**PROJECT QUESTIONS**

**COURSE1 Neurobiology**

**Q1. What are the two molecules which intervene in the construction of RNA and**

**DNA.**

1. ATP and cytosolic
2. Pyrimidines and ATP
3. GTP and ATP
4. Pyrimidines and Purines

No one of the above

Q2. **What is the enzyme which is responsible for conversion of glutamate to**

**glutamine and is expressed exclusively in astrocytes (Norenberg and**

**Martinez-Hernandez 1979 ).**

1. Glutaminase
2. glutamine synthetase (GS)
3. Phosphate
4. GlutamateDecarboxylase
5. No one of the above

**Q3. What stimulates glycogenolysis in cultured astrocytes and brain slices**

1. Adenosine
2. Hepatocytes
3. Guanosine
4. Ca 2+
5. No one of the above

**Q4. What are the most abundant excitatory neurotransmitters in the**

**CNS, which act through both metabotropic and ionotropic receptors?.**

1. GABA and AMPA
2. Glutamate and ATP
3. NMDA and ATP
4. GABA and NMDA
5. All are correct

**Q5. What does ATP stands for?**

1. **Adenosine Triphosphate**
2. **Acytosine Triphosphate**
3. **A and B are correct**
4. **Adenosine Tetracycline**
5. **No one from the above9**

**COURSE 2 IMMUNE SYSTEM**

**Q1. What is the first vaccine Louis Pasteur used to vaccinate a group of sheep with heat-attenuated in 1881?.**

1. Bacillus anthracis
2. BCG
3. VAP
4. VAP and Bacillus anthracis
5. All are correct

**Q2. The cells of the acquired immune system are T and**

**B lymphocytes, it is of two types which are:**

1. Lymphocytes and antibodies
2. molecules of the innate system and lymphocytes
3. cells and molecules of the innate system
4. humoral (antibody-mediated system) and cell mediated
5. All are correct

**Q3. Three biochemical pathways that activate the complement**

**System:**

a. the classical complement pathway, the alternate complement

pathway, and the mannose-binding lectin pathway.

b. Complement system, immune clearance and inflammation system.

c. Somatic hypermutation, inflammation system and the mannose-binding lectin pathway.

d. no one is correct

e. all are correct.

**Q4. What is *MHC?***

1. The MHC is a large genetic complex with multiple loci and encodes for three major classes of membrane-bound glycoproteins: class I, class II, and class III MHC molecules.
2. MHC are molecules that have common structural features and roles in antigen processing.
3. MHC are genes that encode various secreted immune system-related proteins, including components of the complement system and molecules involved in inflammation.
4. MHC are genes that encode glycoproteins expressed primarily on antigen presenting cells (macrophages, dendritic cells, and B cells), where they present processed antigenic peptides to Th cells.
5. All are correct.

**Q5. What is meant by immunodeficiency?**

1. Is Cytotoxic drugs or radiation treatments given to cancer patients damage the immune cells and thereby induce a state of immunodeficiency.
2. Are drugs that are used to combat autoimmune diseases such as rheumatoid arthritis or lupus erythematosus induce the abovementioned kind of immunodeficiency
3. Immunodeficiency is a state in which the immune system compromises or is unable to fight infectious disease.
4. All are correct.
5. No one is true.

**COURSE 3. NUTRITION AND HEALTH**

**Q1. There are three macronutrients, which are they?**

1. Vitamins, carbohydrates and glucose.
2. Carbohydrates, vitamins and proteins
3. Protein, fats and vitamins
4. Carbohydrates, fats and proteins
5. no one is correct

**Q2. aWhat are those simple monosaccharides carbohydrates range from?**

1. Glucose, lactose and collagen
2. Glucose, fructose and galactose
3. Lactose,fructose and glucose
4. Collagen, fructose and lactose
5. Each of them are correct**.**

**Q3. What triglyerides consist on?**

1. Fats (triglycerides) consist of fatty acid monomers, some of which are essential, bound to a glycerol backbone. They are classified as saturated or unsaturated, depending on the detailed structure present, specifically the number of double bonds.
2. They consist on saturated fats from animal sources and, for example, coconut have been a staple food for millennia, unsaturated fats (e.g., vegetable oil) are still considered to be healthier, despite recent evidence suggesting saturated fats might not be as detrimental as previously thought.
3. are unsaturated with one or more trans-isomer bond; these are rare in nature and typically created during industrial processing, specifically hydrogenation.
4. A,b and c are correct.
5. No one is correct.

**Q4. What are antinutrients?**

1. are, generally, minerals and vitamins
2. Antinutrients are natural or synthetic compounds that interfere with the absorption of nutrients.
3. are structural molecules as well as enzymes
4. Antinutrients consists on largely of cellulose, which is not digested, but helps maintain gut function by bulking out waste and providing a food source (prebiotics) for gut bacteria (microbiome).
5. No one is correct.

**Q.5. Give an example of antinutrients.**

a. Protease inhibitors (e.g., Bowman–Birk trypsin inhibitor in soybeans (Birk, 1985)), which inhibit trypsin, pepsin, and other proteases in the gut, preventing digestion and absorption of proteins and amino acids.

b. Lipase inhibitors (e.g., tetrahydrobiopterin), which interfere with enzymes, such as lipases, which catalyze hydrolysis of some

lipids and fats.

c. Amylase inhibitors in beans, which prevent the action of enzymes that break the glyosidic bonds of starches and other complex carbohydrates, preventing the release of simple sugars and absorption by the body.

d. a, b and c are correct.

e. no one is true.

