Grow Newtonian rigid inertia into parameter repetitiveness memory equivalent bio-inertia over the “super-simultaneousness” of quantum mechanics for growth turnover selection inheritance

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Research Article

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Grow Newtonian rigid inertia into parameter repetitiveness memory equivalent bio-inertia over the "super-simultaneousness" of quantum mechanics for growth turnover selection inheritance

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Abstract

Inversion energy is defined as parameter-against-gravity-internal-fluctuation, the non-simultaneousness in correlated internal fluctuations is quantizing time. Modified Newtonian Three Laws are, first: \( \frac{d}{dx} \cos x = -\sin x \), \( \frac{d}{dx} \sin x = \cos x \); second: \( \vec{F} = m \cdot \vec{a} + |m\vec{g} \int \vec{a} \cdot d\theta \rangle \); third: Wavelength = \( \frac{2}{n} L \), frequency = \( n f_0 \). Bio-systems are topological spaces that can process input objects into inversion energy for entropy-control by repetitiveness memory, the capability of equivalent procured inversion energy with memorized trigonometric repetitiveness by quantizing time is bio-inertia. Evolution grows the trigonometric folding equivalent capacity of a topological space. Schrödinger equation has only quantized energy but hasn’t quantized time thus inducing quantum collapse. We then write the gravitational growth turnover equation as \( \hat{H} \psi = E \psi + \sum_n | \cos \left( \frac{1}{n} \right) \rangle \) to reverse super-simultaneous quantum collapse for lifespan. Originating from elastic quantum scale differences between Planck regions and surface tension regions, bio quantum duality grows in vivo cross folded-surface tension region flow. Life relies on trigonometric negentropy procured from elastic entropy generation ground states and physically inherit by bio quantum growth turnover selection.

Introduction

The origins of life stand among the great challenging questions of our times. Substantial chemically and biological-based proposals have been made for different stages of the process as the possible starting points; however, these have so far not achieved even the simplest living systems. A major challenge is to identify the properties that distinguish living and non-living systems. Directly starting from the chemical or biological ingredients for life origin still does not answer the natural properties capable of narrowing the wide range of chemical components from non-living systems into a narrow but repetitive range for living beings in geological times. Bypassing general physical properties before life presents is the weakness of these proposals as well as the hindrance to further understanding of nowadays life functioning. In 2019, a report demonstrated 10⁹ levels of experimental gravitational binding between living and non-living beings to propose life physically originated
from a whirlpool; however, no quantizing time was present thus the understanding of life functioning and evolution is incomplete. Along with diverse indirect supportive physical impact experiments, the key measurements of gravitational binding are performed by damaging the living state of an organism to acquire weight differences thus can’t get a standard curve for the alive state. In 2020, new free-fall experiments of living organisms including human beings are designed to test in vivo gravitational binding thus new understanding is presented\(^3\). However, these updated models still do not include the mathematical equations for the modification of Newtonian first law thus failing to clarify the definition of bio-inertia, also lack the growth equation \( \hat{H}_\psi = E_\psi + \sum | \cos(\frac{1}{n} x) \rangle \) and the bio quantum (negentropy) growth turnover selection inheritance mechanism. This paper reveals this mechanism for the first time, not only defining in vivo topological space parameter repetitiveness memory equivalent bio-inertia and its inheritance mechanism but also experimentally extending the microcosmic rigid Planck quantum into macrocosmic elastic growable and inheritable quantum.

**Results**

1. **Horizontal quantization of gravity by bio quantum path experiment originates the bypassed inversion energy in conventional physics, vertical quantization of gravity by bottled liquids defines memory**

The bio quantum path model has been presented in the reports\(^2,3\), as shown at the top of (Fig. 1a) and (Suppl. Movie 1). The driving forces of a ball running on the path A, and B can be written as, \( dF_{\text{forward}} = F_0 + mg \cdot dtg\theta_A, \) \( dF_{\text{forward}} = F_0 + mg \cdot dtg\theta_B, \) respectively; \( dtg\theta_0 \) always changes and \( dtg\theta_A \) always equals to 0, then \( \vec{F} = m \cdot \vec{a} + | m \vec{g} \int tg\theta \cdot d\theta \rangle \). In the experiment, the ball on path B demonstrates a time advance effect that can’t be justified by conventional physics. We then define \( | m \vec{g} \int tg\theta \cdot d\theta \rangle \) as parameter-against-gravity-internal-fluctuation inversion energy, which means it originates from the persistent fluctuation (non-zero interval) of a physical parameter against gravity or gravitational superposition. Here, inversion energy is not a specific type of energy, any common type of energy such as oscillations, heat, lights, etc., once can persistently fluctuate against gravity will issue inversion energy. Different from diverse conventional energy types that are calculated by parameter values, inversion energy takes parameter effective fluctuation rounds to issue impacts and follows unique quantizing inversion superposition rules. As in the experiment, only enough rounds of fluctuations can overcome the environmental conditions to demonstrate the effects. If these primary fluctuations can establish new fluctuations (not necessarily from the same parameter sets) in that environment, the newly established
fluctuations still follow the same rules, once attain certain fluctuation rounds against gravity then can accumulate new inversion energy (The restriction of continuously establishing new fluctuations relies on the available shape difference of newcomers and the already existing fluctuations). The efficient shape of a fluctuation falls into a certain trigonometric curve, we use the term “bio quantum path” to differ from ordinary waves without the ideal shape. (In the horizontal experiment (Fig. 1a), a bio quantum path is the highest gravitational binding curve, a horizontal path is the lowest, and all other wave shapes should fall between these two extremities. As stated by the modification of Newtonian First Law, a bio quantum path represents the (folding state) shortest distance or most efficient gravitational binding inversion energy curve, mathematically, $\frac{d}{dx}\cos x = -\sin x$, $\frac{d}{dx}\sin x = \cos x$, therefore, inversion energy falls in a certain trigonometric curve pattern (the derivative of a function means the sensitivity to change of the functional output value according to its input value, on such a curve no matter which functional impacts are issued, the output and input are always composed of inversion, then the inversion energy accumulation is the highest, or the impacts only come from pure gravity and not any other parameters).)

The model of inversion energy originates elastic reference from the rigid reference system. The fundamental difference between a rigid and an elastic reference is the impact of the “repetitiveness” of parameters. Given a system with a group of correlated parameters, $x_1$ to $x_k$, each parameter has a certain “repetitiveness” number marked as integer $n_1$ to $n_k$ within the group. A rigid system uses a third-party reference for a large environment and conditions while most of the referred parameters happen their inversion processes are rare; therefore, this system never considers the parameter repetitiveness number that originates from inversion, no matter how much $n_i$ of a parameter $x_i$ is, the parameter $x_i$ is only dealt as $x_i$, the parameter-value $x_1$ to $x_k$ decides non-quantized results. An elastic reference only works for a relatively small group of correlated parameters inside an elastic enclosed space to differ from a large environment, under certain conditions, most of the parameters inside the space can rely on inversion interactions which is a kind of “repetitiveness” number shifting for sustaining; therefore, the parameter “repetitiveness” pattern or inversion state instead of parameter data decides the quantized results. (For a dead rigid space, one can only cram into limited numbers of objects with certain volumes. A topological living space can gulp much more objects by processing them into trigonometric curves and the space only utilizes these curves for internal fluctuations; therefore, under the condition of being capable of processing external objects into trigonometric curves and moving out badly curved excrements, it can continuously gulp new objects. An animal can eat food 500-800 times its body weight lifetime due to such a physical processing capability. Evolution is to accumulate the trigonometric curve folding equivalent capacity
inside the space, from here, common energy is for third-party reference equivalent and inversion energy is for folding equivalent inside a topological space, or data flow among rigid system parameters, and inversion or “repetitiveness” memory flow among elastic parameters). In the previous example, the state of the correlation among parameter $x_1$ to $x_k$ of a system is decided by the inversion repetitiveness pattern $n_1$ to $n_k$, any input parameter $y$ is only processed into factors to inversely change $n_1$ to $n_k$ or the fluctuation states of $x_1$ to $x_k$ for the system and never changes the parameter value of $x_1$ to $x_k$, such kind of a system is a parameter inversion-driving system. All bio-systems are such kinds. (Genomic copy number variation (CNV) is a typical example. CNV means sections of the genome are repeated and the number of repeats in the genome varies between individuals. Approximately two-thirds of the entire human genome is repeats and 4.8–9.5% of the human genome can be classified as CNV. Generally, the repetitiveness of parameters is gravitational inversion energy that is recessive for observation; here, the CNV has been dominantly fixed into a rate for measuring, which demonstrates utilizing parameter repetitiveness instead of value to respond to environmental shifting.)

