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Consideration for Connection between Concrete and Abstract of Living System

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Living systems are established by the coordination of diverse systems in the environment, are responsive to change, and are stable over time. Many studies and ideas have been proposed on the mechanisms and general laws of living systems from the viewpoints of evolutionary biology, systems biology, and chaos theory. The mechanisms of evolution and coordination of living systems are also related to physics, probability theory, statistics, organization theory, and information science because they are the mechanisms of phenomena and organizations. In this study, we propose several hypotheses to explain the processes of organization and evolution of individual organisms and, in conclusion, we propose a hypothesis to generalize and describe the universal nature of living systems.

1． Individuals and Organizations

1.1.1 Hypothesis 1 Does fractionalizing time, assigning precise priorities, distinguishing between sharing and not sharing, and increasing the predictability of parts enhance the functioning of the system? Also, do difficulties, common enemies, the existence of currency, extensive time and space sharing, and the existence of common rules promote organizational coordination and evolution? Do individual stress feedbacks and the passage of time rationalize the system? On the other hand, are individuals more likely to behave cooperatively in systems with rational energy allocation and information transfer mechanisms?

1.1.2 Hypothesis 2 Will efforts to improve the functioning of the system to which an individual belong be rewarded by the individual's later protection from the system?

1.1.3 Hypothesis 3 Are acts of exchange and communication similar in the structure of practical interactions between individuals? Furthermore, do these and the mechanisms of absorption and excretion, and the adaptability of metabolism based on own interests and surplus energy, regulate roles and interrelationships within the organization?

1.1.4 Hypothesis 4 Does high homeostasis make it easier to organize and control the system?

1.1.5 Hypothesis 5 Does the coordination of processing speed of systems within a system enhance the homeostatic and organizing capacity of individuals? Are these benefits greater when the same resources are shared and more intermediately physically and temporally fractionated?

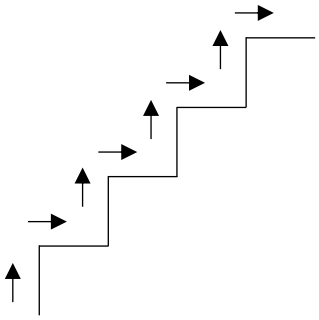
1.1.6 Hypothesis 6 Is it important for the smoothness of the biological rhythm waveform to safely pass through maxima and minima and not overload the system?

1.1.7 Hypothesis 7 Organisms capture the emergence of significant waveforms as opportunities, in the environment and within the body, by responding with hub sufficiency and surplus energy in networks lacking energy, matter, and signals, or by systems with a metabolic advantage?

(This is an untested hypothetical paper and additional experiments are needed to establish evidence.)

2. evolutionary process of life

2.1.1 Hypothesis Does life overcome energy barriers and increase stability as a system by abstracting information and systems



Overcoming such energy barriers is likely to occur in environments where large amounts of energy are supplied, such as at the boundaries of physicochemical phases or

2.1.2 Hypothesis Do feedback-seeking individuals evolve faster? Also, is aging a feedback by time?

2.1.3 Hypothesis Selection and evolution of organisms are, in a sense, the organization of traits or

2.1.4 Hypotheses Will the place where energy is supplied be an edge in space-time? Also, in the environment where energy is supplied, do fluctuations increase and communication between unstable materials in the stagnant system is facilitated and information is metabolized?

2.1.5 Hypothesis Do organisms shift between (1) a state in which they use themselves as a means to an end, (2) a state in which they use others as a means to an end, (3) a state in which they use themselves as a means to an end, and (4) a state in which they use others as a means to an end depending on the situation?

2.1.6 Hypothesis The reason why time-based resolution is superior to immediate resolution in many cases is that time allows for the decomposition of the problem into multiple systems, which are resolved by their coordination, thus fully utilizing the individual's resources, allowing for abstract resolution, and not disturbing the individual's homeostasis, or because

the individual's homeostasis is not disturbed.

2.1.7 Hypothesis Does the abstraction that life possesses itself generate a difference from the world?

2.1.8 Hypothesis The cell membrane is a structure that protects reactive substances, reinforcing good properties and diminishing bad ones, and these properties may have served an important function in the emergence of life

2.1.9 Hypotheses In diverse environments, the mechanisms of material transformation and interaction with the environment that can suffice the materials needed to build, make many species adaptive, and meet the demands of the environment will expand in time and space?

