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Interactions Environmental Processes and Development of Human Organisms Activities Via Mechanisms of Mental Activity from the Point of Views of Biophysics, Biochemistry and Thermodynamics

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ABSTRACT

The article studies development of human organism in condition interactions with environment activity. There were described the role of solar processes in forming both non-living substances and living organisms through, from the one hand, germination living substances and also processes germination prokaryotic organisms and, from the second hand, germination living substances and also processes germination prokaryotic organisms which peculiarities were presented. Further there were elucidated dependence eukaryotic lives on Environmental influences of Solar system via creating mechanism maintenance stability an open thermodynamic system of an eukaryotic organisms according to famous Prigogine theorem. Thus there were described in details mechanisms maintenance stability an open non equilibrium non linear thermodynamic system of human organism in which Basic Internal Energy (E_{bas}) as builded bonds into molecule and atoms, bonds among compound processes of open thermodynamic biologic system, as inherited energy of genomic processes, bonds processes development of open thermodynamic system of an organism form Basic Internal Energy of Molecular Bonds ($E_{bas_MolBonds}$), Basic Internal Energy of Trophic Processes (E_{bas_TroPr}) and Basic Internal Energy of Mental-Soul Processes (E_{bas_MenPr}). At last it was described mechanisms operations of different receptors between an organism and Environment as well as neurons cellular mechanisms with environmental interactions causing development and maintenance stability Basic Internal Energy of Mental-Soul Processes (E_{bas_MenPr}), of Trophic Processes (E_{bas_TroPr}) of Molecular Bonds ($E_{bas_MolBonds}$) that form mental peculiarity of an organism.

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Received: July 18, 2022; **Accepted:** July 25, 2022; **Published:** July 28, 2022

Keywords: Internal Energy of an organism, Stem cells, Basic Internal Energy in neurons, Trophic Processes, Molecular Bonds, Mental-Soul Processes

Introduction

Interactions between a human person and Environment are two peculiarities: Interactions of human organism with natural Environment and Interactions of human person's mentality in human society by mentalities of people society how Environment. Influences of natural Environment on an organism are as the positive influences as well as the negative influences. The mechanism maintenance stability Internal Energy of an organism resist the negative influences in order to support stability Internal Energy of an organism. Resistance to negative environmental influences is carried out by external Work of an organism (W_{ext}). The maintenance stability Internal Energy of an organism is carried out by internal Work of an organism (W_{int}). Thus the human open thermodynamic system of an organism is subjected to the first law of thermodynamics: $H = \Delta U + W_{ext} + W_{int}$ (H – Entalpy, ΔU – Internal Energy, W_{ext} – external Work of an organism, W_{int} – internal Work of an organism). Interactions of human person with human society as Environment promote development of the open thermodynamic system of a human organism via leading to perfect human mental peculiarity which mechanisms are explained below

from points of views of biophysics and biochemistry.

The Role of Solar Processes in Forming Both Non-Living Substances and Living Organisms

The stability Internal Energy via balance fusion processes & fission processes in Sun of solar core cause balance thermonuclear synthesis via inward pressure & dissipation thermal energy into Environment via outward pressure. The pressures and temperatures in solar core are high enough in order to force both fusion and fission, which are nuclear reactions whereby some nucleus merge into Sun. These nuclear reactions form units energy which are distributed via energy quanta corresponding to measure of Plank Constant $h=6,62607015 \times 10^{-34}$ J/s or Reduced Plank Constant $[\hbar=h/2\pi]$ value $\hbar=1.054571800 \times 10^{-34}$ J/s [J – joule, s – second] Besides these particles of energy quanta are formed simultaneously as synthesized nuclear particles via concentration energy according known Einstein formula $[E=mc^2 \text{ and } m=E/c^2]$ as well as also dissipation radial thermal energy which cause solar radial waves [1, 2].

This radial energy reflects as fusion processes of solar thermonuclear synthesis as well as fission processes of solar nuclear thermal dissipative energy [1, 2]. Just dissipation of very high temperature as thermal energy into environment cause the

waves of radial energy which consist of far higher wavelength than of infrared radiation and of far lower wavelength than wavelength of ultraviolet radiation inducing as positive particles due to positive quanta of energy as well as negative particles due to negative quanta of energy. The waves of positive radial energy carry the mechanism of inducing synthesis positive particles in nucleus of atoms. The waves of negative radial energy carry the mechanism of inducing synthesis negative particles in electron layers [K, L, M, N, O] and electron orbits [s, p, d, f] in which the one radial energy quanta form electron layers numbers and the other radial energy quanta form orbital quantum numbers. Thus it is occurred filling with electrons both orbits and layers for synthesized atoms causing by waves of corresponding to radial positive and negative energy.

Hence the both of high enough pressure of thermal energy (Q) and different wavelength energy stimulate photochemical reactions forming simple inorganic ions and molecules as H₂, O⁻² and O², N², CO² etc. in Ionosphere and Atmosphere [3]. Besides the waves of radial negative photons knock out electrons from semiconducting photoelectric cell realizing photoelectric effect of electric current. Just differential of thermal energy is equaled differential of entropy multiply Kelvin temperature, corresponding to second law of thermodynamics: $dS = \delta Q_{\text{revers}} / T \leq \delta Q / T$; or $dQ = TdS$ [S – Entropy, Q_{revers} – thermal reversible energy; Q – thermal energy; T – Kelvin temperature]. The some elements are formed in Planet-Earth as Silicon (Si) existing via Silicon dioxide (SiO₂) which creates via great terrestrial pressure and high temperature at the depth of the Earth. The great terrestrial pressure and high temperature promote forming minerals how coal, petroleum and so on. Hence solar gravitation influences on Planet-Earth especially on Earth core that exerts sometimes orogenesis. Being subjected to thermodynamic probability of Boltzmann theory, combination high enough thermal energy (Q) and different negative wavelength energy of some waves radial negative energy forms different combinations covalent bonds and ionic bonds in organic molecules of living organisms. It is well known the role of Sunlights in synthesis vitamin D₃ (ergocalciferol). Just energy ultraviolet rays of wavelength 290 – 315 nm promotes transitions 7-dehydrocholesterol into previtamin D1 and further; previtamin D1 into previtamin D3; previtamin D3 into vitamin D2 [4]. Also the waves of radial energy [ultraviolet rays especially] exert biologic life at spring [different beetles, May bugs, fly and the other insects as well as viruses which can not live outside of living organisms because they have no own respiratory systems]. Furthermore it is known that ultraviolet rays of wavelength lower than 200 nm are possessed carcinogenic property and can induce oncogenesis being formed due to affecting cells by viral oncogene [v-oncogenes]. Thus it is meant, that ultraviolet rays can promote proliferative processes of biologic lives [4].

Solar Radiation Causes Germination Living Substances and Processes Germination Prokaryotic Organisms

Being carriers of solar energy via exhibiting solar balance fusion & fission, the solar radiation of positive and negative energy cause as compound substances as well as simple substances corresponding to balance increase Entropy & decrease Entropy according second law of thermodynamics. Indeed balance fusion & fission of radial energy induces balance positive particles & negative particles and balance positive charged ions & negative charged ions. Distribution balance decreased Entropy & increased Entropy exerts compound biochemical and biophysical processes which stimulate production compound organic molecules and inorganic molecules corresponding to quanta of radial energy according Boltzmann theory and Einstein formula (see above). Thus these influences of solar radial energy generate forming also solid Planet-Earth and

gaseous medium of Atmosphere with produced substances in them. The maintenance stability Internal Energy and Internal Medium of Atmosphere and Planet-Earth promotes germination living organisms as the open thermodynamic systems. Just exchanges by energy and substances between thermodynamic systems of living organisms and thermodynamic system Atmosphere promote maintenance stability Internal Energy both open thermodynamic system of Atmosphere and open thermodynamic systems of living organisms on Planet-Earth substantiating by famous Prigogine theorem. Thus it's meant that balance fusion & fission inducing special quanta radial energy promotes processes germination living matters and influence also on processes reproduction as prokaryote as well as eukaryotic organisms. The processes germination simple prokaryotic organisms of viruses and bacteria occur due to permanent influences of solar radial energy. The influences solar radial energy causing oscillations either moderate decreased Entropy or moderate increased Entropy promote as anti-apoptotic processes in living organisms as well as apoptotic processes in living organisms.