For folding motivation, all bio-systems can’t directly use the incoming parameter data, only physically taking the inversion (energy) induced by them to equivalent with in vivo optimized repetitiveness state. (The previous $n_1$ to $n_k$ establishes a survival pattern, new input parameter $y$ is only processed to impact the $n_1$ to $n_k$ pattern, and the inversion of $n_1$ to $n_k$ in the process is the procuring inversion energy for that step; for a series of $y_i$, each step still needs the participation of the previous environment induced $n_1$ to $n_k$ pattern memory, not solely depending on parameter $y_i$ itself. E.g., if we touch a mechanic robot, it will record all the parameters directly related to the finger due to its lack of inversion structures to directly process the finger data into system inversion (energy). However, if we touch an animal, its body automatically records the inversion induced by the finger, and with no mechanism to record its direct parameters. Whether the animal feels happy or not is decided by the touch increases or decreases the trigonometric curves (repetitiveness) inside its body which is the bio-inertia “equivalent” capacity, not because of the touch parameters. We eat certain foods and our bodies never directly intake nutrients from them, only take inversion from these nutrients and then excrement the non-inversion remaining. In bio-systems, not only do structures such as DNA/RNA, proteins, cells, tissues, organs, and somatic bodies interact in the above elastic reference mechanism but also consciousness and language follow such ways. One person can discern another person, never directly use the parameter data of another person, only use the inversion induced by that person. Even a man and a woman falling in love still do not escape the mechanism.) For a senescence dying animal, common sense may judge it needs parameters such as foods, warm, RNA injection,
vaccines, stem cells, hormones, etc.; the functions of all these "parameters" can be published in tons of scientific journals; however, no matter what kind of "parameters" or combinations offer to it still can't save the life, since people can only offer these "parameters" and can't offer any parameter induced inversion energy to its body. Once it loses its self-inversion energy process and equivalent capability, death becomes inevitable. This fact reveals the above inversion energy memory-based processing mechanism. It is physically gradually evolved from non-living systems albeit the levels of the latter are lower; however, even a lower level never means they can be zero memory.

The bottom of (Fig.1a) demonstrates the macrocosmic vertical quantization of gravity and the inversion energy memory mechanism in free-fall experiments. The falling height $h$ has been separated into different grids as $h_1$ to $h_k$. For theoretical rigid bodies, gravitational potential $mg h_i$ can fully transfer into kinetic energy $\frac{1}{2}m V_i^2$ at each height $h_i$, then get: $mg h_i = \frac{1}{2}m V_i^2$; for non-rigid bodies such as our half bottle of water VS a half bottle of oil experimental pair, the equation is: $mg h_i = \frac{1}{2}m V_i^2 - |mg \int t g \theta_i \cdot d \theta_i| \downarrow \downarrow$, which means part of the $mg h_i$ on certain height $h_i$ has been transferred to inversion energy $|mg \int t g \theta_i \cdot d \theta_i| \downarrow \downarrow$ due to environmental impacts. Following the definition of inversion energy, any part of a non-rigid object can establish persistent fluctuation against gravity will accumulate inversion energy, the reason for rigid bodies' common energy conservation $mg h_i = \frac{1}{2}m V_i^2$ is due to the item $|mg \int t g \theta_i \cdot d \theta_i| \downarrow \downarrow$ always equals zero or no part of a falling object can establish a persistently shifting angle $\theta$ against gravity. This reveals for free-fall liquid bottles or other non-rigid objects, their common energy conservation equations have been impacted by the item $|mg \int t g \theta_i \cdot d \theta_i| \downarrow \downarrow$ to a certain degree. Such impact can shift the acceleration or falling path for non-rigid objects, the acceleration $a$ is no longer a constant $g$ and always shifting with certain strengthening and weakening effects (this is a macrocosmic gravitational quantizing effect induced by internal fluctuation which exists for all non-rigid objects, just for bottled liquids that can easily observe we then used them for experiments), sometimes even the free-falling path can demonstrate certain bio quantum or cylindrical spiral paths. (From here, the natural quantization of gravity is challenging if we restrict to rigid bodies, once allow non-rigid bodies, it becomes easy. Such a quantization originates from the trigonometric correlations among different fluctuations inside the non-rigid bodies)

Quantization effect and inversion happen inseparably thus issuing surface memory effects, at each height $h_i$:

$$mgh_n = \frac{1}{2}m V_n^2 - |mg \int t g \theta_n \cdot d \theta_n| \downarrow \downarrow$$
\[ \begin{align*}
mg h_{n-1} &= \frac{1}{2} m V_{n-1}^2 - |mg \int t g \theta_{n-1} \cdot d \theta_{n-1}| \ll \\
\cdots \\
mg h_0 &= \frac{1}{2} m V_0^2 - |mg \int t g \theta_0 \cdot d \theta_0| \ll
\end{align*} \]

At \( h_n \) the inversion energy is \( |mg \int t g \theta_n \cdot d \theta_n| \); at \( h_{n-1} \) the item \( |mg \int t g \theta_{n-1} \cdot d \theta_{n-1}| \) can't fully transfer from \( \Delta h_{n-1} = h_n - h_{n-1} \) and the transferring efficiency decides by the system trigonometric curve repetitiveness at \( h_n \), at \( h_{n-2} \) it is still decided by the trigonometric curve repetitiveness at \( h_{n-1} \), and so on, which is an inversion superposition process and for each stage the efficiency is decided by available trigonometric curves from the previous stages (the non-transferrable parts back to \( \frac{1}{2} m V_i^2 \) or the environment). These are standard physical inversion energy "procure and equivalent" or "memory" processes albeit the percentage of inversion energy is only a small fraction. (For free-fall bottles with liquid, around 7.04m height get FHD 21.75cm, it is estimated that the inversion energy transfer rate is: 21.75/704 \( \approx 3\% \) in the video\(^3\). This percentage is possibly what a single layer of liquid surface tension region object generally can transfer, and the efficiency includes a certain memory effect.)

Evolution to bio-systems, the memory mechanism is still the same just inversion energy \( |mg \int t g \theta \cdot d \theta| \ll \) extending from a single layer to multi-folded layers of surface tension regions, then fully following inversion energy conservation instead of common energy conservation. For free-fall non-rigid objects, inversion energies collected at height \( h \), etc., are equivalent to bio-systems only taking the inversion energy induced by parameters instead of parameters themselves in each step. Besides the inversion energy percentage difference, non-living bottle liquid inversion energy accumulations at \( h_n \) till \( h_0 \) only hold a faint ephemeral quantum effect. For a bioprocess involving \( n \) steps of procurements, each step procurements as \( E_i \) to \( E_n \), this \( E_i \) to \( E_n \) gradient will be quite stable and the quantization effect will be persistent; such a persistent quantization effect still come from this stage's \( E_i \) to \( E_n \) is strengthened by the trigonometric curves from previous stage's \( E'_i \) to \( E'_n \) or universal memory equivalent effects, such memory equivalent effect is strengthened along a phylogenetic tree. Later we'll see that membrane selective permeability and cross-folded surface tension region flows are such kinds of memory equivalent mechanisms. (For the bio-system equation in (Fig.1a), \( mgh_i = \frac{1}{2} m V_i^2 - mg \left| \frac{12}{2^{n-1}} \right| \), the earlier item \( |\int t g \theta_i \cdot d \theta_i| \) is to integrate all the parameter fluctuation-induced gravitational inversion energy, the new format \( mg \left| \frac{12}{2^{n-1}} \right| \) means the memorized inversion energy and the newly procured inversion energy can be "equivalent" by certain \( \left| \frac{12}{2^{n-1}} \right| \) combinations, it's a useful tool for high repetitiveness conditions. The bio-system free-fall
equation in the figure is an uncontrolled condition in which gravitational energy has overflowed the system's transferring capability thus \( \frac{1}{2} m V_i^2 \) present, all biological processes are controlled processes, which means all the kinetic energy \( \frac{1}{2} m V_i^2 \) can be transferred by surface tension regions to potential types \( mgh_i \), thus \( mgh_i = -mg|^{\sqrt{2^{n-1}}}_n \) or \( h_i = -|^{\sqrt{2^{n-1}}}_n \), which is the third law modification\(^3\). The item \( m g |^{\sqrt{2^{n-1}}}_n \) is the gravitational law for living bio-systems. The Newtonian gravitational constant \( G \) only works for rigid bodies, bio-systems shift \( G \) by \( |^{\sqrt{2^{n-1}}}_n \) combinations via multi-folded surface tension regions, and Cavendish mutation experiments get \( 10^9 \) levels of \( G \) shifting\(^3\). The gravitational enlargement of bio-systems over rigid bodies comes from the “equivalent” of previous memorized inversion energy with the newly procured inversion energy, the more internal fluctuations among these two sets of inversion energies of a surface tension system, the more gravitational binding, which means memory possesses “weight”. This “weight” is different from conventional mass-induced “weight” thus challenges various mass-based rigid equations.