2.1.10 Hypothesis Are cellular membranes and networks systems that regulate harmonicity?

2.1.11 Hypothesis Is the network structure difficult to decipher and mimic?

2.1.12 Hypothesis Do organisms perceive pleasure and discomfort by the smoothness of metabolism of substances and information by metabolic networks and choose adaptive paths in space-time?

2.1.13 Hypothesis Are edges of chaos more likely to form at the hubs of spatio-temporal communication?

2.1.14 Hypothesis Are chaotic edges more likely to be generated in environments where catalysts are present and activation energy is reduced?

2.1.15 Hypothesis Are chaotic edges more likely to be established in a clean solvent?

2.1.16 Hypothesis Chaotic edges are created by the exchange of matter between individuals who come together to acquire energy or

2.1.17 Hypothesis Individuals on the edge of chaos are individuals who take risks and explore opportunities?

2.1.18 Hypothesis Individuals on the edge of chaos are individuals who decipher the needs of

their environment and communicate their own needs?

2.1.19 Hypothesis The edge of chaos is a system that collects energy, processes information, and has a long residence time?

2.1.20 Hypothetical Life System Divides Dynamic Equilibrium as a Continuous Process of Motion, Material Interaction and Communication into Energy Intake-Information Acquisition and Information Storage, Life and Death?

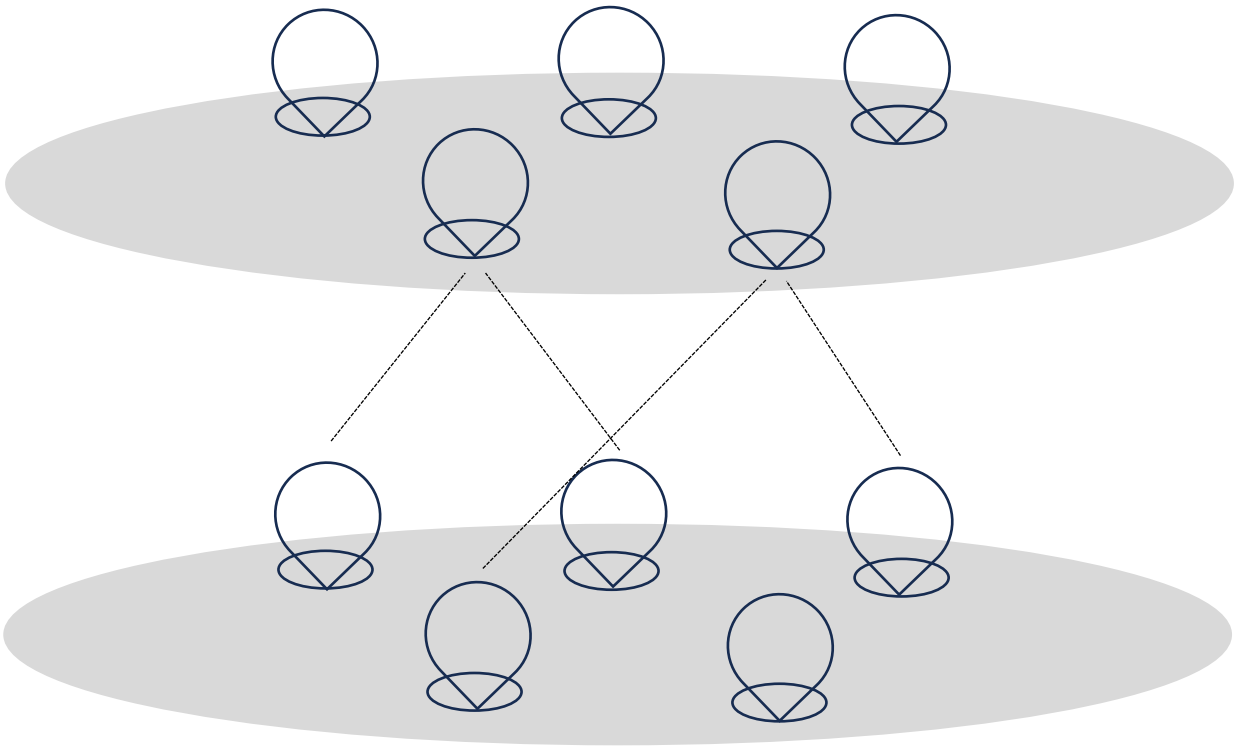
2.1.21 Hypothesis Can a group of organisms gathered for energy acquisition become a stable and evolving system in which micro- and macro-level cooperative mechanisms are established through temporal and spatial proximity and the exchange and sharing of materials, coordinated metabolic relationships, and synchronization of homeostasis?

