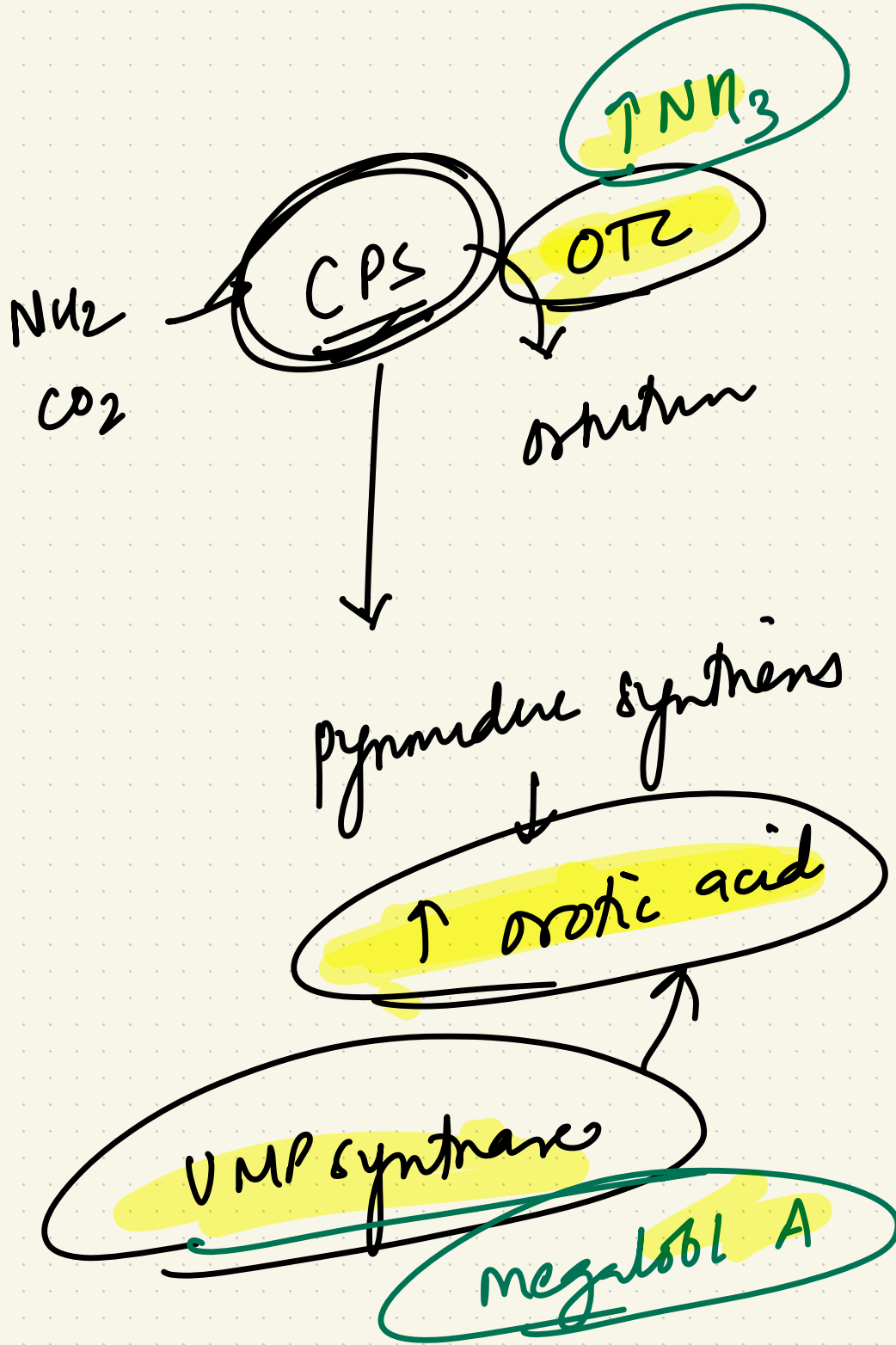
Major elements or Macro-minerals	Trace elements or Micro-minerals
> 100 mg/day • Ca, P • Na, K, Cl • Mg, S	< 100 mg/day • Fe, Fl • Cu, Co, Cr • Mn, Mo • Zn, I, Se