For bio-systems, the above capability of quantizing equivalent procured inversion energy with memorized trigonometric curve repetitiveness by inversion superposition is defined as bio-inertia. Newtonian inertia is for objects to keep their motion or common energy state, and bio-inertia is for topological spaces to keep their inversion energy memorized state. Newtonian inertia resists motion state change by mass (or stress-energy tensor), and bio-inertia resists internal universal memory (or trigonometric curve repetitiveness) state change by procuring more gravitational inversion energy from the environment, both are resistance then referred to as “inertia”. The restriction of inversion process in the Newtonian rigid reference system established the foundation of modern science; however, it is the bypassed physical properties (trigonometric curve repetitiveness memory) that originated life and drive evolution (We should realize that Newtonian inertia is a special rigid condition of bio-inertia. If the previous energy state and newly procured energy state inside an object can theoretically be completely described by rigid time and without any memory effect, that is rigid inertia. Any percentage of inversion superposition process or memory inside it means an increased percentage of bio-inertia, once the trigonometric equivalent memory extends from a single layer of surface tension region to folded multi-surface tension regions, it is then evolved into a living system). If we use an elastic reference system to study genes, the fluctuations from coded and non-coded segments equally contribute to system “repetitiveness” memory, no matter which amino acids are coded. We must carefully note that it is system repetitiveness that offers genes in vivo functioning, never gene can offer memory. CRISP/CAS9 is usually explained as an immune system of prokaryotes;
however, it is also such a fluctuating memory system. The mechanism is only nucleotide fluctuation instead of the coded peptide. Diverse epigenetic modifications come from such fluctuations; the folding dynamics of a protein and bio-system innate immunities are also based on fluctuations for all acquired immunities. Stem cells are only those with a higher repetitiveness memory compared to a group of common cells, germ cells are the highest.

2. Establish inversion energy/quantizing time to grow over the “super-simultaneousness” hidden in conventional quantum mechanics for bio-systems growth turnover selection inheritance

The second law of thermodynamics describes certain non-living systems that are relatively easy to equilibrium with external environments, attaining the equilibrium state means reaching an entropy maximum state or a minimized internal inversion correlation state among system parameters. From here, inversion energy fluctuation is to make bio-systems stay in a state that is far from thermodynamic equilibrium states to maintain enough internal inversion turnover correlations. We call such a condition an entropy-controlled state, which means synchronizing the entropy generation of each part by inversion superposition (E.g. wound healing is a kind of physical entropy synchronizing process. As in the previous example, system parameters $x_1$ to $x_k$, with their repetitive numbers as $n_1$ to $n_k$ in the group, wound means the parameter $x_i$ is damaged and its repetitive number $n_i$ deviates from the previous $n_1$ to $n_k$ pattern, then other repetitive numbers $n_1$ to $n_k$ can make the $n_i$ back to a “compromised previous pattern” by costing their own inversion energy, the driving dynamics to recover $n_i$ is a universal memory. An entropy-controlled state is a kind of system repetitiveness memory state, and the thermodynamic equilibrium state means the repetitiveness of system parameters reduces to a lower threshold and thus can’t maintain the memorized internal pattern for life. The Second Law of thermodynamics is incomplete since it misses trigonometric gravitational effects, no isolated system on Earth can fully shut off the effects thus inside the so-called isolated system bio-evolution will still happen. Schrödinger initiated the negentropy concept however failed to find it from the trigonometric curves abundant in his equation. Bio-systems fully rely on trigonometric negentropy to synchronize different locations of in vivo entropy for survival). Due to inversion energy being quantized energy (with a non-zero interval, zero interval means dead), the structures that make the inversion energy remain in an entropy-controlled state are also quantized, define as quantizing time.

The human memory we usually see is the advanced part of quantizing time or the universal memory. Different from common sense, repetitiveness memory is based on the spinal cord instead of the brain. For lower-evolved species, it is based on palindromes or CRISP/CAS 9 instead of coded genes. (Spinal memory is innate and universal,
while brain memory is only acquired and specific. The former is over 90% of the system controls for any species including humans. This is the reason why brain consciousness can’t control somatic organs to prevent cancer.)

Conventional quantum mechanics doesn’t differ between inversion energy and common energy primarily because its wave function never considers gravity. And it has only quantized energy \( E = n h \nu \) and hasn’t quantized time thus inducing quantum collapse. Wave function collapse means the integer structure of a gradient (here a quantum state is modified into a gradient since “\( \mathbf{i} \)” implies symmetric which is not present for bio-systems) instantly disappears. It hides that no matter how many gradients are superposed into a wave function, once one gradient \( \phi_k \) collapses to its eigenvalue \( a_k \), all the other superposed component gradients will “simultaneously” collapse to their eigenvalues (only such “super-simultaneousness” can make the process undetectable). In Schrödinger equation:

\[
\frac{i \hbar}{\partial t} \psi(r, t) = -\frac{\hbar^2}{2\mu} \nabla^2 \psi(r, t) + V(r) \psi(r, t)
\]

wave function \( \psi(\mathbf{r}, t) \) uses position \( \mathbf{r} \) and time \( t \) to describe the motion of a particle. The quantized energy composes of minimum non-zero packets; if time is quantized, then it will also compose of tiny non-zero units, which means the quantum collapse process can’t happen undetectably (at least time quantized interval can be observed).

As mentioned, studies of evolution should start from properties before life existed; therefore, physics will be closer to this target than chemistry. Even within the physical discipline, not all parameters serve the purpose. The inversion energy/quantizing time model is to recover the bypassed properties of common non-quantized energy/time models since Newtonian times. (Fig. 1b) shows a more general bio quantum path elastic string model. As in the figure, for an ideal string, the oscillation length/frequency relationships follow the same pattern no matter moves upstream (more strings connected) or downstream (hedge a string to a certain section):

\[
\text{Wavelength} = \frac{2L}{n}, \text{frequency} = nf_0.
\]

In real conditions, due to the non-isolated environment or diverse reasons, a bio quantum path only can effectively utilize the length/frequency ratio to resist environment drifting in a certain range. E.g. upstream 5 lines and downstream 6 lines fall into system acceptable accuracy, which can define as the life range of a string. For the topological property equation, within the life range, all the strings fall into a certain trigonometric curve pattern based on the modification of Newtonian first law:\(^3\). The Newtonian first law states that an object either remains at rest or continues to move at a constant velocity unless it is acted upon by an external force. It does miss the condition that an object is only impacted by a large gravity field, or on earth, all the other forces can always net to zero and only left pure earth gravity. Under such a condition, the object will remain in the state of certain bio quantum path(s). People see an object standing there and misunderstand that net to zero
forces stops it from moving along a straight line; however, the real reason is net to zero forces stop it from moving along a certain bio quantum path. Newton’s neglection misled most people including Einstein, Schrödinger, and Darwin. The origin of life did happen in a net non-gravitational force state that was neglected by Newton. The yolk sac blood islands as the first site of hematopoiesis we can observe today is an example. These cells net the non-gravitational impacts into zero and then active bio quantum paths by high surface tensions, the primitive hematopoietic cells begin to accumulate inversion energy and later develop into heartbeats. Also, all in vivo environments on Earth are based on such “net to zero” bio quantum path states. (“Net to zero straight line” hides while one force is added on a net state object, we can individually calculate the rigid inertia state change by equations. “Net to zero bio quantum path” means the elastic inertia state changing factor can’t come from an individual bio quantum path since it correlates with all others with the same bio quantum path pattern).