Just viruses are smallest infectious agents which are germinated and replicate only inside the living cells of different organisms because viruses have no electron transport chain of oxidative respiratory system: Complex I, Complex II, Complex III, Complex IV, Complex V. Viral particles consist of two or three parts (5): 1) The genetic material consists of either DNA or RNA long molecules which carry genetic information; 2) The protein coat being produced by viral DNA/RNA, called the capsid, which surrounds and exert the genetic material via kinases functions; and 3) In some cases, an envelope of lipids surrounds the protein coat, they are outside a viral cell as protected material. Just there are different opinions: whether viruses are a form of life, or organic structures which interact with living organisms. Although they have genes, they have no electron transport chain. They cannot naturally reproduce themselves outside a host cells – although bacterial species such as rickettsia and chlamydia are considered as living organisms despite of the same limitation. However viruses have own prokaryotic haploid cellular cycle which they use in combination with eukaryotic diploid cells' cellular cycle in order to reproduce themselves in assemble within affected cells [5]. Thus viruses can be defined as pathologic alive promotor of affected living cells which are produced by solar fusion radial energy permanently. Therefore viruses can infect all types of lived cells such as human organisms, animals and plants as well as microorganisms, including bacteria, which are named bacteriophages. The initial viral affected cells occur due to weak defensive processes of both immune cellular and immune humoral mechanisms in an organism which are exerted by T lymphocytes and B lymphocytes causing production immune antibodies and phagocytes. These weak defensive immune cellular and immune humoral mechanisms are caused either by harmful factors of environment (human dirty factors, technological harmful factors, smoking, and other carcinogens) or harmful influences some solar rays quanta (for example, carcinogen property of solar rays' wavelength lower than 200 nm). Then after initial infection disease causing by viruses, it is occurred transmission infection to other persons. Hence there are occurred often influenzal epidemics as well as the other epidemics. Also there appear in the same mode HIV viruses, Corona viruses diseases and the other viral diseases, including v-oncogenes causing oncologic diseases. The simple organisms, producing by corresponding quanta of solar radial energy, are prokaryotes developing via haploid cycle. There are bacterial viruses named bacteriophages which are subjected to transduction into plasmid, causing conjugation and transformation [6, 7]. The transduction of bacterial DNA is occurred under the

influences of the bacteriophage's genes DNA on bacterial genes DNA [6-10]. Transformation affected DNAs are a common mechanism of affected prokaryotic cells by bacteriophages [11-15].

Eukaryotic lives Depend on Environmental Influences of Solar System

Different prokaryotes have either important useful function for an organism, e.g. producing Vitamin B12 by *Escherichia coli* in an organism's large intestine, or harmful function causing pathologic processes HIV disease, influenza, Corona Viruses (SARS-CoV-2) etc. However development of eukaryotic organisms from germination up to growth and down to death display arising processes via decreasing Entropy in young age of an organism and then withering away processes via increasing Entropy in old age of an organism. Eukaryotic organisms are open non equilibrium non linear thermodynamic systems which are subjected to thermodynamic laws. Just it is the mechanism maintenance stability Internal Energy of eukaryotic organisms according to first law of thermodynamics [$H = \Delta U + W$ (H – Entalpy, ΔU – Internal Energy, W – Work of an organism)]. Stationary State of open non-equilibrium non-linear thermodynamic system of an able-bodied organism and also some Quasi-stationary State of open non-equilibrium non-linear thermodynamic system of a sick organism are characterized by stability of Internal Energy (ΔU) (stable temperature 36,0°C – 36,9°C by which all enzymes operate, stable PH = 7,35 in blood and neurolymph etc.). The mechanism maintenance stability Internal Energy of an open non-equilibrium thermodynamic system of a living organism is proved by outstanding Prigogine Theorem [16].

Here is the Theorem Prigogine

[The symbols: Entropy – S; Stream of Substances – Js; Stream of Energy – Je; Force of Substances – Fs; Force of Energy – Fe; Phenomenological Streams of Combination Substances with Energy – Zse or Zes, of separate Substances and Energy – Zss and Zee] $dS = JsFs + JeFe > 0$. Conjugated flows: $Js = ZssFs + ZseFe$ and $Je = ZeeFe + ZesFs$. $dS = (ZssFs + ZseFe)Fs + (ZeeFe + ZesFs)Fe = ZssFs^2 + ZseFsFe + ZesFsFe + ZeeFe^2 = ZssFs^2 + 2ZseFsFe + ZeeFe^2 > 0$, corresponding to the Onsager concept: $Zse = Zes$.

However there are $Zss > 0$; $Zee > 0$; $Zse > 0$ in Stationary State. It is known that there is not changed flow of Substances in Stationary State, i.e. inflows Substances are equal outflows Substances in Stationary State of an organism: $Js = 0$. The concentrations of Substances in Internal Medium of an organism (in blood and in neurolymph) are constants, i.e. the quantity inflow Substances into an organism are equal quantity outflow Substances from an organism. Hence there is the derivative dS from Fs , if it's $Fe = \text{constant}$ (the constant production calories for maintenance temperature 36,0°C – 37,5°C by which all enzymes operate). That leads to following formula $dS/dFs = 2ZseFe + 2ZssFs = 2(ZseFe + ZssFs)$, $2Js = 0$. The second derivative (flexon) from S is peer: $d^2S/dFs^2 = 2Zss > 0$ It corresponds to extreme point. It means that $dS \rightarrow \text{min}$. So the minimization increment of dissipation energy via minimization of gain entropy causes the stability of the open non equilibrium thermodynamic system of an organism.

The common mechanisms regulation maintenance stability Internal Energy (stable temperature 36,0°C -36,9°C etc.) and Internal Medium (stable concentration substances in blood and neurolymph) in high organised eukaryotic organisms consist of three level regulation: highest level regulation [Central Nervous System], high level regulation [“Basic Equilibrium Constants of all kinds of metabolisms”] and low level regulation [“Equilibrium Constant of energy exchanges” and “Equilibrium Constant of metabolism”] [17, 18] (Figure 1). Also the common mechanism regulation maintenance stability Internal Energy and Internal Medium is supported by Hormonal system operations which influence as on metabolic processes via influencing through cellular receptors on some cellular functions. Besides an organism's cells create supplemental mechanism maintenance stability Internal Energy and Internal Medium as in an organism's cells as well as in an organism due to operation resonance waves of cellular capacitors [16]. However the common mechanisms regulation maintenance stability Internal Energy and Internal Medium in eukaryotic organisms are subjected to both positive influences and negative influences of Solar radiations displaying balance increased Entropy & decreased Entropy regarding to increased defensive mechanisms of an organism. Internal Energy (U) of an organism is maintained by External Works of an organism (W_{ext}) against Environmental influences on an organism according first law of thermodynamics. Just minimization gain increase entropy in an open non equilibrium non lineal thermodynamic system of an organism results in minimal shift balance increased gain Entropy & decreased gain Entropy into minimal increased gain Entropy during life of an organism maintaining stable Internal Energy of an organism according famous Prigogine theorem [16]. Besides such oscillations of balance increased gain Entropy & decreased gain Entropy occur during the life of an organism reflecting states of an organism's metabolism from its birth to death [19] (Figure 2.). Moreover these oscillations of balance increased gain Entropy & decreased gain Entropy corresponds to thermodynamic probability of distribution Entropy according to outstanding Boltzmann formula. The positive influence of solar radiation promotes life of the organisms via exerting as biochemical mechanisms regulation maintenance stability Internal Energy and Internal Medium of an organism as well as cellular mechanisms maintenance stability Internal Energy and Internal Medium of an organism. Just operation of the mechanisms photosynthetic processes in plants are stimulated by the mechanisms influences of solar rays on eukaryotic cells of plants. Although photosynthetic processes occur differently by different species, these processes always begin in plants when energy from light is absorbed by proteins in reaction centres which contain green chlorophyll pigments. In plants, these proteins are hold inside organelles called chloroplasts, which are most abundant in leaves' cells, also they are embedded in the plasma membrane of bacteria. In these light-dependent reactions, some energy is used to release electrons from suitable substances, such as water, producing oxygen gas. The freed hydrogen via the splitting of water is used in the creation of two further compounds that act as an immediate energy storage which means: reduced nicotinamide adenine dinucleotide phosphate (NADPH) and adenosine triphosphate (ATP), as the carriers of cells energy.

