Odai Al-refai

Protein & Amino acid Metabolism :

- *Protein degradation by proteasome can be described as follows*
- *A. Uses receptor mediated endocytosis to enter proteins into the proteasomal core*
- *B. Uses a single ubiquitin molecule to tag a protein for degradation*
- *C. Degrades extracellular and membrane proteins*
- *D. Needs the globular ubiquitin enzyme that degrades proteins*
- *E. Requires energy for ubiquitination*

- *A*nswer*: E*

- *The main acceptor of NH3 in transamination reactions*
- *A. Glutamate*
- *B. a-ketoglutarate*
- *C. Glutamine*
- *D. Alanine*
- *E. Serine*
- Answer: B

- *The only AA that will not enter krebs cycle as Succinyl CoA*
- *A. Methionine*
- *B. Histidine*
- *C. Threonine*
- *D. Valine*
- *E. Isoleucine*

- *Answer*: B

- *Which one of the following statements concerning amino acids is Correct*
- *A. An increase in gluconeogenesis from amino acids results in a decrease in urea formation*
- *B. All essential amino acids are glucogenic*
- *C. Ornithine and citrulline are found in tissue proteins*
- *D. Cysteine is an essential amino acid in individuals consuming a diet severely limited in methionine*

- *Answer: D*

- *A defective glucorodyl transferase is associated with all of the following except*
- *A. gilbert syndrome*
- *B. criggler najjjar*
- *C. liver cirrhosis*
- *D. dubin Johnson syndrome*

- *Answer: D*

- *Which substrate is common for purines, heme and creatine synthesis*
- *A. Glycine*
- *B. Succinate*
- *C. Arginine*
- *D. Aspartate*
- *E. Alpha-ketoglutarate*

- *Answer: A*

- *Which of the following regarding protein digestion is true*
- *A. High pH value in the stomach helps in hydrolysis of some proteins*
- *B. Pepsin can only be activated through autocatalytic activation*
- *C. Free amino acids are the only form that is taken up by intestinal cells*
- *D. Trypsin is the common activator of all pancreatic zymogens*
- *E. Trypsin can only be activated through autocatalytic activation*

- *Answer: D*

- *The two nitrogen atoms in urea are derived directly from*
- *A. Aspartate and Ammonia*
- *B. Asparagine and Glutamine*
- *C. Glycine and Glutamine*
- *D. Glutamine and Ammonia*
- *E. Glutamate and Glutamine*

- *Answer: A*

- *Proteolytic enzymes must be secreted as zymogens that are activated, otherwise they would auto-digest themselves and the organs that produce them.Trypsinogen, a zymogen, is cleaved to form trypsin by a protease that is secreted by which of one the following*
- *A. Colon*
- *B. Liver*
- *C. Pancreas*
- *D. Stomach*
- *E. Small intestine*

- *Answer: E*

- *When comparing infant I (low blood arginine; high blood ammonia) to infant II (high blood arginine; moderately high blood ammonia), infant II might have a problem in…*
- *A. CPS I*
- *B. Arginase*
- *C. Argininosuccinate lyase*
- *D. Argininosuccinate synthase*
- *E. OTC*

- *Answer: B*

- *How many ATP equivalents are required to produce one molecule of urea from ammonia and aspartate*
- *A. 2*
- *B. 4*
- *C. 1*
- *D. 3*
- *E. 6*

- *Answer: B*

- *If an individual has a vitamin B6 deficiency, which one of the following amino acids could still be synthesized and be considered non essential*
- *A. Cysteine*
- *B. Serine*
- *C. Aspartate*
- *D. Alanine*
- *E. Tyrosine*

- *Answer: E*

- *Which of the following statements describes the ubiquitin mediated degradation of proteins in the cytosol*
- *A. After degradation of the protein, ubiquitins are transferred extracellularly for excretion*
- *B. The process is ATP-dependent*
- *C. The degradation results in free amino acids released into the cytosol*
- *D. This pathway is more specific to extracellular proteins*
- *E. One molecule of ubiquitin is attached to the protein to be degraded*