83. You are conducting an experiment on mitochondrial respiration. You add malate/ pyruvate and respiration is normal. You add succinate and respiration is normal. When you add another substance in the presence of pyruvate/succinate and malate, respiration is blocked. Which of the following substances is most likely added?

A. Rotenone
B. Antimycin A
C. Oligomycin
D. 2,4-dinitrophenol

84. A 2-year-old boy is brought to the emergency department with fever, vomiting and sleepiness. He had several episodes of emesis this morning and his mother was unable to wake him from his afternoon nap. Since the newborn period, the parents say that the patient has had multiple illnesses characterized by vomiting and sleepiness. Prior laboratory testing revealed increased blood ammonia levels during these episodes and markedly increased orotic acid excretion in the urine. Physical examination shows a tachypneic boy who is unresponsive to all stimuli. Which of the following enzymes is most likely to be deficient in this patient?

A. Carbamoyl phosphate synthetase I
B. ~~N-acetylglutamate~~ synthetase
C. Ornithine transcarbamylase
D. Uridine monophosphate synthetase


↑ NH3
CPS
OTC
NH2
CO2
orotic
pyrimidine synthesis
↑ orotic acid
UMP synthase
megablol A

85. A patient presented with symptoms of peripheral neuropathy and macrocytic anemia. She was given folate 5mg and the blood picture improved. However, the neurologic manifestations were aggravated. What is the most likely cause?

A. Malabsorption of folate
B. Treatment with folate unmasking pyridoxine deficiency
C. Deficiency of folate reductase in CNS
D. Folate therapy using the B12 stores

B 12

86. A 36-year-old man comes to the OPD due to skin lesions on his palms. The patient has yellowish skin nodules over the palmar creases that have been increasing in size and number over the past several years. He also has small clusters of yellow papules on his elbows, knees, and buttocks. His father died of a myocardial infarction at age 56. Biopsy of his lesions shows accumulation of lipid-laden macrophages. Immunoblot analysis suggests a lack of ApoE3 and ApoE4 in his circulating lipoproteins. Which of the following is most likely Impaired in this patient?

A. ApoC-2 production

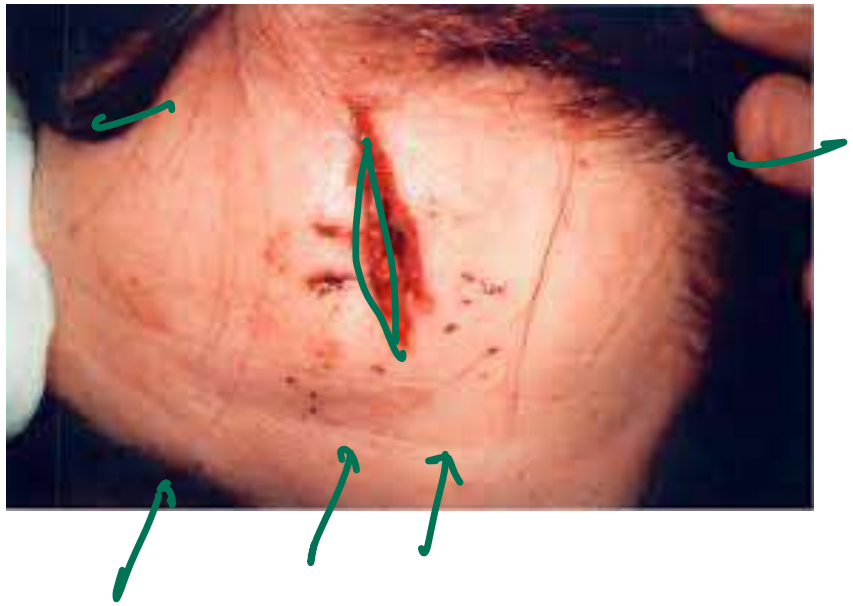
B. Cholesterol esterification in the blood