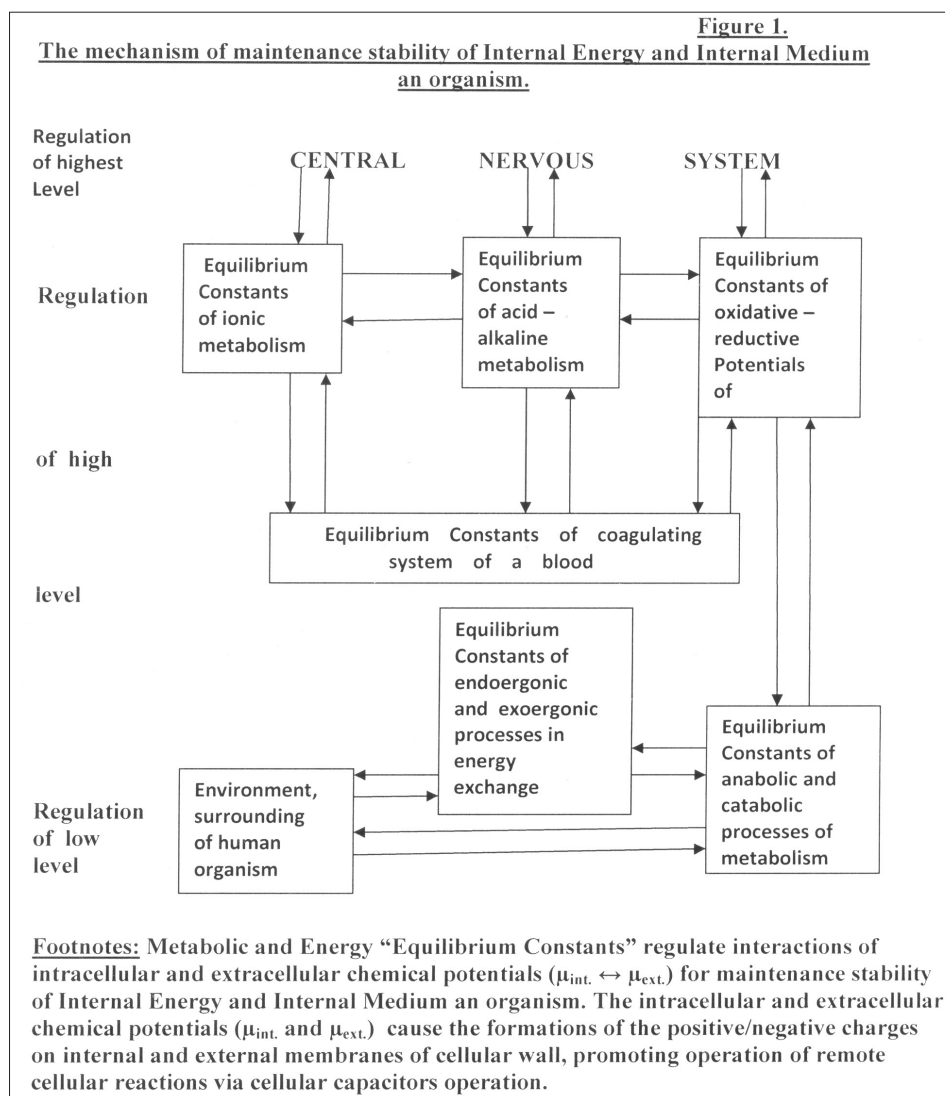


Figure 1

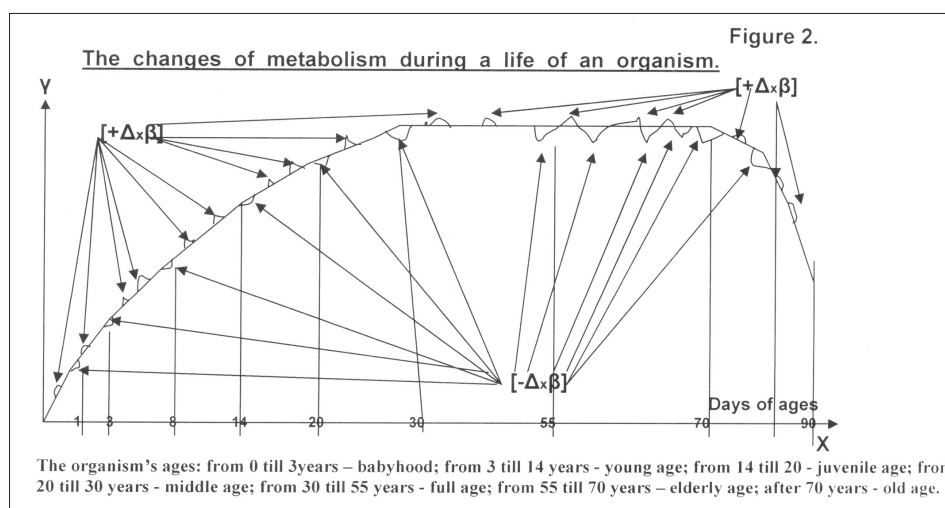


Figure 2

Vitamins as Cofactors are Produced by Solar Radiation Energy in their Operation

The operation solar radiations' photosynthesis produce Vitamin D₂ which is formed from natured ergosterol being named Provitamin D₃ [7-dehydrocholesterol]. Just provitamin D₃ or 7-dehydrocholesterol is located in a skin and in various tissues. Solar UV radiation transforms 7-dehydrocholesterol into Vitamin D₀ or cholecalciferol. Then cholecalciferol (Vitamin D₃) is transformed into Vitamin D₂ in liver. Vitamin D₂ takes part in metabolism calcium [Ca²⁺] and phosphorus (HPO₄²⁻) increasing permeability across cellular membranes of calcium [Ca²⁺] and phosphorus (HPO₄²⁻) that influence on mineralization of osseous tissue making pumps via rearrangement between bivalent ions {calcium [Ca²⁺] / magnesium [Mg²⁺]} and univalent ions {natrium [Na⁺] / potassium [K⁺]}. The rearrangement bivalent ions and univalent ions induces interactions between mineralization of osseous tissue and demineralization connective tissue influencing on vessels' muscular tissue and connective tissue due to ion pumps operations which exert also cardiovascular function, intestinal function and function other organs. Just the Ca²⁺ ATPase (PMCA) is located in the cytoplasm's membranes of cells and functions to remove calcium (Ca²⁺) from the cell. The plasma membrane Ca²⁺ ATPase (PMCA) and the sodium calcium exchanger (NCX) are together the main regulators of intracellular Ca²⁺ concentrations (20 – 28). Since it transports Ca²⁺ into the extracellular space, the plasma membrane Ca²⁺ ATPase (PMCA) is also an important regulator of the calcium concentration in both intracellular space and extracellular space [20-28]. Also balance mineralization & demineralization is regulated by interactions between cortical hormones especially mineralocorticoids which were produced from cholesterol too. Hence these are links between mechanisms of operation Vitamin D₂ and mechanisms maintenance stability balance glucocorticoids & mineralcorticoides, i.e. balance anti-inflammation hormones & pro-inflammation hormones. The direct actings solar radiation induce photosynthesis melanine in skin of an organism which defends against harmful actions solar energy ultraviolet rays of wavelength lower 200nm as carcinogens. Just UV solar radiations affect skin exerting tyrosinase that results in transforming tyrosine into DOPA (L-3,4-dihydroxyphenylalanine) creating catecholamines. Besides DOPA is transformed both into Eumelanine through processes polimerization and into Pheomelanine through cysteine – cysteinildopa processes Oxidation and Polimerisation. The photosynthesis of solar radiation affecting eukaryotic organisms occurs in following mode: The living prokaryotic and some eukaryotic organisms subjecting to solar radiations photosynthesis cause indirect acting both positive