- *Answer: B*

- *Regarding heme synthesis in the liver, all statements are correct EXCEPT*
- *A. Uroporphyrinogen III is synthesized from porphobilinogen*
- *B. ALA synthase requires pyridoxal phosphate and located in mitochondria*
- *C. ALA synthase can be induced by many drugs*
- *D. Synthetic pathway involves carboxylation reactions at more than one step*
- *E. ALA synthase is suppressed by hemin*

- *Answer: D*

- *Melatonin is made of the following Amino acid*
- *A. Tyr*
- *B. Phe*
- *C. Arg*
- *D. Thr*
- *E. Trp*

- *Answer: E*

- *Newborns jaundice can be described as follows*
- *A. Liver cells function is abnormal*
- *B. Glucuronyl transferase levels are lower than in a normal newborn*
- *C. Conjugated bilirubin levels are higher than albumin capacity to bind toxicity*
- *D. Newborn exposure to blue fluorescent light produces water-insoluble photoisomers*
- *E. Conjugated bilirubin levels are high in these infants*

- *Answer: B*

- *Gilbert syndrome is caused by a deficiency of the following enzyme*
- *A. Tyrosine hydroxylase*
- *B. Heme oxygenase*
- *C. bilirubin glucuronyl-transferase*
- *D. Biliverdin reductase*
- *E. ALA synthase*

- *Answer: C*

- *Which of the following is not synthesized by tyrosine*
- *A. Melatonin*
- *B. Dopamine*
- *C. Melanin*
- *D. Epinephrine*
- *E. All answers are Correct*

- *Answer: A*

- *A 1-week-old infant, who was born at home in a rural, medically-underserved area, has undetected classic phenylketonuria.Which statement about this baby and/or her treatment is Correct*
- *A. A diet devoid of phenylalanine should be initiated immediately*
- *B. Phenylpyruvate is found in the urine*
- *C. Supplementation with vitamin B6 is required*
- *D. Tyrosine is a nonessential amino acid*

- *Answer: B*

- *Which of the following enzymes is inhibited by Lead*
- *A. ALA dehydratase*
- *B. Ferroxidase*
- *C. ALA synthase*
- *D. Biliverdin reductase*
- *E. Tyrosine hydroxylase*

- *Answer: A*

- *A female neonate did well until approximately 24 hours of age when she became lethargic. A sepsis workup proved negative. At 56 hours, she started showing focal seizure activity. The plasma ammonia level was found to be 1,100 umol/L (normal 5- 35 umol/L). Quantitative plasma amino acid levels revealed a marked elevation ofargininosuccinate. Which one of the following would also be elevated in the blood of this patient*
- *A. Asparagine*
- *B. Glutamine*
- *C. Lysine*
- *D. Urea*
- *E. None of the above*

- *Answer: B*

- *Which of the following describes heme synthesis*
- *A. Fe+2 addition is the rate limiting step that requires ATP hydrolysis as an energy source*
- *B. Two molecules of porphobilinogen are combined in a tetrapyrrole ring*
- *C. Fe+2 is added by the cvtosolic ferrochelatase enzyme*
- *D. Four ALA molecules are combined to produce porphobilinogen*
- *E. Gly and succinyl-CoA are precursors for heme synthesis*

- *Answer: E*

- *Regarding urea cycle, which of the following statements is NOT CORRECT*
- *A. Urea nitrogen atoms are derived indirectly from glutamate*
- *B. Urea cycle enzymes are induced by high protein diet or starvation*
- *C. Urea formation takes place in liver only*
- *D. N-acetyl glutamate is an activator of urea cycle*
- *E. Urea cycle just like CA cycle takes place completely in the mitochondria*

- *Answer: E*

- *Which of the following amino acids match with the corresponding catabolic product*
- *A. (glutamate, glutamine, alanine ,arginine) > pyruvate*
- *B. (histidine, glutamate, arginine, proline)>alpha ketoglutarate*
- *C. (isoleucine, valine , tryptophan) > succinyl CoA*
- *D. (aspartate, phenylalanine, tyrosine) > OAA*
- *E. Nothing are Correct*

- *Answer: B*

- *The molecule which is attached to other molecules to make them more polar is*
- *A. Glucose*
- *B. Glucoronate*
- *C. Bilirubin*
- *D. Gluconic acid*
- *E. Fructose*