Technologically, for the horizontal experiment in (Fig. 1a), we construct the rigid bio quantum path into a symmetric cosine curve; however, the non-gravitational environmental impacts will be an unsymmetric parameter pattern composed of an ascent and a descent part as in the top of (Fig. 1c). And gravitational binding will tend to pull back such an unsymmetric shifting (more repetitiveness, more pull back potential). Following the modification of Newtonian second law, anything getting the same bio quantum path pattern then can issue impact, then the pullback inversion energy for combating external impacts can come from different sources as in the bottom of (Fig. 1c), we generally call those from the same string as inversion energy and those from different strings as quantizing time albeit they usually entangle each other (inversion energy takes differential equations \( \frac{d}{dx} \cos x = -\sin x, \frac{d}{dx} \sin x = \cos x \) and quantizing time takes integration equations \( \int \cos (nx) \cdot dx = \frac{1}{n} \sin(nx), \int \sin (nx) \cdot dx = -\frac{1}{n} \cos (nx) \) thus induce integer \( n \)). The shifting tendency between the symmetric VS unsymmetric pattern reflects the conjugation of gravitational VS non-gravitational impacts to shape a bio quantum path pattern. In a life range as in (Fig. 1b), each line composes of an event, which means the effective string utilizes different tension to respond to the external environment, written down by Chu’s constant as \(|\sqrt{\frac{1}{2^n}}\), n=1 means event 1 till n=k, event K (or equivalently use \( \cos (nx) \) or \( \sin (nx) \), just the latter lack index 12). For inversion energy \(|\sqrt{\frac{1}{2^n}}\), due to environmental impacts, it will dampen partial or full levels; the quantizing time of it is the inversion superposition of events \(|\sqrt{\frac{1}{2^n}}\) in an inversion manner to recover the impacted levels or trigonometric pattern(s) (common rigid time is for “simultaneity” against a third-party reference, a rigid time \( t \) means the distance to a certain theoretically accepted “simultaneous” time point. The quiddity of quantizing time is the “non-simultaneity” of a group of parameter fluctuations that still maintain the least group parameter properties. In the horizontal
experiment of (Fig.1a), path B is constructed into a cosine curve, conventional physics writes the motion into \( x = A \cos \omega t \), which means each particle on the curve uses the same simultaneous time \( t \). The maintenance of the rigid \( t \) for that equation relies on isolated conditions. Once in a non-isolated environment, we can easily observe time advance in just a three-period as in (Suppl. Movie 1), which means these three periods have accumulated observable elastic non-simultaneous time from that environment. A curve can keep its trigonometric property in a certain non-zero range in a non-isolated environment, such a range can be expressed as non-simultaneous quantizing time. It represents the elasticity of the curve in that environment and the only place to store and issue it is still elastic bio-quantum paths, bio-system inversion energy must rely on such non-simultaneous time for functioning. In the horizontal experiment of (Fig.1a), we can only see one row of inversion energy, once the first row of inversion energy can accumulate new fluctuation and continue to establish \( n \) rows based on the original path B, such as in a living bio-system, we can then use combinations from \( |\sqrt{2}^{n-1}\rangle \) or \( \cos (nx)/\sin (nx) \) to modulate the quantizing time internal pattern for them. For a living structure, the more “non-simultaneousness” stored in a correlated surface tension region and non-surface tension region, the more life inversion energy elasticity of the structure, simultaneously only happens in a dead state.)

(Fig. 1d) demonstrates the inversion energy (or repetitiveness memory) gravitational growth and survival mechanism (all life ranges in (Fig.1b) are growing from this mechanism). Given inversion energy \( \cos x \) (\( \sin x \) is the same then omit) in a non-isolated environment with ground stability \( |\cos x\rangle \) and parameter fluctuation \( L \). In a favorable environment, once establishes new parameter-against-gravity-fluctuation based on the original \( L \), fluctuation \( L \) will gradually accumulate new fluctuation \( 2L, 3L \), etc., the stability of \( |\cos x\rangle \) is then strengthened by \( |\cos \frac{1}{2} x\rangle, |\cos \frac{1}{3} x\rangle \), etc., to store more non-simultaneousness, which is the growth of a bio quantum. If the environment is not favorable, then it could collapse to \( |\frac{1}{2} L\rangle, |\frac{1}{3} L\rangle \), with stability as \( |\cos 2x\rangle, |\cos 3x\rangle \), etc., which is the survival condition. As in the figure, the stability of \( n=3 \) growing state is \( |\cos x\rangle + |\cos \frac{1}{2} x\rangle + |\cos \frac{1}{3} x\rangle \) and the survival state is \( |\cos x\rangle + |\cos 2x\rangle + |\cos 3x\rangle \), or \( \sum_n |\cos(\frac{1}{n} x)\rangle \) as growing states and \( \sum_n |\cos(nx)\rangle \) as survival states, or equivalently expressed as \( |n\sqrt{2}^{n-1}\rangle \). (The waves or oscillations in conventional physics are composed of theoretical particles with zero sizes, people only consider the holistic geometry of the equations such as \( y = A \cos x \) and never consider the size of an internal particle on the wave. A thick-wire string and a thin string are believed to issue the same energy if their wave parameters are the same. These theoretical waves can always be superposed without inversion. If we use a rod to stir water, there will be unexceptionally some waves along the
rod direction and some in reversed direction. The non-zero internal size is the causality of inversion, which can be called the internal size effect of the rod. In the real world, due to such internal size effects, all wave superposition can’t get a theoretical curve composed of zero-size particles, which inevitably includes both waves’ superposition and conjugated structures’ superposition. If the wave superposition parts can become bio quantum paths, then the conjugated parts will become peripheral biostructures. The growth format of $\sum_n |\cos\left(\frac{1}{n}x\right)\rangle$ or $\sum_n |\cos(nx)\rangle$ conjugated with peripheral structures is such a special “non-simultaneous dual superposition” bio structure that adapts to all species. The purpose of the conjugation is to release the internal particle size effects and allow non-zero size particle curve superposition, symbol “$|$ $\ldots$ $\rangle$” is to indicate coexisting structures that can’t be simply calculated as ideal particles and only can be expressed as certain inversion processes.) From here, the growth bundle $L_n$ is only a general type of “non-zero internal size wave superposition” structure, and no matter whether the superposed bundle $L_n$ is bent, stretched, compressed, growing, or in any system-accepted motion states, each component bio quantum path $L_1$ to $L_k$ keep the elasticity or integer ratio follows the topological equation and demonstrate shifting optimum length to the outside environment. For an ideal non-living single string, the equation $F = -kx$ is non-quantized, now the gravitational growth string $\sum_n |\cos\left(\frac{1}{n}x\right)\rangle$ can recover all system parameters by their non-simultaneous quantized patterns. Environmental adaptability relies on all the integers $n_k$ and cancer is the senescence of $n_k$ (Any life range in (Fig.1b) must be survived by internal fluctuation trigonometric turnover, which is internal shifting between upper and lower limits driven by conjugated structures to procure outside inversion energy. As $\widehat{H} = \widehat{T} + \widehat{V}$, the conventional wave function has been restricted by $\widehat{T} + \widehat{V}$ thus no growth or memory. In bio-systems, the Hamiltonian of growth bundle $L_n$ can be written as $\widehat{L} = \widehat{V} + \sum_n |\cos\left(\frac{1}{n}x\right)\rangle$, here, $\widehat{T}$ has integrated into $\widehat{V}$ by surface tension regions and only left $\widehat{V}$, the item $\sum_n |\cos\left(\frac{1}{n}x\right)\rangle$ is growth inversion energy from outside (or equivalent format: $\widehat{H}\psi = E\psi + \sum_n |\cos\left(\frac{1}{n}x\right)\rangle$). The integration of outside gravitational inversion energy items needs the turnover of all event levels of a life range. It’s only an inversion energy procuring manner, without such a turnover, the life range can’t procure inversion energy and will gradually wither. From here we can also find the difference between the conventional quantum and bio quantum, there is no need for the former to be maintained by gravitational turnover or growth and the latter must live (or grow) on such turnover. And due to no need for gravity, the former can superpose in a Schrödinger cat’s manner, and the latter is just conditional growth. Two quantum states can no longer be unrestricted superposable, the randomness background of quantum mechanics has yielded to a bio-system memory background. In the figure,
different colors are used for even and odd numbers of $\sum_n |\cos(\frac{1}{n}x)\rangle$ to roughly indicate inversion superposition.