influences and negative influences on eukaryotic high organized organisms. Thus solar radiation photosynthesis is a process which is used by plants and other organisms in order to convert solar radiation quanta energy into chemical energy that can later be released of the organisms' activities via energy transformation into substances. This chemical initial energy is stored in carbohydrate molecules, such as sugars, which are synthesized from carbon dioxide and water. Here is this simple scheme of photosynthesis in plants: $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$, i.e. Carbon dioxide + Water → Sugar + Oxygen. The photosynthetic process always begins when solar energy of rays' quanta are absorbed by proteins into cellular reactive centres which contain green chlorophyll pigments. In plants, these proteins are inside organelles called chloroplasts, which are in cells of leaves. In bacteria, these organelles are also called chloroplasts and are embedded in the plasma membrane. In these light-dependent reactions, some energy is used to tear away electrons from substances, for example such as water for producing oxygen gas. The splitting water, caused by freed hydrogen, is used in the creation of two further compound structures as reduced nicotinamide adenine dinucleotide phosphate (NADPH) and adenosine triphosphate (ATP) which operate in cells as energy storage. Just this stored energy is used for biosynthesis of more compound substances in plants and bacteria how proteins, hydrocarbons, fats as well as vitamins which operate as coenzymes. Vitamins can serve as precursors to many organic cofactors (e.g., vitamin C) or as coenzymes (e.g., vitamins B₁, B₂, B₆, B₁₂, niacin, folic acid). However, vitamins D have other functions in an organism [29,30]. Symptoms of bone pain and muscle weakness can be meant that person has a vitamin D deficiency. However, for many people, these symptoms are habitual. Also even too little vitamin D can prevent health risks. Low blood levels of the electrolytes have been associated with the Vitamin D deficiency [31-35]. Many organic cofactors are nucleotides, such as the electron carriers NAD and FAD, and coenzyme A (CoA), which carry acyl group (AcetylCoA). All vitamins, being exerted by appropriating quanta of Solar radiations energy into plants, are significant links in mechanism maintenance stability Internal Energy of the open non equilibrium non linear thermodynamic system of eukaryotic organisms. The liposoluble Vitamins [Vitamin D, Vitamin A, Vitamin K] are produced in animal organisms and in human organisms, and also being induced by solar violet rays in plants. Most of numbers of water-soluble Vitamins are produced in plants which cells are subjected to solar rays' quanta. But vitamin B₁₂ is produced by microbes Escherichia coli in human large intestine, which are formed due to influences solar rays on some food's products from plants.

Table 1: The Characteristic Vitamins of Indirect Production by Solar Radiation Energy

Vitamins	Chemical names	Coenzymes names or Consist	Additional component or Enzymes	Chemical group(s) transferred	Distribution
Vitamin C	Ascorbic acid	an electron donor for eight enzymes	None	Electrons	Bacteria, plants and eukaryotes
Vitamin B ₁	Tiamin	Coenzyme: thiamin pyrophosphate	Pyruvate and α -ketoglutarate dehydrogenase	2-carbon groups, α -cleavage	Bacteria, plants and eukaryotes
Vitamin B ₂	Riboflavin	Coenzymes: FMN, FAD, Coenz. F420	Enzymes: Flavoenzymes and ADP	Electrons	Bacteria, plants and eukaryotes
Vitamin B ₆	Pyridoxine	Coenzyme: Pyridoxal phosphate	Enzymes: Transaminase, Decarboxilase	Amino and Carboxyl groups	Bacteria, plants and eukaryotes
Vitamin H or B ₇	Biotin	Biotin	Acetyl-CoA carboxylase and Pyruvate carboxylase	CO ₂	Bacteria into intestine.
Vitamin B ₃	Niacin	Coenzymes: NAD ⁺ and NADP ⁺	lactate and malate dehydrogenases as well as ADP	Electrons	Bacteria, plants and eukaryotes
Vitamin B ₅	Pantothenic acid	Coenzyme A (CoA)	70 enzymes require coenzyme A (CoA)	Acetyl group and some acyl groups	Bacteria, plants and eukaryotes
Vitamin B ₁₂	Cobalamine	5-deoxyadenosyl cobalamine and Methylcobalamine	Methionine synthetase transfers Methyl group	Acil groups, hydrogen, alkyl groups	Bacteria in intestine.
Vitamin B ₉	Folic acid	NADPH coenzyme and Tetrahydrofolic acid	Dehydrofolate reductase (DHFR)	Methyl, formyl, methylene, formimino groups	Bacteria, plants and eukaryotes
Vitamin K	Phylloquinone	Menaquinone, Vitamine K ₁ , K ₂ , MK ₇ , MK ₁₁	Proteine Synthetases	Carbonyl group and electrons	Bacteria, plants and eukaryotes
Vitamin E	Tocopherol	α -, β -, γ -, and δ -tocopherols	Proteine Synthesis for coagulative processes	α -tocopherol us carrier proteins	Bacteria, plants and eukaryotes
Vitamin A	Coenzyme A Carotenoids	retinol, retinal, retinoic acid	α -carotene, β -carotene, γ -carotene, xanthophil β -criptoxanthin	retinol, retinal, retinoic acid	Bacteria, plants and eukaryotes

The Mechanisms Maintenance Stability an Open Non Equilibrium Non Linear Thermodynamic System of Human Organism

First of all, a living open thermodynamic system of body differentiates from nonliving bodies by such properties as self-replications by thermodynamic system besides as well as minimization of gain entropy for the stability of the open non equilibrium thermodynamic system according famous Prigogine theorem and Glansdorff-Prigogine theory of development thermodynamic system. Considering mechanism maintenance stability Internal Energy from point of view of thermodynamics, it must show regulative mechanism of an organism which promote stability Internal Energy of Stationary State thermodynamic system of an organism in norm. The first law of thermodynamics shows following equation: $H = U + W_{int} + W_{ext}$ [H – Enthalpy (Common Energy), U – Internal Energy, W_{int} – Internal Work, W_{ext} – External Work] [36]. Just Internal Work (W_{int}) of mechanism maintenance stability Internal Energy (U) of an organism both in ext and pathology occurs via biochemical mechanism of three levels regulation of mechanism stability Internal Energy: highest level regulation [CENTRAL NERVOUS SYSTEM], high level regulation [“Equilibrium Constant of ionic metabolism”, “Equilibrium Constant of acid – alkaline metabolism”, “Equilibrium Constant of oxidative – reduction Potentials of metabolism” and “Equilibrium Constant of coagulating system of blood”], low level regulation [“Equilibrium Constant of energy exchanges” and “Equilibrium Constant of metabolism”] [37,38]. (Figure 1). Stationary State of open non-equilibrium non-linear thermodynamic system of an able-bodied organism is characterized by stability of Internal Energy [the temperature 36,0°C – 36,9°C by which all enzymes operate, stable index pH=7,35 in blood and in neurolymph etc.] and Internal Medium [stable concentrations of substances in blood and neurolymph] according the first law of thermodynamics (36). Stationary State of open thermodynamic system of an able-bodied organism displays balance catabolic exergonic processes & anabolic endergonic processes corresponding to low level maintenance stability Internal Energy of an organism.

Basic Internal energy (ebasic) in Neurons' Cells of Central Nervous System is Energy for Maintenance Stability Internal Energy (u) of an Organism