COURSE 4. HUMAN HEALPH EFFECT

**Q1. What are the diseases Involving Both Physiologic Disruption and Cell Damage?**

1. Cardiovascular Disease
2. Cancer disease
3. Diabetes
4. Obesity
5. No one of them.

**Q2. What are Steroid hormones?**

a. Steroid hormones are inhibitors in plasma.

b. Steroid hormones are molecules with unlimited solubility in plasma and are accordingly carried through the plasma compartment to target cells by specific plasma transport proteins. Each transport protein has a specific ligand-binding domain for its associated hormone.

c. Steroid hormones are lipid molecules with limited solubility in plasma and are accordingly carried through the plasma compartment to target cells by specific plasma transport proteins. Each transport protein has a specific ligand-binding domain for its associated hormone.

d. Steroid hormones are lipid molecules with limited solubility in plasma and are accordingly carried through the plasma compartment to target cells by specific plasma transport proteins.

e. c and d are correct.

**Q.3. What can produce antiandrogenic effects either by inhibition of testicular androgen secretion via blocking the secretion of luteinizing hormone or by direct suppression**

**of testosterone synthesis by Leydig cells.**

1. Estrogens
2. Progesterons
3. Oestrogens
4. Collagen
5. No one of these are correct

**Q4. Many environmental mixtures contain numerous AhR agonists, what are they ?**

1. PAHs, PCDDs, polychlorinated dibenzofurans, and PCBs.
2. PAHs. THF, and dibenzofurans.
3. 90-kDa HSP, ARNT
4. A and b are correct
5. No one is correct

**Q5. It is well established that the 3-MC type of enzyme induction profile elicited by chlorinated dioxins and dibenzofurans, PAHs, and non-*ortho*-substituted PCBs is mediated by….?**

1. AhR
2. ARNT)
3. HIF
4. B and c are correct
5. No one is correct

COURSE 5 DYNAMICS OF BIOLOGICAL SYSTEM

**Q1. What do you understand by Cellular systems?**

1. Cellular networks are the basis for an understanding of cellular functions and disease mechanisms.
2. Cellular systems are networks of interacting components that change with time in response to external and internal events.
3. Cellular networks are components that change an understanding of cellular functions and disease mechanisms.
4. Cellular systems are networks of interacting of cellular functions
5. All are correct.

**Q2. In Dynamics of biological systems what do you understand by a system?**

1. A system is a set of inter-related and interacting objects
2. A system Is the quantitative complement of all the low-molecular- weight molecules present in cells in a particular.
3. A systems is a theorical analysis that identifies physiological or developmental state cell differentiation as a bistable system and allows, through simulations, an optimized design of experiments.
4. A and b are correct.
5. No one is correct

**Q3. In biology, systems appear on all levels of organization, which ones:**

1. Cellular, organ, individual and fiber
2. Subcellular, fiber and muscles
3. Subcellular, cellular, tissue, organ, individual and population.
4. Population, cellular, fiber and muscles.
5. All are correct

**Q4. What is an important part of systems biology?**

a. Data acquisition

b. data integration.

c. Kinetic modeling

d. data manipulation

**Q5. What causes cancer to happen and what may be the consequences of this.**

1. Cancer is caused by the presence of abundant oxygen in the metabolism, this may lead to cardiovascularisation.
2. Cancer is caused by the presence of lipid in the blood, the consequence may be difficult of breathed.
3. Cancer is caused by genetic changes in tumor cells, which lead to the aberrant expression of genes involved in regulating signal transduction, metabolism and other biological processes.
4. All are correct
5. Only a is correct

COURSE 6 BIOLOGY SYSTEM

**Q1. In thinking like engineers, biologists have been able to create machinelike analogues that faithfully explain the properties under study. Through the use of these metaphors, such studies have shown that robustness in life relies on several fundamental principles, find the right declaration.**

1. fail-safe mechanisms such as redundancy and diversity (eg, gene duplication or overlapping pathways) enable the organism to function even if one of its molecules or pathways is affected to a reasonable degree.
2. positive and negative feedback and feed-forward mechanisms result in properties such as metastability, oscillations, and signal amplification, respectively. These mechanisms bestow an organism with control functions such as ON/OFF switches and autoregulation (homeostasis).
3. The networked architecture of internal components allow task parallelization, thus containing local damage and preventing its spreading to the full system.
4. functional and physical properties, although related, work independently (decoupling). In this way, changes at the physical level (ie, protein misfolding) may not translate to the functional level, resulting in pathology.
5. A,b,c and d are correct.

**Q2. Emergent properties are present in all physiological systems and include the maintenance of …..?**

1. blood volume, blood pressure, tissue pH, or body temperature.
2. blood pressure, tissue pH, or body transpiration.
3. blood volume, blood pressure, tissue oH.
4. No one is correct
5. B is correct.

**Q3. Among other approaches, systems biology uses**

**network-based analyses as what?**

1. strategy for integration of data from genetic, gene expression, proteomic, and neurobiological experiments with the ultimate goal of identifying pathways involved in the pathogenesis of neurological diseases
2. The representation of real-world systems by the network analogy.
3. experiments with the ultimate goal of identifying pathways involved in the pathogenesis of breathing diseases.
4. No one is correct.
5. All are correct.

**Q4. There are two main approaches for studying networks, which ones?**

1. structural, also referred to as *topological analysis,* which examines the architecture of the system (network connectivity patterns).
2. The representation of real-world systems by the network analogy and the integration of data from genetic, gene expression, proteomic, and neurobiological experiments.
3. dynamic analysis, which examines how networks evolve over time by changes in the number of nodes and in their connections.
4. Only A and C are correct
5. All are correct.

**Q5. Give an example of pathway analysis and**

**genomic convergence in PD**.

a. ephrins.

b. the integration of genetic and gene expression studies to support the involvement of the axon-guidance pathways (ephrins, netrins, semaphorins, slits and their receptors, and intermediate proteins).

c. netrins

d. intermediate proteins

e. any of them are true