2.1.22 Hypothesis Do organisms choose a spatio-temporal path that is harmonious with their own in the fluctuations of the law of increasing entropy of the environment?

3. Nature of Living Systems

3.1.1 Hypothesis When an isolated network is subjected to repeated inputs from and emissions into its surroundings, does it construct an internal world parallel to the external world? Do such mechanisms allow life to be autonomous, to grow, and to evolve?

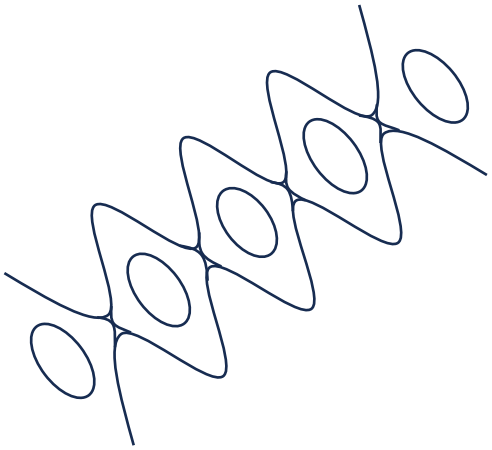
3.1.2 Hypothesis As selection pressure increases, only highly adaptive individuals are extracted from the filter pores and remain, sparsely distributed in the environment. Then, as they re-establish themselves as edges in the network, the abstraction of the ecosystem will increase.



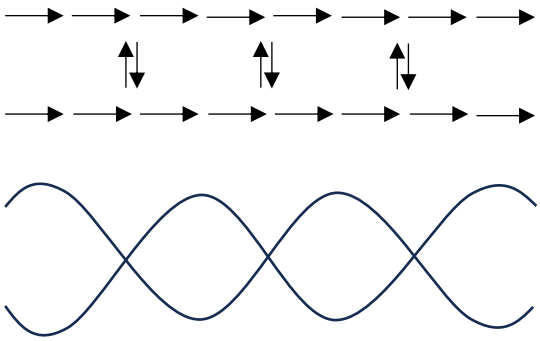
3.1.3 Hypothesis Do organisms resist homogenization into the environment by collecting probabilistically rare, system stability-enhancing mechanisms?

3.1.4 Hypothesis In general, is it important that physicochemical variables, phase motion, and the amount of information be in the optimal range for the maintenance of living systems, and have living systems evolved genetic information, biological systems, and morphology as an evolutionary process to increase the necessary sufficiency for these?

3.1.5 Hypothesis Is the living system a system that repeatedly separates and agglomerates, like a vine or a circulatory system, with the separating part analyzing and the agglomerating part supporting?



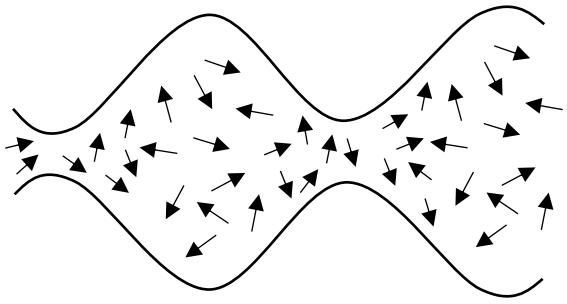
3.1.6 Hypothesis The essence of life is extensibility and their interaction, and nucleic acids satisfy these basic properties or



Is life a system that repeatedly gathers and exchanges information through these mechanisms? Or is it a system that divides and tries in times of peace and joins forces in times of trouble?

Furthermore, was the information possessed by both parties in such communication judged to be more accurate and more abstract?

3.1.7 Hypothesis In general, chaos reduces information and statics synthesize information or



3.1.8 Hypothesis Is life a system that persists and stays in space-time for a long time because of the complementarity of matter and solvent, structure and gap, expanding and contracting processes, aggregation and dispersion, accumulation and consumption processes?

3.1.9 Hypothesis Life is a system that extracts energy through the interaction of light, heat, and gravity with matter, abstracts information, prolongs reaction times, communicates with those systems and the environment through form, learns selection pressures, and generates adaptive homeostasis and responses, thereby becoming a systems that resist increasing entropy?

3.1.10 Hypothesis Life is either a system that flickers in space-time to engage in significant material and informational interactions with its environment?