Basic Internal Energy (E_{bas}) is inherited energy of genomic processes as bonds into molecules and atoms, bonds among compound processes of open thermodynamic biologic system of an organism etc. Thus Basic Internal Energy (E_{bas}) determines Genetic energy which Constants support famous Max Planck Constant $h = 6,63 \times 10^{-34} \text{J/s}$ and Boltzmann equation [39, 40]. $S = k_0 \ln \omega$ [S – Entropy, k_0 – Boltzmann constant, ω – thermodynamic probability]. Boltzmann constant is $k_0 = 1,38 \text{ Joule K}^{-1}$. Thermodynamic probability defines the quantity possibilities to produce microstates from macrostate of thermodynamic system. Entropy (S) is the measure of molecular chaos because increased Entropy reflects increasing microstates from macrostates leading to disorganization of thermodynamic system according Boltzmann formulation. Therefore Basic Internal Energy (E_{bas}) support macrostate versus microstate, i.e. decrease Entropy (S). The increased Entropy (S) reflects increasing microstates from macrostates determining as lives time of cells as well as duration life of an organism, according to Boltzmann theory. Also Basic Internal Energy (E_{bas}) stores energy which is received via inheritances. For example, Basic Internal Energy (E_{bas}) stores energy of genetics relating to heritable characteristics created by genes which are inherited from both parents, or from one of parent, either from grandfather, or from grandmother, or even from progenitor. Therefore Basic Internal Energy (E_{bas}) is inside of Internal Energy (U) using as genetic energy female and male gametes how main energy as well as supplemental environmental energy of foods obtained through mother organism and then independently. The part of the supplemental environmental energy is stored for forming Internal Energy (U) with replenishing Basic Internal Energy (E_{bas}) inside Internal Energy (U). Then there are following Basic Internal Energy of an organism: Basic Internal Energy of Molecular Bonds ($E_{bas} \text{ MolBonds}$), Basic Internal Energy of Trophic Processes ($E_{bas} \text{ TroPr}$) and Basic Internal Energy of Mental-Soul Processes ($E_{bas} \text{ MenPr}$) which are into neurons as Basic stem cells (BasStCells) [41, 42]. The operations of Basic Internal Energy (E_{bas}) induce sequence stem cells [Basic stem cells $\rightarrow$ Totipotent stem cells $\rightarrow$ Pluripotent stem cells $\rightarrow$ Multipotent stem cells $\rightarrow$ Oligopotent stem cells $\rightarrow$ Unipotent stem cells $\rightarrow$ transiting into type cells], which leads to cells' development via expression cellular cycle. The expression cellular cycle leads to increased quantity of cells via Progress pathway of Basic Internal Energy (Progr. E_{bas}), but, on the other hand, it occurs Regress pathway of Basic Internal Energy (Regr. E_{bas}) via cells aging leading to apoptosis of cells' destruction [16, 43, 44]. The Surroundings foods' energy are used for development of an organism and cells of an organism via physical works, mental works and the other works. Basic Internal Energy of Molecular Bonds ($E_{bas} \text{ MolBonds}$), Basic Internal Energy of Trophic Processes ($E_{bas} \text{ TroPr}$) and Basic Internal Energy of Mental-Soul Processes ($E_{bas} \text{ MenPr}$) are located into Basic stem cells [neurons] (BasStCells) and are received from parents being inherited energy [41, 42]. Whole this structure of Basic Internal Energy (Ebas) is the part of mechanism stability Internal Energy (U) in highest level regulation [CENTRAL NERVOUS SYSTEM] which locates in Basic stem cells [neurons of Central Nervous System] and promotes external mechanism maintenance stability Internal Energy (U) of an open thermodynamic system of a human organism via operation through different Receptors of Nervous System. These receptors are subjected influences by Environment and exert mechanism stability Internal Energy (U) of an organism.

Mechanisms Operations of Different Receptors Between an Organism and Environment

The receptors of system locomotion

The Receptors of system locomotion obtain oscillating energy from Basic Internal Energy (E_{bas}) of Basic stem cells [neurons]. The locomotion system of muscle spindles contain small specialized muscle fibers which are associated with two types of receptors - primary and secondary. These receptors receive neurons' oscillating Basic Internal Energy creating locomotion oscillating chemical potentials (μ). Thus the specialized muscle fibers produce forces and mainly influence on the signaling properties of the receptors. The primary receptor senses kinematic variables, including length of fascicles of the power producing muscle cells and a fractional power of velocity. These receptors provide monosynaptic excitation of the main muscle and synergistic muscles, pathways that constitute a major component of the stretch reflex. Secondary receptors detect mainly changes in the lengths of muscle fascicles. Their central connections are more widely distributed than primaries with theirs functions. The specialized muscle fibers also receive motor input from the spinal cord that can modulate the sensitivity of both receptors. Golgi tendon organs are located at the junction between muscle and tendon [45, 46, 47].

Lung Mechanoreceptors via Breathing Ventilation

Lung mechanoreceptors via Breathing Ventilation obtain oscillating energy from Basic Internal Energy (E_{bas}) of Basic stem cells [neurons]. These sensory receptors are found in a variety of places throughout the respiratory system and are responsible for a wide variety of behaviors. These behaviors include the following: Cough reflexes, Aspiration reflexes, Swallowing reflexes, Pulmonary chemoreflexes and so on. All these mechanoreceptors form chemical potentials (μ) transmitted by especial transmitters into special charges (q) [48].

Regulation of Heartbeats

Heartbeats obtain oscillating energy from Basic Internal Energy (E_{bas}) of Basic stem cells [neurons]. Sensory receptors near the endocardial surfaces of the ventricular walls initiate reflexes similar to those exerted arterial baroreceptors. These endocardial receptors diminish heart rate and peripheral resistance. Other sensory receptors have been identified in the epicardial regions of the ventricles. Ventricular receptors are exerted by a variety of mechanical and chemical stimuli. All these mechanical baroreceptors and chemical receptors form chemical potentials (μ) transmitted by especial transmitters into special charges (q) [48, 49].

Pain Receptors

Pain Receptors obtains oscillating energy from Basic Internal Energy (E_{bas}) of Basic stem cells [neurons]. Pain Receptors are also free nerve endings. These simple receptors are found in the dermis around the base of hair follicles and close to the surface of the skin (epidermis) where the hair emerges from the skin, widely distributed deep tissues (including the muscles and joints), and most of visceral organs. They respond to tissue injury or potentially damaging stimuli by sending nerve signals via charge (q) of changed chemical potential (μ) to the spinal cord and brain to begin the process of pain sensation. Pain Receptors are equipped with specific molecular sensors, which detect extreme heat or cold and certain harmful chemicals by sending nerve signals via charge (q) of changed chemical potential (μ). Physiological pain responses normally protect us from tissue damage by quickly alerting us to impending injury. Unlike acute physiological pain, chronic pathological pain, including neuropathic and inflammatory

pain, is often associated with increased activity and responses of spinal dorsal horn neurons, termed central sensitization [50-52].

Mechanisms of eyes' vision exerted by especial receptors

Sensory receptors often have to deal with wide ranges of stimulus amplitudes. Therefore, they need high sensitivity to detect weak stimuli, plus the ability to reduce their sensitivity if the stimulus is strong. In some cases, the maximum sensitivity approaches to the limits imposed by physics or chemistry. Human rods photoreceptors and some arthropod photoreceptors can detect single photons arriving in the eye, which is clearly the physical limit. The human ear can detect air movements of about 0.01 nm. The retina is the basic tissue of the eye which is the light-sensitive layer of eye. Thus the optics of the eye creates a focused two-dimensional image of the visual world on the retina. The cellular receptors in retina transform the rays' quanta of lights into energy and then energy into electric charge (q) through chemical potential (μ) which translates that image into electrical neural impulses to the brain of Central Nervous System to create visual perception. The neural retina consists of several layers of neurons interconnected by synapses and is supported by an outer layer of pigmented epithelial cells. The primary light-sensing cells in the retina are the photoreceptor cells, which are rods and cones. The photoreceptor cell's mechanisms of rods and cones detect eye's vision. The oscillating circuit in neuron (see below 3.3.2) is directly applicable to the exchange of energy between the electric and magnetic fields in electromagnetic waves of light in Environment. Rods function mainly in dim light and provide black-and-white vision. Cones function in well-lit conditions and are responsible for the perception of colour, as well as high-acuity vision used for reading. A third type of light-sensing cell, the photosensitive ganglion cell, is important for entrainment of circadian rhythms and reflexive responses such as the pupillary light reflex. Neural signals from the rods and cones undergo processing by other neurons, whose output takes the form of action potentials in retinal ganglion cells whose axons form the optic nerve being connected with corresponding neurons of Central Nervous System. Light accepting by the retina initiates a cascade of chemical and electrical processes via transiting chemical potentials (μ) into electrical charge (q) of nerve impulses which are sent to Central Nervous System of the brain's various visual centres through the fibres of the optic nerve [53, 54].

Mechanisms of Ears' Hearing Exerted By Especial Receptors

Driving auditory mechanisms of ears are occurred by mechanical mechanisms in the middle ear which create oscillating pressures on tympanic membrane by following ossicles: malleus, incus and stapes. The equilibrium of air pressure between middle ear and environment is supported by eustachian tube (auditory tube) connecting middle ear with nasopharynx and due to mastoid air cells. In inner ear, Cochlear hair cells are the sensory receptors of both the auditory system and the vestibular system in the ears. These cells possess stereocilia which connected to the tectorial membrane. Sound waves in the cochlea cause deflection of the hair cell stereocilia, which creates auditory stimulation via exertion oscillating pressure on balance extracellular chemical potential (μ_{extra}) and intercellular chemical potential (μ_{inner}) creating oscillating expression extracellular potential (μ_{extra}) which lead to pass substances through cells' walls according Theorell equation:

$dn/dt = -UcA d\mu/dx$; [dn/dt – quantity of diffusing substance molecules in the unit time; U – substance mobility; c – substance concentration; A – membrane area; μ – chemical potential; x – molecule distance from membrane].