C. Chylomicron remnant uptake by liver cells

D. LDL particle uptake by hepatocytes

87. Identify the type of injury from the picture given below:

A. Laceration
B. Incised wound
C. Laceration looking incised wound
D. Incised looking laceration



88. A 31-year-old previously healthy man comes to the OPD due to myalgias, anorexia, and skin rash. The patient works as a personal trainer and is a bodybuilding enthusiast. He denies using anabolic steroids but has been consuming large amounts of raw egg whites for the past several months. Physical examination shows macular dermatitis of the extremities. A water-soluble vitamin deficiency is suspected as the cause of his condition. Which of the following biochemical conversions most likely uses the deficient vitamin as a cofactor?

A. Glucose to ribose-5-phosphate
B. Pyruvate to acetyl-CoA
C. Pyruvate to alanine
D. Pyruvate to oxaloacetate

Cofactor for carboxylation enzymes-

- **Pyruvate (3C) → Oxaloacetate (4C)**
- **Acetyl-CoA (2C) → Malonyl-CoA (3G)**
- **Propionyl-CoA (3C)→ Methylmalonyl-CoA (4C)**

BIOTIN
(B7)

89. A researcher placed two functional mRNA sequences that contain trinucleotide repeats of CUC and CUU into a solution containing functional ribosomes and tRNAs that have the appropriate amino acids. After a few hours, it was observed that both mRNA sequences resulted in the production of polypeptide chains with repeated leucine amino acids. Which genetic principle can explain the observed outcome in this experiment?

A. Ambiguity
B. Degenerate
C. Universality
D. Overlapping

Wobble

90. Identify the correct statement with regards to the changes around an entry wound:

1. **Grease collar - due to the deposition of the lubricant of the bullet in the tissues**
2. **Burn injuries - occur due to flame released during the firing**
3. **Blackening – due to deposit of smoke**
4. **Tattooing - Due to unburned grains of gunpowder**

A. 1, 2, 3, 4

B. 1, 3, 4

C. 2, 3

D. 2, 4

91. Which of the following statements is incorrect about isoenzymes?

LDH 1, 2, 3

A. Isoenzymes catalyse the same reaction and are physically distinct forms of enzyme
B. Isoenzymes have different kinetics (km and Vmax)
C. Isoenzymes have Different 1° and 4° structures
D. All of the above statements are correct

92. Although Apo B 48 and Apo B 100 are derived from the same gene but are finally translated into separate proteins. This is mainly due to?

A. DNA gene mutation in intestines
B. RNA interference
C. Alternate splicing
D. RNA editing

93. A 12-year-old boy is brought to the OPD due to gait instability and pruritic skin rash for the past several weeks. His mother reports that he has also been irritable and had loose stools during this time. The patient's childhood development has been unremarkable except for several episodes of similar skin rash that resolved spontaneously. Examination is shown below. Laboratory evaluation shows increased levels of neutral amino acids in the urine. This patient's symptoms would most likely respond to which of the following supplements?