- *Answer: B*

- *Gilbert' syndrome*
- *Answer: Deficiency in bilirubin diglucuronosyltransferase*

- *Carabomoyl phosphate synthetase synthesized in hepatic cytosol is used*
- *A. Pyrimidine synthesis*
- *B. Urea cycle activator*
- *C. Purine synthesis*
- *D. Activator of IMP formation*
- *E. folic acid synthesis*

- *Answer: A*

- *A Coenzyme derived from Vitamin B12 is needed for*
- *A. Synthesis of D-Methylmalonyl CoA*
- *B. Formation of Guanidinoacetate*
- *C. Decarboxylation of Uroporphyrinogen III*
- *D. Proprionyl CoA metabolism*

- *Answer: D*

- *Which of amino acid the following compounds is CORRECTLY matched with the precursor*
- *A. 5 Histamine, tyrosine*
- *B. Creatine, lysine*
- *C. Epinephrine, aspartate*
- *D. Serotonin, tryptophan*
- *E. Melanin, tryptophan*

- *Answer: D*

- *Bilirubin is transported to hepatocytes via(Important)*
- *A. Facilitated diffusion*
- *B. Conjugation to nucleotidesion*
- *C. Na+/K+ pump*
- *D. Active transport*
- *E. Proton pump*
- *Answer: A*

- *Transport of conjugated bilirubin through bile by*
- *Answer: active transport*

- *Bilirubin bind to albumin through*
- *Answer: Non covalent binding*

- *Creatine…*
- *Answer: Can be given as a supplement*

- *Histidine > Histamine. Reaction type*
- *Answer: Decarboxylation*

- *Liver function test...Which enzyme is sensitive? AST*
- *Which is specific? ALT*

- *Which of the following enzymes can fix free ammonia into a chemical molecule*
- *A. Glutamate dehydrogenase*
- *B. SAH hydrolase*
- *C. Glutaminase*
- *D. Serine hydroxymethyl transferase*
- *E. None of the above*

- *Answer: A*

- *A patient who has a glutamine synthetase deficiency would have all of the following EXCEPT*
- *A. Glutamate amination to glutamine is compromised*
- *B. Transport of ammonia from most tissues to liver is hindered*
- *C. Toxic levels of ammonia may accumulate in the patient's tissues and/or blood*
- *D. Transport of ammonia from muscle cells to the liver is not affected*
- *E. Transamination of α–ketoglutarate to glutamate is downregulated*

- *Answer: E*

- *All of the following shared between Krebs cycle and Urea cycle EXCEPT*
- *A. CO2*
- *B. Fumarate*
- *C. ATP*
- *D. Acetyl CoA*
- *E. Aspartate*

- *Answer: C*

- *One of the following amino acids is essential and glucogenic*
- *A. Glutamine*
- *B. Tyrosine*
- *C. Threonine*
- *D. Serine*
- *E. Phenylalanine*

- *Answer: C*

- *Sulfur group in cysteine comes from*
- *A. Serine*
- *B. Homocysteine*
- *C. SAM*
- *D. Alpha-KB*
- *E. None of the above*

- *Answer: B*

- *Symptoms of People who have phenylketonuria*
- *A. Hypophenylalanine*
- *B. Increase concentration of phenylalanine*
- *C. Not effect of IQ*

- *Answer: B*

- *What is the cause of complete inhibition of heme synthesis*
- *A. ALA dehydrates deficiency*
- *B. Congenital erythropoietic porphyria*
- *C. Erythropoietic protoporphyria*
- *D. Uroporphyrinogen III decarboxylase deficiency*

- *Answer: D*

- *In what types of jaundice urobilinogen is absent*
- *A. Obstructions*
- *B. Hemolytic*
- *C. Hepatic*
- *D. Hepatocellular*
- *E. Prehepatic*

- *Answer: A*

- *One of the following is TRUE considering nitrogen containing compounds*
- *A. Sources of carbon atoms in creatine structure are: glycine, arginine, and SAH*
- *B. Tyrosine hydroxylase catalyzes the rate limiting step in catecholamine synthesis*
- *C. In hepatocellular jaundice; stool may be pale and urinary urobilinogen is absent*
- *D. Conjugated bilirubin is oxidized to urobilinogen then gets reduced to urobilin in the kidneys*
- *E. Conjugated bilirubin is oxidized to urobilinogen then gets reduced to stercobilin by intestinal flora*