Thus it occurred oscillating increase chemical potentials (μ) in cytoplasm of the hair cells which make oscillating increase an electrical charge (q) signal in the hair cell due to detecting movement sounds in environment [55, 56].

Sensory Receptors Contributing to Proprioception

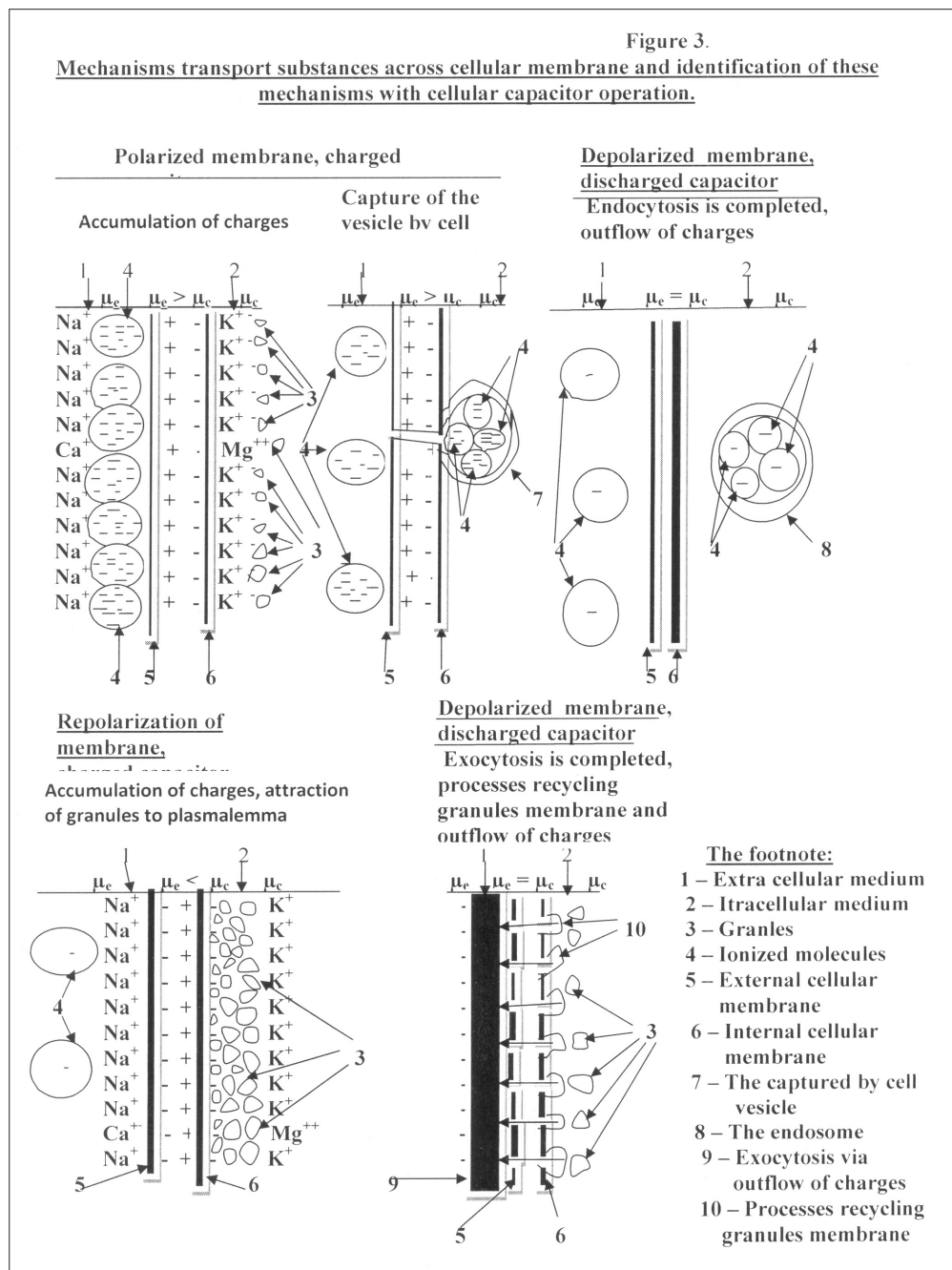
Sensory Receptors exert electric energy from environment to neuron's Oscillating Circuit mechanism which also obtain oscillating energy from Basic Internal Energy (E_{bas}) of neurons' Basic stem cells. Sensory Receptors are the driving mechanisms of functions of an organism's visceral organs. Obtaining influences on Receptors' Transmitters [mechanical, temperature, chemical, acidic, alkaline and other influences] from surroundings, Sensory Nerves transit electric energy to neurons in which Oscillating Circuits transmit this energy into electromagnetic waves causing Proprioceptions (see below sections 3.3; 3.3.1; 3.3.2). The Proprioceptions' electromagnetic waves contribute to reverse mechanisms transiting into electric energy which exert through motor nerves functions heart, lungs, hepar, intestine, kidneys as well as nonstriated muscles and striated muscles. Thus all sensory receptors in the muscles, joints, and skin are involved in proprioception. Muscle spindles are compound receptors which are coupled with the muscle fibers. They are fluid-filled fusiform capsules of connective tissue with bundles of small muscle fibers inside them. On the fibers there are two kinds of sensory nerves endings: the sensory nerve spiral endings of the primary muscle spindle afferent and the sensory nerve of flower spray endings of the secondary muscle spindle afferents. Both classes of muscle spindle endings determine stretch of the muscle through a signal of forming chemical potential (μ) transmitted by especial transmitters into special charge (q) of muscle length. The tongue mucosa and the tongue surface in particular are served by many types of mechanoreceptors, e.g. taste is based on chemical stimulation by especial transmitters. The endings in these receptors have been divided into diffuse, or free, endings and compact, or organized, endings. Some speech experts believe that free endings provide a general sense of touch in sensory control of speech articulation and that organized endings provide sensitive acuity in speech articulation via oscillating chemical potentials (μ) transmitting by especial transmitters into special charges (q) [57].

Neurons Cellular Mechanisms With Environmental Interactions Activate Mechanisms of Basic Internal Energy in Mental-Soul Processes ($E_{\text{bas menpr}}$), in Trophic Processes ($E_{\text{bas tropr}}$) In Molecular Bonds ($E_{\text{bas molbonds}}$) of An Organism

The Mechanisms of Neuron's Capacitor Operation

Intracellular medium touches on an inner membrane, causing the charge (q_{in}) on inner membrane corresponding to chemical potential (μ_{in}) of intracellular medium of neuron in Central Nervous System. Extracellular medium touches on an outer membrane, causing the charge (q_{out}) on outer membrane corresponding to chemical potential (μ_{ext}) of extracellular medium of neuron in Central Nervous System. Therefore the difference of chemical potentials ($\Delta\mu$) between an intracellular medium and an extracellular medium promotes the difference of charges (Δq) between an inner membrane and an outer membrane of cellular walls. Besides, there are the dielectric layers of proteins between the inner membrane and the outer membrane. All of it gives us possibility to make the following conclusion: Functioning membrane is analogous to functioning capacitor. The difference of charges (Δq) on an internal membrane and an external membrane of a cell promotes an attraction of the ionized molecules to the positive charge of membrane and the ions to the negative charge of membrane (Figure 3). Thus it is happened the locomotion of

ions and ionized molecules to the membranes charges. Membranous functions are analogous to capacitor functions. Just cellular wall consists of an inner membrane and an outer membrane which are charged with the different electrical charges (q_1 and q_2), having difference of potentials ($\Delta\phi$) or electric-field strength (U). The dielectric substances (proteins) are between an internal membrane and an external membrane, which cause the all conditions for mechanism of cellular capacitor operation, having the dielectric conductivity /dielectric constant (ϵ). The electric capacity (C) of a cellular capacitor is calculated using such equation:



Besides there are the some more equations:

$$U = Er; \quad C = q / Er; \quad \sigma = q / S; \quad E = \sigma / \epsilon_0$$

(E - field strength between cellular membranes, r – distance between cellular membranes, σ - surface density of charges on cellular membranes, S – the area of the each membrane, ϵ_0 - electric constant).