In the growth process, the bio quantum inversion energy repetitiveness must persistently process environmental parameters into trigonometric curves to equivalent memory and can’t be present in an isolated condition used by conventional quantum mechanics. From here, bio quantum effect or in vivo environment can be further defined as the effect induced by gravitational growth of $\sum_n |\cos(\frac{1}{n}x)\rangle$ over ground state $|\cos x\rangle$), always composed of a bio quantum path growth bundle $L_n$ entropy-control structure (dotted waves in the figure) and peripheral conjugations to release the internal non-zero size effect, no matter which species or structures. (a common wave $\cos x$ is easily impacted by the environment, after ground stability can grow out $\sum_n |\cos(\frac{1}{n}x)\rangle$, the ground wave $|\cos x\rangle$ can be “shielded” longer due to environmental impacts rarely attain it. The mechanism of $\sum_n |\cos(\frac{1}{n}x)\rangle$ protection is by synchronizing diverse levels of entropy generations, given an environmental impact damages one period of $\sum_n |\cos(\frac{1}{k}x)\rangle$, then it will vertically reach $\sum_n |\cos(\frac{1}{k-1}x)\rangle$; however, damaged $\sum_n |\cos(\frac{1}{k}x)\rangle$ can be synchronized by other horizontal periods of $\sum_n |\cos(\frac{1}{k}x)\rangle$ thus preventing the damage from vertically reaching $\sum_n |\cos(\frac{1}{k-1}x)\rangle$, which is the mechanism of in vivo entropy-control protection. The basis of such trigonometric protection is still the “non-simultaneous collapse”, the system sacrifices $\sum_n |\cos(\frac{1}{n}x)\rangle$ to protect $\sum_n |\cos(\frac{1}{k-1}x)\rangle$ etc., and later can be pulled back by foods or other parameters (different signals such as foods, migration, chemicals, etc., only entangle to a certain k range for recovery, finally, all the impacts $n_k, n_{k-1}$ etc., will synchronize into the whole $L_n$ for trigonometric entropy-control thus inducing the growth or survival shifting of $L_n$.) Such a memory-based mechanism is not only for entropy protection but also for issuing functions. As the somite entropy-control examples in (Fig.1d), a centipede has $n$ somite each grafts a pair of feet, one pair $n_i$ running induces its entropy increase, then $n_1$ to $n_k$ somite synchronize the entropy to arrange the pattern of other feet’s running. Inversion energy is a non-simultaneous type that is used by the non-simultaneous time patterns of a system, thus can synchronize so many feet (Note, more than 90% of the feet’s motion come from the somite and only a small percentage of the control comes from the brain. Since the memory background of the spinal cord is the whole environment and that of the brain is only the spinal cord). Now the somite is the memorized trigonometric curves, all the system-sensitive parameters such as foods, temperature, chemicals, and feet migration, etc., are equivalent to somite memory as bio-inertia to structure the life activities. For humans, the
mechanism for somite entropy control is the same and only increases complexity. Not just somite, all structures start from the genomic gene mRNA splicing till spinal controlling follow the same growth mechanisms.

There are profound evolutionary elastic negentropy procuring sequences inside the growth and survival mechanism. Growth can be observed to reverse thermodynamic entropy generation to increase system complexity from genomic to somatic levels. "Reverse" is by utilizing non-simultaneous "elastic entropy generation" to replace common "rigid entropy generation" thus can utilize gravitational pull-back elasticity to acquire negentropy from the environment. As in growth $\sum_n | \cos \left( \frac{1}{n} x \right) \rangle$, suppose $L_j, L_k, L_l, \ldots$ are integer ranges in $L_n$ for procuring negentropy by foods, migrations, and shelters, etc. The ground states of $L_j, L_k, L_l, \ldots$ are based on the topological equation, then: $L_j/L_n = L_k/L_n = L_l/L_n$. While the entropy generations of $L_j, L_k, L_l, \ldots$ deviate from the holistic entropy generation, $L_n$ will pull back $L_j, L_k, L_l, \ldots$ to the ground states, and in the process of $L_j, L_k, L_l, \ldots$ being pulled back, part of the environmental inversion energy will bring by $L_j, L_k, L_l, \ldots$ to $L_n$ and integrated, those from the environment and integrated by $L_n$ are procured negentropy. The environment here only means outside the trigonometric growth bundle, different genes, proteins, cells, tissues, etc., use the same way to transfer negentropy among them. (These ground states are different from the eigenstates in conventional quantum mechanics. Bio quantum growth needs continuous "non-simultaneous collapse" to these alive ground states for procuring negentropy. Conventional quantum eigenstates are only for the "super-simultaneous" probability of measurements to "collapse" to dead states. The dead eigenstates can be any entity thus stability is zero. The alive ground states of bio quantum are quite stable as our lifespan.) Ground states can be written as:

$$\frac{L_j}{L_n} = \frac{\sum_j | \cos \left( \frac{1}{j} x \right) \rangle}{\sum_n | \cos \left( \frac{1}{n} x \right) \rangle} = \frac{L_k}{L_n} = \frac{\sum_k | \cos \left( \frac{1}{k} x \right) \rangle}{\sum_n | \cos \left( \frac{1}{n} x \right) \rangle} = \frac{L_l}{L_n} = \frac{\sum_l | \cos \left( \frac{1}{l} x \right) \rangle}{\sum_n | \cos \left( \frac{1}{n} x \right) \rangle}$$

For the ground states $L_j/L_n, L_k/L_n, L_l/L_n$, each negentropy pullback is first stored in the outsider layer $L_{n-j}, L_{n-k}, L_{n-l}$, then the trigonometric part can go further, and the non-trigonometric part will be excreted; finally, the acquired negentropy from each layer needs to be synchronized to all layers; therefore, the negentropy $L_j, L_k, L_l, \ldots$ that can be procured from the non-simultaneous quantizing time in $L_n$ is quite limited. Even such limited elastic pull-back negentropy is assumed on the full availability of foods, migrations, shelters, etc., once the environmental parameter availability changes, the system can adapt $L_n$. In a food abundant environment $L_j$ locates on the outside of growth $\sum_n | \cos \left( \frac{1}{n} x \right) \rangle$, while food availability decreases, $L_k$ or $L_l$ will shift to the outer layer to replace $L_j$ by inversion superposition (such layer shifting adaptability mainly happens in a sleep state
since each shifting must synchronize all growth layers to exclude non-trigonometric curves, such a synchronization relies on the minimum fluctuations of all layers then fall in a sleep state. Daytime rest can only partially shift that far beyond touches with all layers. In old age, sleep time will be reduced substantially since the layer-shifting capability is dampened. A sleep state is wakened up due to the layer-shifting being externally interrupted, which is like when old people's CSF layer can’t further shift then internally wakened. The trend of adaptability is always the good available negentropy sources tend to the outside layer of the growth bundle to fold into new surface tension regions and establish new bio quantum gradient structures (human training or learning is such “repetitiveness” layer-shifting that happens on the spinal structures to strengthen the pattern of attached peripheral body structures, certain signal layers get persistent stimuli then move to the out-layer and fixed to a new quantum length; therefore, need long-term stimuli and many sleep days. If the stimuli are decreased, that layer could be overlapped by new negentropy layers and then forgotten. For plants, the only negentropy source is sunlight, following the above lay-shifting adaptability, photosynthetic inversion energy is shifting to the outside of the growing bundle and transfers along the bark; in an embryonic stage, the photosynthetic functions should be in deep layers for inheritance, later, shift to outside by environmental negentropy sources. For plants, full growth turnover only happens in root apical meristems, leaves, flowers, etc., not like animals happens in spinal cords; therefore, a sleep state only in these locations. Such differences have been reflected in mRNA splicing patterns, intron retention is the major manner in plants, whereas exon skipping is a high frequency pattern in humans). In a generation, the lifespan is not only restricted by the availability of negentropy resources but much more rely on the adaptability that adjusts the well-available resources to the outside layers of the growth bundle \( L_n \). Such layer-shifting adaptability not only comes from parental generation but also accumulated along the phylogenetic tree. (Evolution is the increasing internal fluctuation turnover \( n \) of the highest \( L_n \) by generations. Most species including human beings only can have a few out-layer negentropy resources for the largest growth bundle \( L_n \) to recover due to environmental restrictions. The prerequisite condition for these out-layer negentropy sequences to be inheritable is they can be reversed into germ cells and can also reverse back in developmental stages. Therefore, adaptability includes gravitational turnover repetitiveness memory from many generations. Various local gene mutations, such as food DNA segments or epigenetic modifications enter somatic cells, various bacteria or viral segments invading left, drug impacts, and even cancer mutations from self are not inheritable due to such physical turnover selection. It is also the highest genetic immunity). The \textit{in vivo} growth mechanism fits all species from genomic to somatic level and only differs in \( L \) and \( n \). Inheritable traits are unexceptionally those shifting by environmental negentropy sources to the out-layers of the growth bundle and then can inverse back to the
innermost of the germ cells to transfer to the next generation, and in embryo development these traits turnover to outside growth bundle again, we call it growth (negentropy procuring sequence acquired) turnover selection (memory) inheritance. Groups of correlated gene mRNA splicing processes still unexceptionally comply such growth turnover evolutionary mechanism, once exons are spliced, in vivo environment will grow certain patterns to the growth bundles, then good negentropy sources shift to the outside gravitational wave layers. After these out-layer exons can be inversed back into the inner layer, then can be transferred to the next generation. It is always higher turnover exon combinations being selected and the rest are sacrificed for the trigonometric curves of those selected. (Note: this growth turnover evolutionary model endorses Lamarckism and not Darwinism. Genetic mutations never randomly happen, must physically pass turnover selection from various directions at diverse levels to activate to the next generation. Lamarckism complies with later experiments such as mRNA splicing, CRISP/CAS 9, embryonic development dorsoventral inversion, etc., quite well than Darwinism. People insist on the latter to construct genetics only because of Newton's bypassing. From here, most of nowadays biological databases, models, and theories need substantial rework to recover the bypassed physical inheritance).