- *Answer: B*

- *OTC deficiency and UMP synthase deficiency can result in one of the following conditions*
- *A. Orotic aciduria*
- *B. Megaloblastic anemia*
- *C. Hyperphenylalaninemia*
- *D. Hyperammonemia*
- *E. Albinism*

- *Answer: A*

- *Albumin binds all of the following EXCEPT*
- *A. Free fatty acids*
- *B. Steroid hormones*
- *C. Conjugated billirubin*
- *D. Calcium+2*

- *Answer: C*

- *In alkaptonuria patient, the metabolism of accumulation of…… is stopped thus causing accumulation of …..*
- *Answer: Tyrosine, Homogenestic acid*

- *Which of the following is a glucogenic amino acid that produces pyruvate and succinyl CoA upon degradation*
- *Answer: Threonine*

- *The rate limiting step in heme synthesis*
- *Answer: Uses glycine as a substrate*

- *S-adenosylmethionine is used for the synthesis of*
- *Answer: Creatine*

- *Catecholamines are degraded by*
- *Answer: MA0 and COMT*

- *What is true about homocystinuria*
- *Answer: treatment restriction of methionine & supplementation of Vit B12, B6 & folate*

- *What is the wrong sentence about creatine syntheses*
- *Answer: it’s an irreversible reaction*

- *Transport of ammonia*
- *Answer: alanine and glutamine*

- *Where is the heme production process which considered in a relatively constant rate*
- *Answer: erythrocyte producing cells of bone marrow*

- *What is the correct sentence about protein digesting*
- *Answer: chymotrypsin cut the aromatic amino acid in the C terminal*

- *Which of these reactions is reversible*
- *Answer: oxidative deamination*

Nucleotides Metabolism :

- *Folic acid derivatives are needed for the following pathway*
- *A. UMP de novo synthesis.*
- *B. Cysteine production from methionine*
- *C. Purine de novo synthesis*
- *D. Asparagine synthesis*
- *E. Purine salvage pathway*

- *Answer: C*

- *dUTP is prevented from being incorporated into DNA structure during DNA replication by the action of*
- *a. APRT*
- *b. Thymidylate synthase*
- *C. PRPP synthetase*
- *d. HGPRT*
- *e. dUTPase*

- *Answer: E*

- *The carbamoyl phosphate that is being synthesized in the cytosol of a hepatocyte would be used to*
- *A. De novo synthesize purine nucleotides*
- *B. Increase amino acid degradation after a protein rich meal*
- *C. Activate urea cycle*
- *D. De novo synthesize pyrimidine nucleotides*
- *E. Increase purine degradation and production of uric acid*
-
- *Answer: D*

- *Dihydrofolate reductase is targeted by the following pharmacological inhibitor*
- *A. Allopurinol*
- *B. Probenecid*
- *C. Methotrexate*
- *D. Hydroxyurea*
- *E. 5-fluorouracil*

- *Answer: C*

- *Fumarate is formed as a by-product from which of the following pathways*
- *A. Folic acid metabolism*
- *B. Formation of Arginino succinate*
- *C. Formation of GMP from IMP*
- *D. Formation of AMP from IMP*
- *E. None of the above*
- *Answer: D*

- *Which one of the following enzymes of nucleotide metabolism is correctly paired with its pharmacologic inhibitor*
- *A. Thymidylate synthase-allopurinol*
- *B. Ribonucleotide reductase-5-fluorouracil*
- *C. Inosine monophosphate dehydrogenase-hydroxyurea*
- *D. Dihydrofolate reductase-methotrexate*
- *E. Xanthine oxidase-probenecid*

- *Answer: D*

- *A 42-year-old male patient undergoing radiation therapy for prostate cancer develops severe pain in the metatarsal phalangeal joint of his right big toe. Monosodium rate crystals are detected by polarized light microscopy in fluid obtained from this joint by arthrocentesis. This patient's pain is directly caused by the overproduction of the end product of which of the following metabolic pathways*
- *A. De novo pyrimidine biosynthesis*
- *B. Pyrimidine degradation*
- *C. De novo purine biosynthesis*
- *D. Purine degradation*

