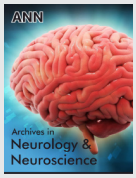

ISSN: 2641-1911

Archives in Neurology & Neuroscience

DOI: 10.33552/ANN.2023.15.000860

Iris Publishers

Research Article

Physics Life Psychiatry: Cellular Model and the ZPE

Ashok Kumar Mukhopadhyay[1]*, Manish Ranjan[2], Abhijeet Kumar[2], Abha Singh[2] and Amritapreeti Mukhopadhyay[3]

[1]*All India Institute of Medical Sciences, New Delhi, India*

[2]*North DMC Medical College & HRH, Delhi, India*

[3]*ABVIMS & Dr. RML Hospital, New Delhi, India*

***Corresponding author:** Ashok Kumar Mukhopadhyay, All India Institute of Medical Sciences, New Delhi, India.

Received Date: May 03,2023

Published Date: May 15, 2023

Abstract

Three unsolved problems in deep physics are uncertainty, symmetry-breaking, and dark energy. The life-scientists are in deep search of the minimum criteria of life, from the result of observation of the behavior of a live entity. Psychology, although, is not recognized as a discipline of science, psychiatry remains an important discipline of medical science. Psychology and psychiatry meet on an emerging new epidemic of three overlapping disorders, anxiety, stress and depression. This paper develops the connecting thread between three unsolved problems of physics, three signs of life at the subtle level, and etiopathogenesis of three common psychiatric disorders from the evidence available in cell biology.

Keywords: Cellular ZPE; Stress; Anxiety; Depression; Dark energy

The Overview

The debate between Worldviews of Newtonian-Einstein physics and Quantum physics, and at present sub-quantum physics revolve around the issue of certainty and uncertainty, determinism and indeterminism, and the determinism beneath indeterminism. According to several physicists, supersymmetry is the goal of science. Symmetry-breaking has been described as one of processes in quantum-classical transition. Any new creation starts at the point of symmetry breaking. Restoring the old symmetry, which is next to impossible, or achieving a new symmetry remains the dynamics in the process of creation. Finally, approximately seventy percent of the universe is constituted of intangible dark energy. The research question is how, where and when this dark energy is converted into tangible observable measurable energy and vice versa?

We face uncertainty in real life situations, try to overcome this and till such time this happens we are clouded with anxiety. In the course of life, the symmetry of its trajectory often breaks at multiple points in the course of the journey. We make efforts to restore the lost symmetry or achieve a new one! The dynamics we go through is stressful. Moreover, we are not isolated or disconnected islands in this universe. There are situations when the dark energy within, or in the environment, overwhelmingly surrounds us to evoke 'toxic' feelings. We feel disconnected with real-life situations of signals, sensations and tangible energy. That results in depression! Surprisingly, this anxiety, stress and depression are components of a new emerging epidemic in human psychiatry, probably a consequence of the ongoing cognitive evolution of the human brain.

One of the deep questions in science is how can we define life with minimum number of criteria, applicable both at the level of form (life-form) in the 4-D world, and formless (? *prana*) in higher dimensions? Claude Bernard coined the term milieu intérieur. Walter Cannon, defined its leading concept as homeostasis in his celebrated book, *The Wisdom of the Body* [1]. The ability to draw a homeostasis between the environment and the milieu interior is the 'sine qua non' of life operations. Without remaining confined to the ionic, osmotic, metabolic, and pH homeostasis, we may define "life" as intangible something within a live-entity by means of which it could draw homeostasis on uncertainty-certainty, asymmetry-symmetry and dark energy-tangible energy! We expect the stated criteria to overarch any live entity in this or other universe.

A Biological cell is the Model to experiment on the Idea

A biological cell could be used to set experiments for testing the idea that brings physics, life and psychiatry in one platform. The system cell is a testable model for Systems Holism [2]. The cell runs the course of its life literally with moment to moment uncertainty, a threat from death to which eventually the cell succumbs. Till such time, the cell has to remain engaged in uncertainty-certainty homeostasis, asymmetry-symmetry homeostasis and intangible and tangible energy homeostasis, the failure of which leads cell to the clinic/ward of "Emergency Medicine". Let us explain the three phenomena, one by one.