Thus the electric capacity of a cellular capacitor is equal:

$$C = \sigma S / Er = \epsilon_0 S / Er = \epsilon_0 S / r.$$

The equation of a capacitor electric capacity turns into such equation in the presence of a dielectric between membranes:

$$C = \epsilon \epsilon_0 S / r, \text{ i.e. the electric capacity of a capacitor increases in } \epsilon \text{ times.}$$

(ϵ - dielectric conductivity /dielectric constant)

These cellular capacitors in a cellular wall are divided from one another by hydrophobic non-conducting layers of lipids, transpierced through cellular wall. Therefore taking into account the determinative role of the dielectric conductivity for a capacitor electric capacity, it can assume that a cellular wall consists of the many capacitors having different dielectric conductivities (ϵ) and different capacitors' electric capacity (C) due to different proteins between cellular membranes.

Considering that the electric-field strength on a cellular capacitor changes in time via a sinusoidal graph, the equation of the electric capacity of a cellular capacitor is viewed so:

$$C = q / \Delta\phi \sin \omega t = q / U \sin \omega t; \quad \omega = 2\pi f$$

(C - the electric capacity of a cellular capacitor, q – electrical charge, $\Delta\phi$ - difference of potentials, U - electric-field strength, ω - angular frequency, f – frequency, t – time).

The wave functions of cellular capacitors are happened as linear function of decaying wave according to the equation:

$$u = U_n / r \quad (u - \text{instantaneous voltage, } U_n - \text{range of stress, } r - \text{distance})$$

Thus the more distance (r) induces the less instantaneous voltage (u).

Besides the structures of cellular receptors consist of both α -subunit protein and β -subunit protein which are the proteins with the properties of dielectric conductivity. The changes of the positions among these subunits between cellular membranes promote the changes of dielectric conductivity of cellular capacitor's receptor. Thus the structures of cellular receptors contribute to the different variable capacitors operations, which adjust themselves to wave functions of the various substances.

Thus the each neuron's wall is provided by different capacitors, and receptors of neuron's wall are provided by variable capacitors [16,58]. Hence neurons' walls are possessed by capacitors which produce resonance waves of different characteristics creating connections between all neurons of human brain.

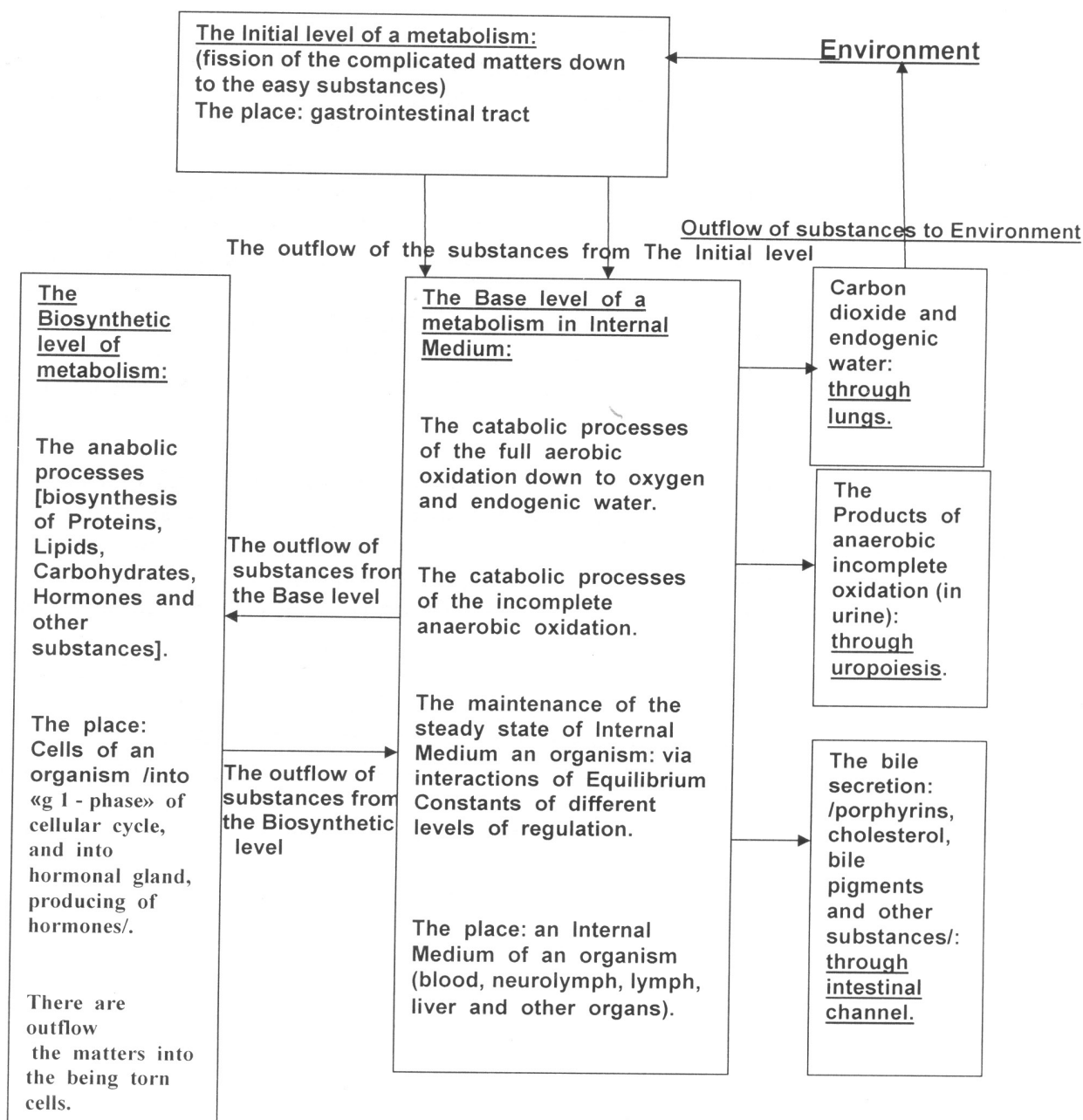
The Forming Basic Internal Energy of Mental-Soul Processes ($e_{basmenpr}$), of Trophic Processes ($e_{bas tropr}$) of Molecular Bonds ($e_{bas molbonds}$) by Neurons of Central Nervous System

Basic Internal Energy (E_{bas}) of different neurons of Central Nervous System is distributed energy among Trophic Processes ($E_{bas TroPr}$), Molecular Bonds Processes ($E_{bas MolBondsPr}$) and Mental-Soul Processes ($E_{bas MenPr}$). Neuron-cell contains cellular nucleus having double helix of nucleic acids DNA which double-stranded molecules has chemical potential (μ). Thus DNA double helix has electrical charge (q_{DNA}). Therefore this structure can be identified with inductor for its inductive properties (L). Thus neuron's cell contains nucleus with inductive properties Oscillating Circuit of inductor and cellular well with capacitive properties of many capacitors which energy are supplied by internal energy from Basic Internal Energy (E_{bas}) and external energy from metabolic processes of substances delivered from environment through gastrointestinal tract (Figure 4). The energy of inductor forms Inductance (L) and energy of capacitors forms Capacitance (C). Besides cytoplasm of neuron-cells possess of two inverse properties electric conductance and resistance due to containing as ions and ionic molecules as well as dielectric molecules [proteins etc.] and even some non-electroconductive hydrophobic lipids. Thus interaction of coupled properties Inductance (L) with Capacitance (C) and Resistance (R) forms Oscillating Circuit (LC) of neuron's nucleus (Figure 5). The electric Current (I) due to electric charge (q_{DNA}) of neuron nucleus Inductor (L) creates magnetic field with energy (EL) which is the electromotive force (emf) of Inductor:

$$E_L = \frac{LI^2}{2}$$

Figure 4.

Three levels of Metabolism causing excretion waste substances into environment.



Footnote: Basal metabolic rates (BMR) or Basal Work (W_{basal}) promotes stable state of Internal Energy (ΔU) of an organism stimulating metabolism and causing excretion waste substances into environmet.