- *Answer: D*

- *Which of the following prevents the incorporation of dUTP into the DNA during DNA synthesis*
- *A. dUTPase*
- *B. Thymidylate kinase*
- *C. Guanase*
- *D. Nucleotidase*

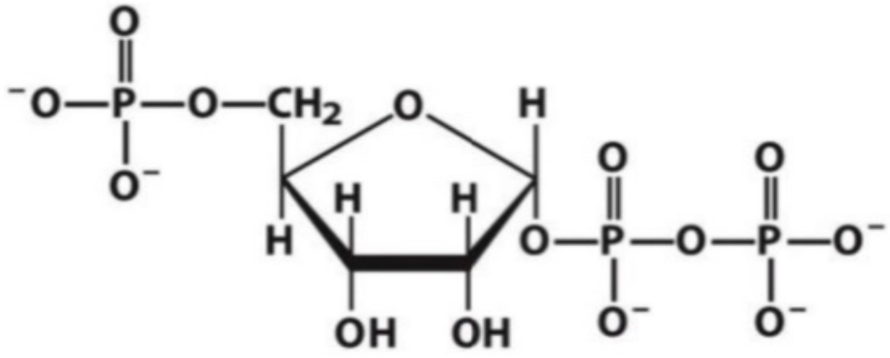
- *Answer: A*

- *What contribute to the DE NOVO synthesis of pyrimidine*
- *A. Fumarate*
- *B. Glycine*
- *C. Co2*
- *D. B And C*
- *E. THF*
- *Answer: D*

- *Degradation of purine produces*
- *Answer: Ammonia and uric acid*

- *During transferring IMP into AMP in nucleic acid metabolism, which of the followings is not true*
- *Answer: The formation of AMP doesn't need ATP (energy)*

- *The following structure represents*
- *A. Ribose 5 phosphate*
- *B. AMP*
- *C. PRPP*
- *D. GMP*
- *E. None of the above*



- *Answer: C(maybe not required)*

- *Protoporhyrin IX is: I. Intermediate in heme synthesis II. Intermediate in heme degradation*

- *A. I only*
- *B. II only*
- *C. Both I and II*
- *D. Neither I nor II*
- *Answer: A*

- *The final product of purine degradation is -------- while the final product of pyrimidine degradation is----------*
- *A. Uric acid, beta alanine*
- *B. Urea, uric acid*
- *C. Uric acid, hypoxanthine*
- *D. Ammonia, xanthine*
- *E. PRPP, carbamoyl phosphate*
- *Answer: A*

- *Regarding purine & pyrimidine synthesis…*
- *Answer: Purine synthesis starts with formation of PRPP. Pyrimidine synthesis includes formation of PPP near the end of the pathway*

- *Which of the following is NOT a precursor for DE NOVO purine biosynthesis*
- *A. N-formyl-terahydrofolate*
- *B. Aspartic Acid*
- *C. Glycine*
- *D. Arginine*
- *E. Glutamine*

- *Answer: D (important)*

- *IMP in converted to GMP by the transfer of amine group from*
- *A. glutamine*
- *B. glutamate*
- *C. aspartate*
- *D. alanine*
- *E. None of the above*

- *Answer: A*

- *True about the enzyme that produces deoxyribonucleotid (RR)*
- *A. ATP is a competitive inhibitor*
- *B. inhibited by hydroxyurea*
- *C. dATP is a competitive activator*

- *Answer: B*

- *wrong about xanthine oxidase*
- *Answer: H2O2 is the substrate*

- *Orotic aciduria results when*
- *Answer: The last two enzymes Orotate phosphoribosyl transferase and OMP decarboxylase are defect*

Vitamins & obesity :

- *The active Form of VITAMIN D is*
- *A. Ergocalciferol*
- *B. 7-dehydrocholesterol*
- *C. 1,25-digydroxycholecalciferol*
- *D. cholecalciferol*
- *E. 25-hydroxycholecalciferol*