Carcinoid Sx maize

A. Ascorbate
B. Niacin
C. Pyridoxine
D. Riboflavin

Pellagra

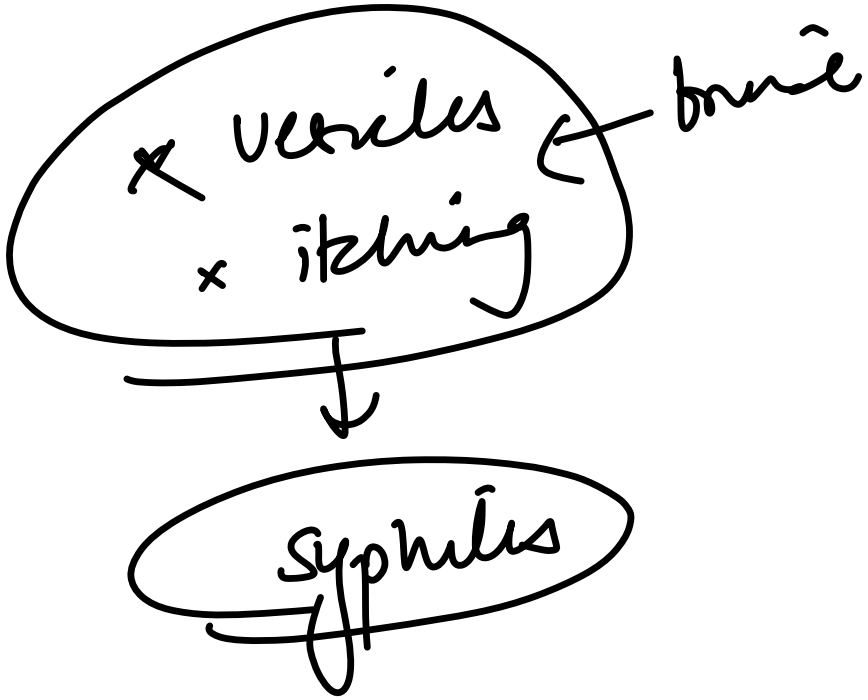
. dermatitis
. diarrhea
. dementia

B6

ATT (INH)

94. What is the active principle of the poison shown in the image?

A. Ricin
B. Bhilawanol
C. Abrin
D. Calotropin



95. Which vitamin, when infused in supraphysiological doses, causes macular edema and macular cysts?

A. Vitamin A
B. Vitamin D
C. Vitamin E
D. Vitamin B3

96. A 46-year-old man comes to the emergency department due to recurrent nosebleeds When interviewed for additional history, he becomes belligerent and uncooperative. The patient has a history of alcohol abuse and chronic mental illness. He has been placed in homeless shelters on multiple occasions but has not remained there for any prolonged periods. Physical examination shows swollen gums, scattered ecchymoses, and hyperkeratosis. He also has a chronic ulcer on the left lower extremity that does not appear to be infected. Which of the following mechanisms accounts for this patient's examination findings?

A. Abnormal oxidative decarboxylation of ketoacids
B. Abnormal proline hydroxylation
C. Abnormal transamination
D. Deficient methionine synthesis

97. A 35-year-old female who completed her family attended the gynaecology OPD with complaints of dysmenorrhoea, dyspareunia, painful defecation and urination. Sometimes she complained of pelvic pain before the start of menstruation. The doctor made a diagnosis of endometriosis and planned for a vaginal hysterectomy. During the surgery, the surgeon injured the ureter even after discharging his duty with care during the operation. The patient now filed a medical negligence case in court. According to which of the following doctrines is the doctor not negligent in the above-said case?

A. Doctrine of res ipsa loquitur
B. Doctrine of common knowledge
C. Calculated risk doctrine
D. Doctrine of contributory negligence