Even excluding environmental factors, cell survival could be considered its moment to moment struggle against death. Consider the uncertainty the cell suffers regarding how long the enzyme cytochrome C can remain actively confined within the two layers of mitochondrion! Within mitochondrial layers, the enzyme is involved in electron transfer mechanism and generation of ATPs. Driven out into cytosol it has no alternative but to initiate programmed cell death, called apoptosis. Three gene (BCL2, BCL-X1, MCL1) products continuously work to keep this enzyme within. Two gene (BAX, BAK) products work to drive it into cytosol. Five gene (BAD, BIM, BID, PUMA, NOXA) products act as sensors of the environment watching the circumstantial situations. With so much uncertainty in life, does the cell suffer from anxiety? The insight throws a challenge to the live cell technologists to picture this cellular anxiety!

Cell scientists are familiar with the continuous symmetry-breaking and symmetry-making processes within the cell. The cell suffers from free radical injury, metabolic injury, genotoxic injury, apoptotic injury and protein misfolding injury. This is more so during severe physical exercise and aging. Injured constituent parts are deftly removed. There is a continuous building up on the replacement of the lost constituents. Besides, there is an evolutionary conserved process of in-house cannibalism called autophagy, controlled by more than a dozen genes. The broken symmetry is rebuilt. Such a symmetry-breaking and symmetry-making process is very stressful situation for a cell, the homeostatic failure of which leads to pathological conditions like neurodegeneration, inflammatory bowel disease, infection like tuberculosis, and even malignancy.

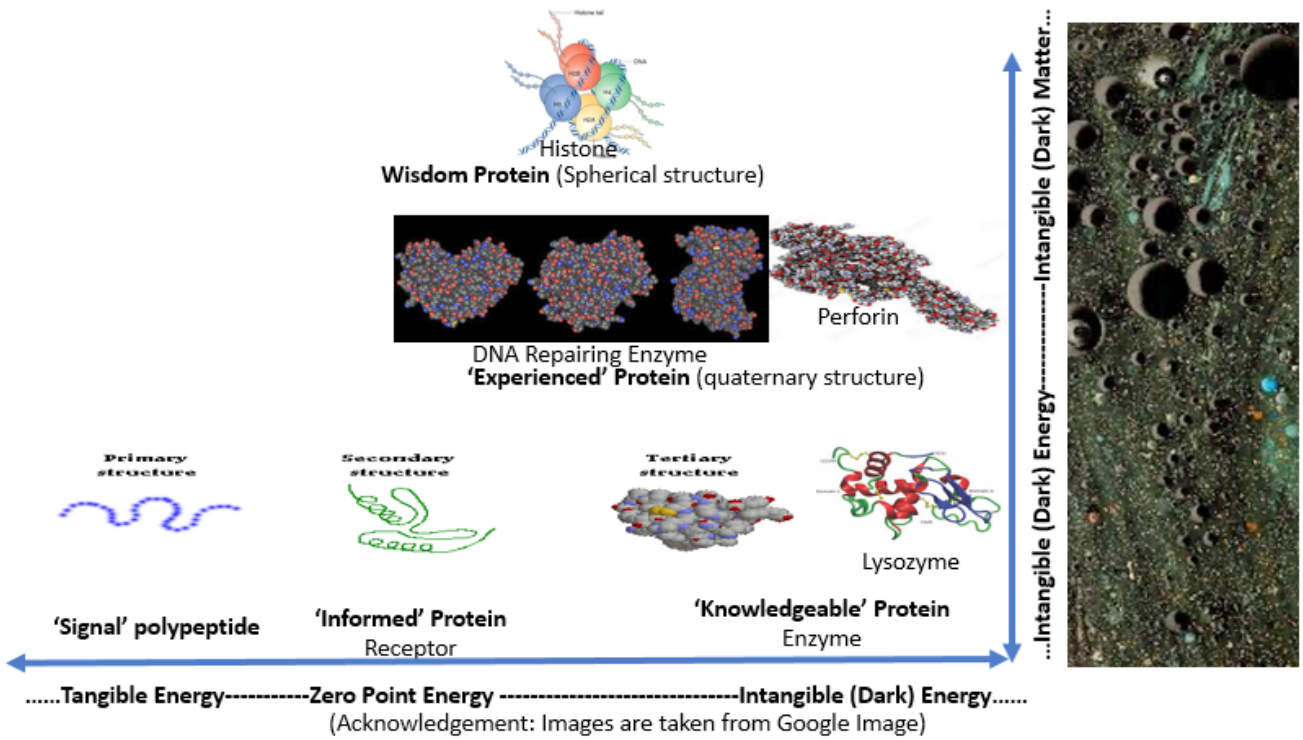

Figure 1: The figure shows the possible role of dark energy in protein folding. The spectrum of tangible and intangible energy through ZPE is shown on the X-axis. The spectrum of dark energy and intangible dark matter is shown on the Y-axis. Primary protein structure is a chain of amino acids, usually acts as a signal. Folding of protein structure into secondary, tertiary, and quaternary forms consumes dark energy. Towards the end of formation of 'wisdom' protein, may there be formation of dark matter, that nullifies repulsive activities of dark energy, and makes the cell more cohesive and creative!