3.1.11 Hypothesis Is life a system that combines repulsive substances to store energy and information?

3.1.12 Hypothesis Is life a system that copes with the complexity of its environment and the speed of time?

3.1.13 Hypothesis Is life a system that uses the interaction of heat, light, gravity, and matter to obtain energy and abstract information and time from the boundaries of uniformity and chaos in space-time?

3.1.14 Hypothesis Is the network structured to defend what matters?

3.1.15 Hypothesis Does the network protect the important ones in the center, favor communication, and increase the speed of information processing and storage?

3.1.16 Hypothesis Does the sphere structure limit space and does the network structure make good use of space?

3.1.17 Hypothesis Does the fact that life as a phenomenon is in dynamic equilibrium but the cell membrane is physically finite in size create the finiteness of life and the selectivity of matter and information?

3.1.18 Hypothesis Is the structure of life a structure that facilitates sharing what is in surplus and accommodating what is in short supply?

3.1.19 Hypothesis Is RNA, as a recording medium for genomes, suitable for protecting and storing information from environmental entropy because it is microscopic and thus has less physical interaction with the environment? Is the microscopic nature of the information storage medium also important for reading, transforming, and modifying information in solvents?

3.1.20 Hypothesis Organisms resist increasing entropy in their environment by increasing the discipline and homeostasis of their tissue structure and properties with amino acids that have limited structural curvature and mobility, optimal PH and different functional groups, and a sigmoid curve for optimal physical conditions Increased ability or

3.1.21 Hypothesis Information as an array of matter in a closed system maintains a balance between the preservation of past information and the acquisition of new mutations when there is a certain range of solvent disorder, and are such a mechanism related to the dynamic equilibrium and homeostasis of the organism, the conservation and evolution of the system?

(This is an untested hypothetical paper and additional experiments are needed to establish evidence.)

Discussion

The nucleotide chain may be said to have the following characteristics: it is a one-dimensional structure, which allows important sequences to be protected inside, it can pass through pores, there are no differences in interactivity due to morphological similarity, and because it is one-dimensional, its response to change is equivalent.

The nucleotide chain may be said to be a Markovian source of information that defines the temporal relationships of peptides.

Hydrothermal vents may be environments where information entropy is maximized and ideal source models can be applied.

Hydrothermal vents are places where entropy varies greatly, and may be said to be environments where the edges of chaos are likely to form. In addition, the fact that the vectors of temperature variation, material supply, and phase flow are in a constant direction at hydrothermal vents may have made them a favorable environment for the emergence and evolution of life.

On the primitive Earth, in the vicinity of hydrothermal vents where energy was continuously supplied, chemical reactions progressed continuously and various chemical reactions were coordinated. In an environment where energy is abundantly supplied, mutually beneficial and cooperative relationships may have been established, in which energy metabolism mechanisms and their reactants and products are exchanged for the stability of the system, and their cooperative evolution may have been easily generated. In such an environment, divergent ones would collapse and cohesive ones would cease, so that living systems with moderate phase entropy and harmonic dynamic equilibrium and homeostasis may have been selected for.

In general, in an environment of increasing energy and entropy, the value of time and information may change as the motion and interaction of matter and the relationship between micro and macro change.

Contact between adaptive individuals in space and time may have led to the sharing of adaptive nucleotide sequences, which may have contributed to the spatiotemporal expansion of the trait. Individuals with adaptive traits remain in the environment for long periods of time,

sharing genes with other adaptive individuals in close proximity. This sharing of genes from adaptive individual to adaptive individual may have resulted in the persistence of adaptive nucleotide sequences and traits.

The relationship between energy and information in life may be due to the polymerization of nucleotides by ATP-dependent dehydration-condensation reactions. It may also have been useful to separate and coordinate energy and information for use in living systems because energy stored in matter is bulky and highly reactive when immediately retrievable, while information stored in matter is not bulky and is stable over long periods of time when isolated.

Is energy used by the organism to communicate with the environment and similar individuals in order to construct and maintain physical form?

Also, the availability of energy facilitates overcoming internal and external energy barriers, and in general, life may use energy to overcome energy barriers and gaps in time and space. The edge of chaos may be established as a result of such overcoming of energy barriers and linkages in time and space. Also, the energy acquired by life may be used in the process of survival to acquire a time reprieve and to support temporal continuity.

Paradoxically, do organisms use the edges of chaos that are established as a result of the overcoming of energy barriers in the interior and the linkage of time and space to overcome energy barriers in the environment and to overcome gaps in time and space?