While calculating repetitiveness (turnover rounds) induced by events $|\sqrt{2^{n-1}}\rangle$, n=1 or n=k, including any combinations, are equally weighted as the same repetition. The modification Newtonian third Law says, “equivalent the quantizing time of Planck region and surface tension region”, is to make the n=1 or n=k events of these two regions fall into the same series of bio quantum path events, which is the fundamental capability of an in vivo environment. The “equivalent” means to grow the maximum non-simultaneous quantizing time storing state or between these two quantizing time sets then can hold maximum numbers of inversion growth levels. After equivalent, quantizing time can also be called “aether” for the topological space. For humans, we use Chu’s constant $|\sqrt{2^{n-1}}\rangle$ with index 12, whether other indexes can exist need further study after humans.

The inversion energy/quantizing time correlation is not presented abruptly even within conventional physics. There is a time and energy conjugation in conventional quantum mechanics: $\Delta E \Delta t \geq \frac{\hbar}{2}$, the $\Delta E \Delta t$ is similar but not the standard Heisenberg uncertainty formula since H and t are not dynamically conjugate variables. There are also a lot of other direct conjugate variables such as $[\hat{x}, \hat{p}] = i \hbar$, which means these two parameters can’t be measured simultaneously. Schrödinger equations are established from these conjugate variables, $i \hbar \frac{\partial}{\partial t} \psi(x) = \hat{H} \psi(x)$. These conjugate variables are hidden Newtonian bypassed inversion energy properties (two variables can’t be measured simultaneously does mean they can’t use rigid time, there is a certain inversion correlation
between these two variables that need to adapt to quantizing time), if we can grow Planck $h$ as $L$ in the topological equation, $\lambda$ as the events ($p = \frac{h}{\lambda}, p$ not conserved in biosystems), then can adapt to the macrocosmic inversion energy/quantizing time. The macrocosmic wave function is based on growth mechanisms (Fig. 1d) that originate from modified Newtonian laws (The growth equation, $\hat{H}\psi = E\psi + \sum_n |\cos(nx)|$, can be regarded as a macrocosmic format, just needs inversion energy/quantizing time relies on surface tension regions). This wave function includes full quantized inversion energy and quantizing time conjugations with elastic bio quantum length $L_n$ ranging from codon size to spinal scale, growable and inheritable. The macrocosmic wave function originated from the experiments in (Fig. 1a), till now we still haven’t found a significant difference between the simple harmonic oscillation basis of the microcosmic and macrocosmic wave function except on the gravitational growth mechanism. Item $\sum_n |\cos(nx)|$ can extend to describe the spiritual world. The limit of the conventional quantum effects observed is C60 molecule$, for the experiments in (Fig. 1a), with horizontal gravity quantization, even constructing a huge bio quantum path for a few kilometers, still can easily show gravitational quantum effects; with vertical gravity quantization, the macrocosmic gravitational "inversion grid" ($\hbar$ in the (Fig.1a), $g$ shifting grid) can easily be observed with bottled liquids. Microcosmic quantum never considers gravity and allows inside object interference (the quiddity is still the internal size effect of waves) thus relies on external judgments such as double-slit experiments. Once allows inside object body interference and takes internal judgment (memory), then that is life functions. Due to the gravitational basis, this macrocosmic wave function format is generally called in vivo gravitational waves which have been verified by experiments in (Fig.1a) and diverse FHD$^3$ (in vitro gravitational waves are believed to be relativistic and impact pass through rigid objects almost undetectably. It should impact high surface tension region objects greatly due to non-simultaneous quantizing time. Since in vivo gravitational waves are only effects of in vitro format’s persistent actions on surface tension regions of a system; therefore, only possess the rates of surface inversion and are non-relativistic).

3. Bypassed surface tension effects for conventional wave functions and the establishment of in vivo gravitational waves for quadrupole flow or selective permeability, physical role of sex in evolution

Conventional quantum mechanics originate from Planck’s Law published in 1900$^7$ can be written as:

$$I_\nu(v, T) = \frac{2h\nu^3}{c^2} \frac{1}{e^{\frac{h\nu}{kT}} - 1}$$
As in (Fig. 1e), it tends to the Rayleigh-Jeans law in the limit of low frequencies and tends to Wien approximation in the limit of high frequencies. The condition of this formula becomes the foundation of quantum mechanics, $E = nh\nu$. The experiments need a pinhole in a cavity with radiations entering from it to reflect on the inner surface for many rounds. Low frequencies mean fewer refraction rounds and higher frequencies mean more refraction rounds. From here, the Planck mathematical operation $E = nh\nu$ connects two formulas by increasing the surface reflection efficiency, and the quantum state still can’t be exempt from surface tension effects (more rounds of reflections) here. Another milestone experiment is the photoelectric effect proposed by Einstein. However, it has been re-explained by surface tension inversion\textsuperscript{2,3}. We still can use this mechanism to explain the single-slit and double-slit experiments. As in the left of (Fig. 1f), each slit composes of two layers of surface tension inversion units. While electron beams or lights pass, they will inverse and make the electron beam or lights bent at a series of angles (string life mechanism in (Fig. 1b)). It is these angles that induce the interference fringes. (Conventional quantum mechanics has taken double-slit experiments to explain a lot of phenomena including the wave-particle duality; however, never explains why a single slit still works and whether the so-called quantum eraser is still effective for a single slit.) For the slit surface tension inversion mechanism, we can also get evidence from the experiment on the right hand with multi slits, due to the different inversion angles from slit surfaces, the interference pattern is not linear; always the linear regions are enclosed or interweaved with the non-linear regions. The interference fringes come by various slit combinations, which prove the surface tension inversion and can also be well explained by the mechanisms from (Fig.1d). (We can roughly call the linear region “Planck region” and the non-linear region “surface tension region”. The repetitiveness of a quantum gradient originates from the conjugation of these two regions, and Planck’s mathematical deal is only conditional and never universal).