Finally, it is known that the balance sheet of the cellular energy economics is not clean and above board. No known tangible energy accounts for the cellular protein folding. We can work on the research questions like where from some unaccountable intangible energy operates helping amino acid molecules to become a signal polypeptide, a polypeptide to fold and become an 'informed' receptor protein, an already folded protein molecule to acquire the tertiary structure and become a 'knowledgeable' protein like enzymes or different 'sensor' proteins (e.g., caspase 11 as sensor of LPS, NLRP3 as sensor for pyroptic and necroptic pores [3,4]), and a tertiary protein to acquire a quaternary structure and act as an 'experienced' protein such as DNA-repairing enzyme, granzyme, perforin etc.? Could there be any protein that may be really called a 'wisdom' protein, as a material representative of the "wisdom", Cannon speaks of? Wisdom is supposed to be the crystallized information compacted in a minimum confine of space, a sphere! Within a biological cell, there is a large centralized spherical protein, the histone, which many cell biologists think a DNA-driver, carrying the wisdom for the DNA in the nucleus [5,6]. Possible role of the dark matter and the dark energy in cell science is shown in Figure 1.

Dark energy repels the constituents. It repels signals from the self. Our research hypothesis is, a biological cell has access to the source of the inexhaustible intangible dark energy of the universe, and possesses a credible operational set up for its systematic use, the failure of which leads to "depression" of a cell, resulting from a disconnect of its ionic and molecular self from the environmental signal, sensation, and tangible energy. Our research hypothesis is that a cell has the ability to interconvert intangible and tangible energy. We are reminded of Craig Venter, creating synthetic microorganisms as a source of unconventional energy [7].

Further, the operation of a live cell cannot be explained by all physics. For classical and quantum physics, the sensible signal-based material world ends and begins at zero-point energy (ZPE), the cosmological constant of Einstein! ZPE is the beginning and the end of uncertainty, symmetry making and breaking, and is the bubble ground for the tangible and intangible energy. This could be described as the RIP (rest in peace) state for the signal-based, neural network-guided, mistake/blunder free, tightly programmed activities of robotic model of "intelligence", which is certainly not the same for the natural/cellular intelligence whose operation, although, prone to mistake and blunder, is loosely programmed with multiple open options, information-based, and organogram-guided. Even at the G_0 phase of the cell-cycle (?cellular zero-point energy state), the molecular robots of the cell continue to operate.

The ideas and concepts are summarized in the Figure 2.