Life may also lower the energy barrier and increase the potential for temporal and spatial expansion by increasing the abstraction of information and systems.

There may also be a positive loop in which abstraction of information increases the likelihood of reaching adaptive times, places, and cases, which in turn leads to the acquisition of more useful information, and life systems may have used such a mechanism to dwell in time and adapt to their environment.

The fact that energy is dependent on mass, whereas information is dependent on sequence rather than mass, may be the basis for life's passage through less adaptive time and space as stored information.

In general, it can be said that the edges of chaos are actively seeking feedback because of the

large inputs and outputs taking place. Therefore, based on the assumption of divergence and convergence, the edges of chaos that have been selected for and remain may be more adaptive. In addition, the ways in which edges of chaos acquire stored energy and abstracted information during the process of evolution may make them more adaptive.

Natural selection amplifies useful differences and attenuates unwanted differences in matter, but was the beginning of an evolving life system in which matter, with its nucleobases and sequences of information, interacted and communicated with its environment through its motility and form? It may be an element of evolution that the medium in which information is generally recorded communicates with the outside world and is modified by feedback regarding its own adaptability.

The finite nature of biological systems may have resulted in spatial and temporal constraints, conferring the need to make efficient use of energy, information, and time.

Life may be said to be a system that effectively explores, harmonizes, and utilizes time, place, energy, information, and matter to transmit systems in time and space.

At the edges of chaos, energy and information may be collected and reaction times are stretched inside, allowing for more sophisticated processing of matter and information and appropriate reactions.

One might also say that living systems are systems that use the edges of chaos to collect entropy calms.

In general, the edge of chaos may be described as a system that processes inputs and outputs in an adaptive manner for itself and its environment.

Life may be said to stagnate in time by repeatedly inputting, stagnating, and outputting entropy using the edges of chaos.

Life may be said to function by a mechanism that prevents cessation and collapse, with the cohesive process inhibiting the divergent process and the divergent process inhibiting the cohesive process. Furthermore, energy, shortening of reaction time by catalysts, regulation of the system by equilibrium reactions, buffering by solvents, and exothermic endothermy may be used to regulate these mechanisms.

Is life a path formed by energy, information, and time cooperating with each other in a process of reciprocating sequence complexity and system complexity, learning selection pressure in the process of mutual communication, and exploring the edges of chaos?

Is life a system that enhances the ability to form spatiotemporal connections that make one's survival adaptive?

Is the organism a system that collects and conjugates stable interactions, increasing complexity and temporal retention?

Does the life phenomenon involve both the edge of chaos and the mechanism of crystallization, a process that handles entropy by the cleanliness of the solvent, the flow of the phase and the long time to phase transition?

Is the living system a system that uses the edges of chaos to cope with the indeterminacy of environmental change?

Does the living system predict changes in the environment by the order in which the subsystems are driven?

Is life a system that increases in complexity and stability through the supply of energy, probabilistic scarce opportunities, narrow space-time, exchange, and long passage of time, overcoming free barriers, passing through paths connecting these time-spaces, and accumulating their mechanisms?

Is the life system a system that harmonizes the degrees of freedom of the living system with the degrees of freedom of the world?

Life, using the edge of chaos emerged as the proximity of uniformity and chaos, acquires energy from the entropy groove or entropy jump stabilizes the edge of chaos, at a specific time and space, processes and stores information, stops interacting with the environment, passes through chaos or uniformity, and again, Repeat the process of selecting a specific time and space using the edge of chaos where uniformity and chaos approach?

Are the edges of chaos related to the sigmoid curve?

Is the living system a system that organizes spatio-temporal connections to enhance its own adaptability?

Life may be described as generating a necessary and sufficient edge of adaptive chaos in space-time through the process of development.

Is life a system that enhances its own adaptability by organizing energy, matter, environment, time, and information through the interplay of physical laws, motility, physical properties, and form in their continuity, spectrum, dimension, stochastic contactivity, and phase flow, eliminating noise, and transmitting abstraction?

Is a living system a system that balances past abstraction with future abstraction?

Do living systems amplify good mutations and attenuate bad ones, to increase system necessity and sufficiency for information transmission, to metabolize matter dominantly, to organize subsystems efficiently, and to stabilize the system to evolve?

Life may be said to stagnate in time by repeatedly inputting, stagnating, and outputting entropy using the edges of chaos.

Life may be said to be a system that uses the edges of chaos to acquire energy, abstract information, and time deferral in the process of referring to and interconverting chaos and uniformity with each other.

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