It is noted that in the slit surface inversion mechanism of interference experiments, the light bent angles will be much large than Einstein’s big mass light bent angle, possibly Einstein himself had already noticed that, since in the Bohr-Einstein debate on quantum test reality, Einstein proposed a recoiling double-slit experiment\textsuperscript{8} and later Einstein’s box. These two designs were quite likely to test why the bent angles after the slit(s) were larger than his gravitational lens. The motivation for Einstein’s debate with Bohr was true to test the bent angles. Even he finally published EPR paradox\textsuperscript{8} correlated to this motivation (Note: Einstein had correctly deciphered the hidden “super-simultaneous” of the discipline through the EPR paradox: the more separation of entangled quantum pair, the more additional “super-simultaneousness” required for maintaining the entangling state, quantum mechanics itself never gives out the boundary of this pheromone and modulates it as eternal, thus incomplete; just Einstein
was too focused on local realism to express that clearly in the debate). From the modification of Newtonian first and the second law, we can easily know that surface tension regions are a place that bio quantum paths can grow or sustain better than any other conditions. The light bent angle after slits is larger than those from Einstein’s lens only because of such surface tendency of gravitational binding. It is also due to this reason, that we can directly observe that gravitational binding tends to surface tension region in a liquid or in a bio-system; half a bottle of water and half a bottle of oil can show FHDS$^3$ is evidence; also, hours after an animal is killed, its organs’ surface cell migration still can be observed by fresh observation method$^2$ is bio-system evidence. We can see dewdrops rolling on a leaf is also the same reason, the surface of the dewdrop has more bio quantum paths to acquire gravitational binding inversion energy to maintain the surface tension. Even food digestion processes can’t escape such surface gravitational tendency, gut peristalsis drives the nutrients with more trigonometric curves to the gut wall (surface of chyme), then can be absorbed efficiently by inversion. The growth adaptability mechanism in (Fig.1d) which shifts the higher frequency negentropy source conjugations to the outside layers of $L_n$ is also the same kind of gravitational surface tendency, just these in vivo growth bundle surface tendency layer-shifting conjuncts with peripheral structures to release wave internal size effects. All these facts remind us why gravity can’t be modulated by rigid time. For any object with a surface tension region, due to the same Earth gravitational field getting different effects on the surface tension region and the non-surface tension region, we must use quantizing time. Quantum entanglement$^9$ is obvious such gravitational-based surface tension tending effect, two parts of a quantum conjugation, no matter how far away they are separated, once their tendencies toward a certain gravitational surface are the same, then can entangle under certain conditions. The mechanism is still the gravitational tendency to a surface to revive better trigonometrical curves. Till now, experiments based on Bell inequality have never demonstrated an entanglement to be independent of gravitational fields, also can’t prove that the spooky action can happen in a “super-simultaneousness” manner. If a “spooky action” does not happen in that manner as described, it still means a non-zero correlation of quantum entanglement with a certain surface tension region. (The growth equation $\hat{H}\psi = E\psi + \sum_n |cos(\frac{1}{n}x)\rangle$ still adapts to microcosmic conditions, from it we can know that the prerequisite condition for conventional quantum entanglement is no growth happening in the process. From here, we even can verify whether wave function correlates with gravity without going to the moon. Just set up a series of shifting quantum length $nL_k$ for entangled quantum pairs $a_k$, once the growth $\sum_n |cos(\frac{1}{n}x)\rangle$ is not zero, then wave function correlates with gravity, thus quantum mechanics is incomplete, and the hidden variable is gravity. Einstein can interpret the EPR paradox at a time when no one knows surface tension
effects since his field equation has already demonstrated some surface properties that agree with the gravitational surface tendency, just these surface properties are rigid geodesics without any inversion thus challenging to explain the FHDs of high surface tension objects. Einstein’s system seeks coordinate invariance for parameters, which means physical laws keep the same in all reference systems. However, transfer from one to another, such as between inertia/non-inertia frame, does need inversion, his system neglect such transferring intermediate stages. Bio-systems are only naive evolutionary existences composed of such reference-shifting intermediate states.)

Now, we can further the function of surface tension regions from the “super-simultaneousness” hidden in conventional quantum mechanics. As in (Fig. 2a), n=1, n=2, till n=k, etc., are quantum levels, according to Copenhagen’s probability explanation, there should be a certain location in each level where the presentation of a physical property is almost zero probability to sustain the highest probability locations. However, it also postulates $|\psi\rangle = a_1|\psi_1\rangle + a_2|\psi_2\rangle$ for quantum states to be unlimited superposable, or the above zero probability location will not impact by any later quantum superpositions, which means something needs to assure constructive interference instead of destructive interference, that is hidden “super-simultaneousness”. The more superposition rounds for a quantum state, the more “super-simultaneousness” is needed. As in the figure, each conventional quantum level composes of a knot and a “super-simultaneous line”. Such “super-simultaneousness line” means the time for physical property such as an election’s transition among each quantum level is zero. Schrödinger cat is a typical example, no matter how many physical properties are superposed inside the box, all can be collapsed by opening the box, and the time for opening the box (collapse to eigenstate) is zero or no multi-layer box is allowed. If the box has 5 layers, then the eigenstate will be shifted between the 1st till the 5th open, such shifting eigenstate will beyond the handling of that discipline. It is also such hidden “super-simultaneousness” that induces inevitable quantum collapse. For this reason, these conventional quantum levels can be called “super-simultaneous levels”. (As mentioned in (Fig.1d), the reason for the conjunction of the growth bundle $L_n$ with peripheral structures is to release waves with different internal particle sizes. This is a non-linear inversion superposition process. The linearity of the Schrödinger equation is only approximate after minimizing surface tension effects, even in a microcosmic world, such an approximation is conditional. The discipline can modulate a single element well but challenging to modulate a compound is example. For a small molecule as simple as CO$_2$, we can write the zero time transition levels in the carbon atom, oxygen atom, and overlapped layer as $L_c$, $L_o$, and $L_i$, now $L_c$, $L_o$ will fall into Planck regions and $L_i$ will fall into the surface tension regions as shown in (Fig. 1f), even $L_c$, $L_o$ still can’t be unified, different Planck length $h_c$, $h_o$ will be present for $L_c$, $L_o$, then the linearity of the Schrödinger
equation can't be maintained. We should realize that even for a non-living being microcosmic quantum state, Planck regions and surface tension regions need different Planck lengths $L_i$. Planck length does not concern with the materials involved but does differ between these two kinds of regions. Conventional quantum mechanics minimizes surface tension effects and then gives people the impression that only one rigid Planck length exists. Once a simple molecule is established, such Planck length difference between regions can no longer be neglected.)

Based on hidden "super-simultaneousness" (postulate one), conventional quantum levels are eternal if not collapse, and nothing is necessary to maintain these “eternal” physical properties under no collapse conditions. Different from these, bio quantum levels are neither eternal nor could collapse in a “super-simultaneousness” manner; they are only conditional levels that must rely on environmental parameters gravitationally processed inversion energy structured by quantizing time for maintenance even after evolving for billions of years.; therefore, they are called inversion levels which are equally composed of a knot and an inversion line for each level. As in the right bottom of (Fig. 2a) example, a spinal vertebra is equivalent to a knot and a disc is equivalent to an inversion line. Here, all the inversion lines unexceptionally need quantizing time from certain surface tension regions for maintenance. And in bio-systems, no matter from genomic to the somatic level all bio quantum levels do need surface tension regions for functioning. And all the surface tension regions always concern a series of bio quantum levels based on their growth or survival mechanism (In $\tilde{H}\psi = E\psi + \sum_n |\cos(\frac{1}{n}x)|$, the item $\sum_n |\cos(\frac{1}{n}x)|$ must rely on certain surface tension regions and the turnover process refer to all levels, albeit the weight of each level concerning could be different by events combinations. Turnover is the fundamental characteristic of a parameter inversion driving system which composes the basis for quantization). As in the left of (Fig.2a), there exist a lot more and more complex membrane proteins in bio-systems. All these evolutionary structures are to bring their elastic property to assure while in inversion, the inward and outward vectors can fall into certain discreet events such as $|\sqrt{2^{-1}}\rangle$, $|\sqrt{2^{-1}}\rangle$, etc., and these events are equivalent to bio quantum level events $|\sqrt{2^{-1}}\rangle$ inside the cell (the reason that the quantum levels in conventional system is independent of suppositions rounds is still due to the lack of surface tension correlations, and bio quantum number composed of combinations of events $|\sqrt{2^{-1}}\rangle$ does correlate with superposition rounds (modern biology likes to attribute the limitations of DNA replication to telomeres; however, that restriction should universally originate from bio quantum inversion levels. Some people even hope to modify telomeres to change the DNA copy rounds and then change lifespan, but they failed to realize that changing DNA copy rounds can only induce cancer, since all the subsequent levels such as proteins, cells, tissues, etc., are structured by the original telomeres, only artificially change the telomeres can’t
make these subsequent levels to follow the new "design" automatically.)} The quantizing time correlation between (folded) surface tension regions to Planck regions is bio quantum path duality. Physically, it originates from horizontal experiments in (Fig.1a), biologically, it originates from gravitational surface folding in geological times.