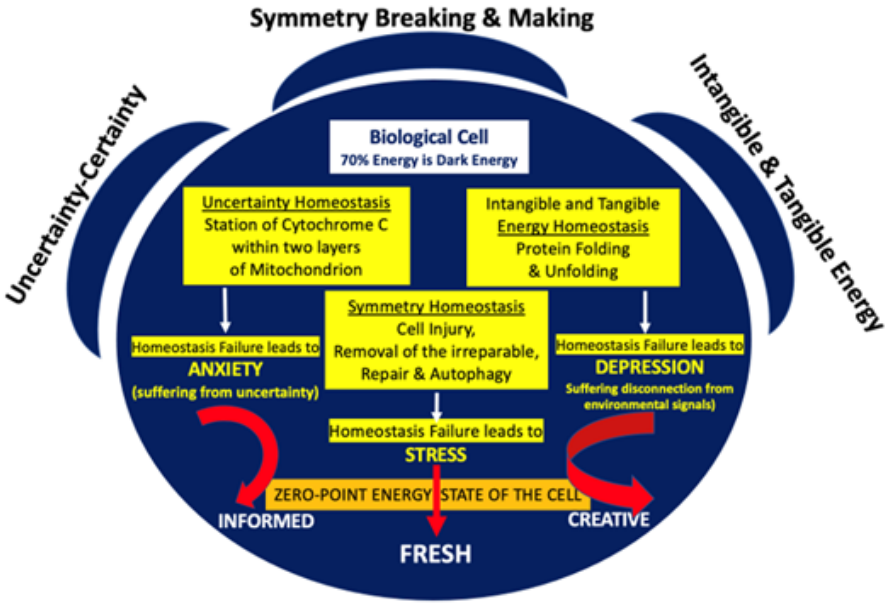

Figure 2: The environment is uncertain, faces perpetual trauma on its symmetry, and its 70% of the energy is the dark energy. These are the issues of deep Physics. The figure shows similar issues within a biological cell, the homeostatic mechanisms of which operate incessantly not allowing the cell to succumb to death. The failure of the mechanisms leads to Anxiety, Stress and Depression of the cells and its being. Anxiety Stress and Depression are Whole Body Disease. Like the brain and the being, the cell is presumed to have access to the zero-point energy through which, Anxiety is transformed into an Informed state, Stress into Freshness, and Depression into Creativity.

Zero-point energy is supposed to be the door of communication between systems biology and systems cosmology, systems physics and systems psychology [8]! To move forward in this frontier terrain across ZPE, attention of the cell scientists is drawn to construct the hierarchically stratified informational organogram of the cell organellosomes with the non-observable operators at the top tier, and their operations, and discover how the cell uses dark energy for the purpose of its own and for the environment!

Concluding Remarks and Perspectives

In conclusion, we can make several workable research hypotheses. (i) Anxiety, Stress and Depression are whole body disease, and are not merely confined to the psyche or neurons. (ii) The constitution of the behavior of the being is written in the constitution of the behavior of its constituent cells. (iii) Anxiety, Stress and Depression are interestingly related to three deep issues in physics. (iv) Above three pathological states could be investigated from the available cellular model according to the characteristics of homeostatic failure of any live entity. (v) Anxiety, Stress and Depression are interrelated, and have overlap since three homeostatic mechanisms have also similar overlap as observed from the cellular model. (vi) Accomplishment in such a homeostasis requires access of a live entity to the ZPE.

Further, the accomplishment in uncertainty management of the cell and the being transforms the anxiety of the cell and the being into an informed state. The success in asymmetry homeostasis makes the stressed cells and the being feel fresh. The dexterity in managing intangible dark energy leads both the individual and its cells teleologically from the depressive to a creative state. Of course, there is an inescapable role of the self of a self-organizing live system having access to the zero-point energy state in the context of individual cell, the brain of the being [9], and the environment.

This small paper opens up multiple new doors of science in physics, psychology, cell biology and cosmobiology. Microbial technology could be the way to harvest intangible dark energy from its inexhaustible source. The conclusions compel us to explore a new science across zero-point energy state of the environment, cell (?G0 phase) and the psyche.

Acknowledgement

None.

Conflict of Interest

No Conflict of interest.

References

1. Cannon BW (1932) The Wisdom of the Body. Kegan Paul and Co., Ltd. London, UK.
2. Mukhopadhyay AK (2015) Systems Cell: a Testable Model for Systems Holism. International Archives of Medicine 8(104): 1-10.
3. Jianjin Shi, Yue Zhao, Yupeng Wang, Wenqing Gao, Jingjin Ding, et al. (2014) Inflammatory caspases are innate immune receptors for intracellular LPS. Nature 514(7521): 187-192.
4. Broz P, Dixit VM (2016) Inflammasomes: mechanism of assembly, regulation and signaling. Nat Rev Immunol 16(7): 407-420.
5. Baumann K (2015) Chromatin. Drivers of nuclear organization. Nat Rev Mol Cell Biol 16(2): 67.
6. Pierre Therizols, Robert S Illingworth, Celine Courilleau, Shelagh Boyle, Andrew J Wood, et al. (2014) Chromatin decondensation is sufficient to alter nuclear organization in embryonic stem cells. Science 346(6214): 1238-1242.
7. Jonietz E (2002) Building Better Bacteria. MIT Technology Review. https://www.technologyreview.com/2002/12/01/40827/building-better-bacteria/
8. Mukhopadhyay AK (2022) Einstein's Abandoned Otherworld: How Conscious "Will" Manifests in a 4-D World? EC Psychology and Psychiatry 11(5): 01-08.
9. Mukhopadhyay AK (2019) Zero-Point Energy State of the Brain. Arch Neurol & Neurosci 2(5): ANN.MS.ID.000547.