- *Answer: C*

- *Fragility of RBCs caused by Deficiency Of*
- *A. Vitamin A*
- *B. Vitamin B*
- *C. Vitamin C*
- *D. Vitamin D*
- *E. Vitamin E*

- *Answer: E*

- *A Coenzyme produced from vitamin B12 is required in*
- *A. In production of phosphatidyl choline from phosphatidyl ethanolamine*
- *B. Carboxylation of propionyl COA to methylmalonyl COA*
- *C. The metabolism of propionyl COA produced from fatty acids with odd number of carbon atoms.*
- *D. In using ketone bodies as a source of energy in the muscle*
- *E. In production of succinyl COA from succinate in the muscle*
- *Answer: C*

- *Vitamin D can be produced by exposure of UV light in Form of*
- *A. farnesyl pyrophosphate*
- *B. lanosterol*
- *C. 7-dehydrocholesterol*
- *D. none of the above*
- *E. squalene 2,3 epoxide*

- *Answer: C*

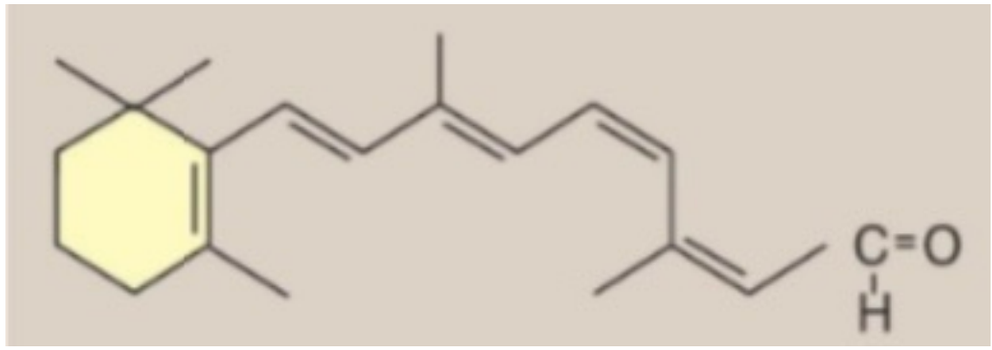
- *A 50-year-old man, 170 cm tall and weighing 90 kg, seeks your advice on how to lose weight. His waist measured 110 cm and his hips 100 cm. His only child, his siblings, and both of his parents are overweight. The patient recalls being obese throughout his childhood and adolescence. Over the past 15 years he tried several weight reduction diets. On discontinuation of each diet, he regained weight. Which one of the following best describes this patient*
- *A. He mostly has a larger number of fat cells when compared to a normal-weight individual*
- *B. He is classified as overweight*
- *C. He would be expected to show lower than normal levels of circulating leptin*
- *D. He would be expected to show higher than normal levels of circulating HDL*
- *E. He shows a "pear" pattern of fat distribution*
- *Answer: A*

- *Loss of weight can be achieved by Inhibition of*
- *a. phosphatidyl serine decarboxvlase*
- *b. pancreatic lipase*
- *c. HMG COA lyase*
- *d. lipoprotein lipase*
- *e. acyl COA dehvdrogenase*

- *Answer:B*

- *The vitamin that the human body can make*
- *Answer: Cholecalciferol*

- *True about the structure in the photo:*
- *Answer: It has high affinity for opsin*



- *14-40-year-old woman, 5 feet, 1 inch (155 cm) tall and weighing 188 pounds (85.5kg), seeks your advice on how to lose weight. Her waist measured 41 inches and her hips 39 inches. A physical examination and blood laboratory data were all within the normal range. Her only child, who is 14 years old, her sister, and both of her parents are overweight. The patient recalls being obese throughout her childhood and adolescence. Over the past 15 years she had been on seven different diets for periods of 2 weeks to 3 months, losing from 5-25 pounds. On discontinuation of each diet, she regained weight, returning to 185-190 pounds. Which one of the following best describes this patient*
- *A. She is classified as overweight*
- *B. She shows an "apple"" pattern of fat distribution*
- *C. She has approximately the same number of fat cells as a normal-weight individual, but each adipocyte is larger*
- *D. She would be expected to show lower than normal levels of circulating leptin*
- *Answer: B*

The End