post to uterine A

Medical malocclusion

98. Identify the true statement about the image given below?

A. Seen within 24 hours of death > 48-72 hrs

B. Due to sulph-meth-hemoglobin accumulation and formation

C. Due to aseptic nonbacterial cause

D. It is associated with a case of electrical burns

Sulf meth Hb / Sulf Hb

99. Which of the following is true about Rigor Mortis?

A. It involves only a group of voluntary muscles ✓

B. It is dependent on nervous innervation ✗✗

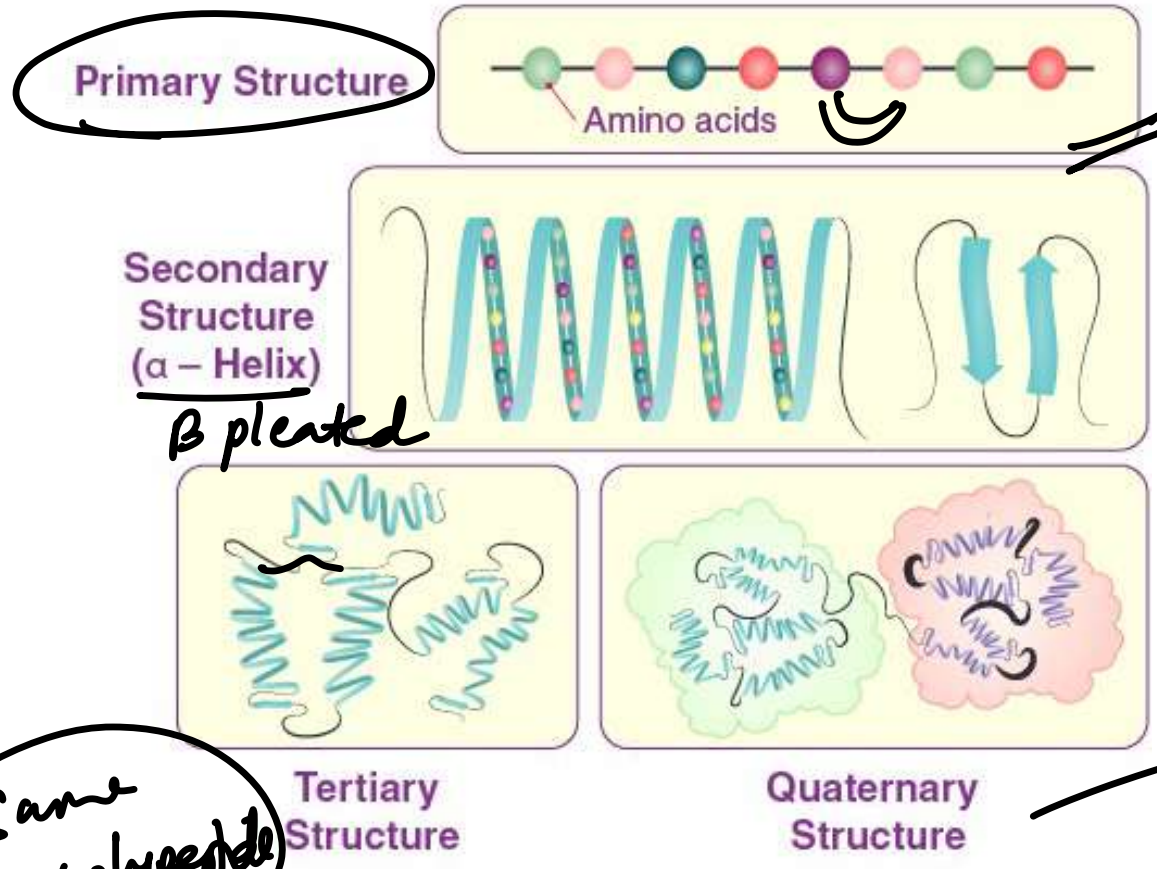
C. It does not occur in a fetus <7 months old ✓

D. Muscle protein coagulation is the underlying mechanism ✗

↳ pyrexia - heat stiffening ✓

100. Which of the following is true about the structural organization of proteins?

A. Tertiary structure is three dimensional
B. Primary, secondary and tertiary structures are destroyed by denaturation
C. Secondary structure is stabilized by disulphide bonds
D. Secondary and Tertiary structure depends upon amino acid sequence



+ disulfide bonds

steric rel^n

H bonds

B pleated

– 2 diff polypeptide

Same polypeptide

non covalents

Hydrophobic

electrostatic

van der Wall

Thank You!