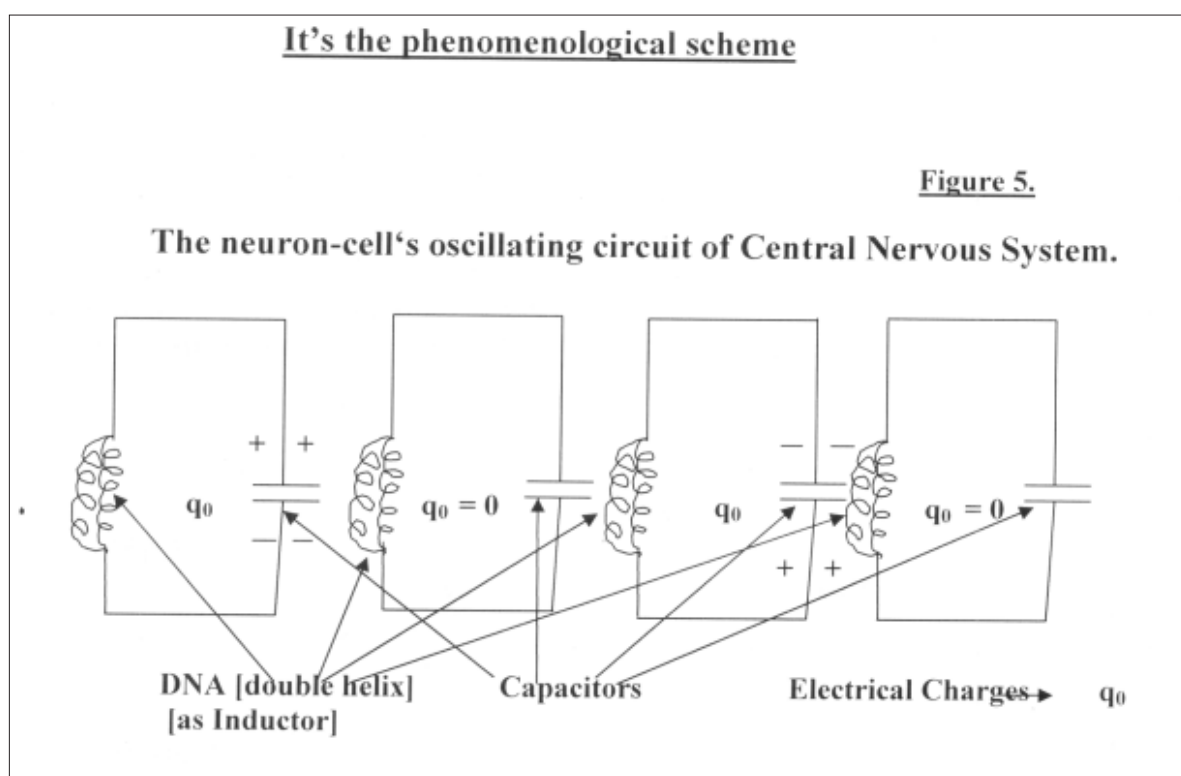
The electric Current (I) due to electric charge ($q_{\text{capacitor}}$) of neuron wall's Capacitor (C) creates electric tension of voltage (U) with energy (E_c) which is the electromotive force (emf) of Capacitor:

$$E_c = \frac{CU^2}{2}$$

There are occurred to exchange ratio electromotive forces of Capacitance (emf_C) and electromotive force of induction (emf_L) in following sequences of Oscillating Circuit: Increased current charge in capacitors results in stream for discharge of capacitors and increased magnetic field of Inductor. However magnetic flux creates emf in direction contrary to electric current in Inductor that cause resistance via slowdown discharge of capacitors in electric circuit. Therefore the capacitors are discharged through certain time (t_1) which is determined by inductance of inductor and total capacitance of capacitors via formula:

$$t_1 = \frac{\pi\sqrt{LC}}{2}$$

Thus electric energy of capacitors transits into magnetic energy of inductor after t_1 time. Then it is occurred decreased magnetic flux in inductor from maximum to zero because reduced magnetic flux causes change magnetic emf and increase capacitor emf and charge of capacitors from zero to maximum which occurs during t_2 time. Further it is occurred the opposite direction during t_3 time and so on t_4, t_5 etc times causing oscillation. Just all times are equal: $t_1 = t_2 = t_3 = t_4$ and so on. Thus magnetic energy of inductor (L) transits into electric energy of capacitors (C) and then vice-versa: from electric energy of capacitors (C) into magnetic energy of inductor (L). Each two intervals [t_1 and t_2 ; t_3 and t_4 ; and so on] will put together two halves of one complete oscillation in circuit. Besides it is occurred the change direction of electric stream and magnetic streams after each time interval (t_1, t_2 etc) which create changes positive and negative charges on membranes of capacitors (Figure 5). Thus the stream of electric energy is coupled with stream of magnetic energy creating electromagnetic energy (CL) which have following parameters.



The period oscillation (T): $T = 2\pi\sqrt{LC}$

The frequency of oscillations (f): $f = 1 / T = \frac{1}{2\pi\sqrt{LC}}$

The resistance in Oscillating Circuit (Re):
(R_{L+C} - total resistor) $R_e = \frac{L}{CR_{L+C}}$

Just the parameters of period oscillations, frequency of oscillations and resistance in Oscillating Circuit of different neurons determine as different common electromagnetic waves of each neuron as well as, being supplied by energy from different Receptors (via electric signals), single each neuron's Oscillating Circuit creates different electromagnetic waves which have different length waves with different frequencies and different forces as voltages. Sensory Receptors as well as the other Receptors via receiving oscillating energy from Basic Internal Energy (E_{bas}) of Basic stem cells [i.e. neurons] for perceptibility brain's neurons of interactions between environment and an organism obtaining from Sensory Receptors' electrical signals which are transmitted into electromagnetic waves of different quanta energy (Figure 5). Besides the oscillating circuits of energy (LC) are exchanged by corresponding neurons reciprocally which electrical signals are obtained by different neurons in Central Nervous System from the corresponding transmitters of receptors from visceral organs and skin of a human organism as well as from human community via people communications. These electrical signals from the corresponding transmitters of receptors form energy Molecular Bonds (E_{bas} MolBonds) from Basic Internal Energy which exert cellular proliferative processes in cellular cycle and induce cells' development through sequence of stem cells to type cells [Basic stem cells $\rightarrow$ Totipotent stem cells $\rightarrow$ Pluripotent stem cells $\rightarrow$ Multipotent stem cells $\rightarrow$ Oligopotent stem cells $\rightarrow$ Unipotent stem cells $\rightarrow$ type cells]. The obtained from receptors' outer electrical charges (q_{out}) by receptivity of neurons' Basic Internal Energy (E_{bas}), it is occurred transformed different quanta energy causing by oscillating circuit's electromagnetic waves of interactions between different neuron-cells in different places of brain in Central Nervous System. These exchanges with electromagnetic waves of different quanta energy between some different neurons form spatial notion about surroundings of environment and even about the changes in motion of environment. These exchanges with electromagnetic waves of different quanta energy between some different neurons create common electromagnetic wave of certain rate quantum energy which involve these different neurons for forming memory. The exchanges with spatial notions about surroundings and with memories between different human persons learn each human organism to compare and even to think. All these processes are supported by Basic Internal Energy of all neurons of brain in Central Nervous System which influence on oscillating circuits of all neurons of brain in Central Nervous System especially on inductors of all neurons, i.e. DNA of neurons (Figure 5). All these processes form energy Mental-Soul Processes (E_{bas} MenPr) from Basic Internal Energy creating human mental activity of thoughts, comparisons, jokes, fantasy, inventions, discovery and ever trickery and so on [58].

Conclusions

1. Living organisms are subjected to different environmental forces influences.
2. Human organism is an open thermodynamic system due

to mutual exchanges with environment both energy and substances which is subjected to thermodynamic laws.

3. There are occurred mechanisms maintenance stability Internal Energy of an open thermodynamic system of human organism in condition environmental influences.
4. The mechanisms maintenance stability Internal Energy of an open thermodynamic system of human organism are supported as by internal energy of Basic Internal Energy as well as environmental external energy of foods, oxygen and so on.
5. Basic Internal Energy provides energy for an organism's cells and organs function via dissipating energy through Trophic Processes (EbasTroPr), Molecular Bonds Processes (EbasMolBondsPr) and Mental-Soul Processes (EbasMenPr).
6. Interactions between environment and an organism are occurred via transmitting electromagnetic energy by Receptors' transmitters to brain neurons' Oscillating Circuit mechanisms creating both direct electromagnetic waves and reverse electromagnetic waves which exert Trophic Processes (EbasTroPr), Molecular Bonds Processes (EbasMolBondsPr) and Mental-Soul Processes (EbasMenPr).
7. The Mental-Soul Processes (EbasMenPr) exerted by joined Oscillating Circuits of different neurons create human memory and human mental activity.

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