(Fig. 2b(1)) is an animal gut development map, no matter which kind of animal, the development of guts can be simplified as a surface tension topological folding. The left of (Fig. 2b(2)) shows an ellipsoid enclosed surface tension region, if surface tension inversion energy can be accumulated and elevated under certain conditions to a threshold, then it will make the surface concave like on the right hand. Finally, it will establish an ellipsoid sphere with a smooth tunnel that runs through like in (Fig. 2b(3)), one side is the mouth, and another side is the anus (it is noted that the only place that can bear this kind of surface tension structure in nature is a whirlpool; the yolk sac tube here is for acquiring the huge surface tension inversion energy requirements from parents to replace the natural environment for folding). The folding of a surface tension region will result in many conditions for outside surface tension (blue) and the inside surface tension (red), those who can get a quantized number of bio quantum paths periods (integer relationships on different surfaces) will be more stable and survive, then establish events of $|\sqrt{2^{n-1}}\rangle$ to $|\sqrt{2^{n+k-1}}\rangle$. (This integer pattern means the tension from the same earth's gravitational field between the two folded surfaces is minimized thus the inversion energy can be transferred freely. As mentioned in (Fig.1d), once certain events can get growth turnover then can survive and inherit.) Life evolution is a process of accumulating surface gravitational inversion energy, this procured inversion energy tends to surface tension regions, then the folding of surface tension to store more inversion energy becomes the critical step for evolution.

A human titin gene is reported to contain 363 exons\textsuperscript{10}, which means this gene and relevant surface tension regions have been folded for 363 rounds which still need turnover for input. (Fig.2b(4)) is a folded and later detached condition. (Fig. 2b(5)) is a standard duality model, all the biostructures such as DNA/RNA, proteins, etc., we can see today have already historically experienced a lot of folding. After folding, the surface tension regions and the Planck regions need to be physically equivalent or grow into the same topological equation length $L$ series, then can issue trigonometric gravitation binding. The “equivalent" here is to grow to the pattern in the right hand (Fig. 2b) for the tendency to combat environmental challenging (Conventional biology never clarifies what is biomaterials, it only chemically claims carbon origin organic materials, now we know only those with enough bio quantum path duality originating from surface tension folding are biomaterials. Even a codon-size DNA segment has experienced a huge number of folding in geological time. More folding of a DNA segment means while activated \textit{in vivo}, then can turn over among so many folded-surface tension regions for inversion transferring.)
(Fig. 2e①) shows early human embryogenesis. Before fertilization, both spermatogenesis (Fig. 2c) and oogenesis (Fig. 2d) need two-stage meiosis to get haploid cells. Conventional genetics only considers some chemical differences such as diploid or haploid, etc., and never believes that physical properties of the same chemical nucleotide sequence can impact genomic regulation critically. Even the concepts of diploid or haploid, mitosis, and meiosis have neglected the gravitational turnover mechanism inside. It is a growth process as in (Fig. 1d) between diploid and haploid instead of a simple double process that can miss diverse environmental splicing levels between these two states. (Fig. 2c) shows human spermatogenesis starts from spermatogonia on the surface layers of seminiferous tubules of the testis, through a series of changes get large numbers of mature sperm cells with mitochondria integrated into their middle pieces. These sperm cells via a long journey to the epididymis on the surface of the testicle and then go further, every step is to select those with a better turnover by gravitational surface tension tendency. Oogenesis in (Fig. 2d) shows an equivalent surface tendency; the ovum cycles in the surface layer and needs to release from the surface of the ovary and then go further. Every detail of these two processes unintentionally selects the candidates with the best tending toward surface capability. There are a lot of chemical factors claimed to impact the process11-13; however, the real selection of a successful candidate should be the one with the highest percentage of physical trigonometric curves which inversion superposed by mtDNA and nuDNA from the long journey. This is still the growth mechanism in (Fig. 1d), from nuDNA and mtDNA oscillation baseline bio quantum path $L$, gradually growing out more $n$ for $\sum_n |\cos(\frac{1}{n}x)|^2$ in the long journey to procure environmental quantizing time. The candidate with the best turnover between nuDNA and mtDNA will be selected. For the nuDNA and mtDNA memory-based equivalent in spermatozoa journey, we can get supportive evidence from the cell level mitocytosis14, since later adult cells still need to excrement old mitochondria to maintain more curves. Also, horizontal transfer of entire mitochondrial genomes among grafted cells has been observed15. All these processes reveal that DNA physical shapes play critical roles; all reproductive mechanisms are to select the non-simultaneous quantizing time high turnover candidates for the next step.

In (Fig.2e①), the day 1 fertilization gets a diploid zygote with a polar body, then cleavage and compaction (8-16 cells). The processes of karyokinesis (mitosis) and cytokinesis work together to result in cleavage. The cleavage/compact conjugation is for the growth mechanism in (Fig. 1d). Under the same zygote surface tension region, the cell number increase rapidly, proteins are almost not synthesized, and zygote volume remains the same. Then each hybrid DNA gets much surface tension inversion energy (16 cells mean each hybrid DNA in one cell can roughly get $16^\times$inversion energy since the total effective areas of cell membrane surfaces increased to this level,
DNAs are confined in each cell but the surface tension from all cells in the region can be shared), then the DNA from each parent can select vigorously to reach more trigonometric patterns (conventional genetics always believes that half of the DNA is from the father and half from the mother. Due to DNA in germ cells being highly compacted, unfolding all of them and making half from each parent is notoriously challenging. The feasible way is unfolding and fusion running together, also accompanied by vigorous DNA modifications. These modifications were never mechanized to concoct half of DNA from each parent but to keep better curved candidates; therefore, after this process, the trigonometric advantaged DNA reaches a quite different number of genes from each parent, possibly 80% from one parent and 20% from another parent, which is simply a gene growth turnover competition that compensates for unfulfilled inversion left from the sexual behavior. Stronger evidence could be observed from mRNA splicing in eukaryotes, we usually see matured mRNA products migrate to the cytoplasm for protein synthesis, now it's just the vigorously spliced RNAs remain inside the nucleus to modify DNA; similar to CRISP/CAS9 which utilizes cytoplasmic RNAs to modify DNA, never mechanized to assure invading DNA and host DNA each get 50% percentage, only to assure inversion energy level after modifications. Here, for the reproduction process, the DNA from each parent mutually functioned as invading DNA, impossible to reach each parent 50% story, must compete for the best trigonometric turnover genes for the next generation). Such a cleavage-induced parental gene polarity growth composes the evolutionary potential of the first reverse of the growth turnover selection. The next step is compact, it should be more parental genes proliferated cells move to the outside layer of the zygote, which is a natural process that higher trigonometric internal motion cells tend to the surface. It is reported that the mechanism of compaction in humans is unknown, and in mice involves the actomyosin cytoskeleton and the cell adhesion protein E-cadherin. However, it should be generally a physical surface tension control process. The same process in zebrafish needs 1000 cells, which means the surface tension inversion energy from 8-16 human cells is equivalent to 1000 zebrafish cells. A human genome has a higher percentage of palindromes, it is these palindromes plus some protein folding supply most of the surface tension requirements. After compaction, it will differentiate into the inner cells with the outside trophoblast layer. Then cavitation, Zona hatching, and implantation on the uterine epithelium. With implantation, the huge surface tension requirements can come from the mother. After implantation, the cell mass inside the trophoblast differentiation will develop into hypoblast and epiblast (inversion on the uterine epithelium). A bilaminar disc will establish in the middle of hypoblast and epiblast, on day 15 it will fold into the primitive streak, marking the start of gastrulation which will develop into three germ layers: ectoderm, mesoderm, and endoderm. The ectoderm gives
rise to epidermis, the nervous system, and the neural crest in vertebrates. The endoderm gives rise to the epithelium of the digestive system and respiratory system, and organs associated with the digestive system, such as the liver and pancreas. The mesoderm gives rise to many cell types such as muscle, bone, and connective tissue. In vertebrates, mesoderm derivatives include the notochord, the heart, blood and blood vessels, the cartilage of the ribs and vertebrae, and the dermis. All these developments are continuous folding from the above three germ layer events. The spinal cord plays a critical role in the development and later the growth turnover selection, 12 thoracic vertebrae come from the mesoderm, 5 lumbar vertebrae and 7 cervical vertebrae come from the endoderm, and the ectoderm. (Fig.2e②) shows the dorsoventral inversion which was first noted in 1822 by Geoffroy Saint-Hilaire and was heavily criticized, but later get molecular support[17]. It sustains the growth turnover selection that passes turnover memory from parents. Developmental germ layer sequence is the reverse of such memory thus should slightly be different in generations and individuals. It is such a “slight” difference that can be accumulated into evolution. It is never the random mutation story that misleads modern biology, random only means equal parameter procurements between living and non-living beings are the same thus no evolution).

Now we can back to (Fig.2b⑪) to see the spinal development. Nearby the gut, there is a spinal and brain cavity parallel to the gut cavity. In (Fig.2b⑩) we also draw a similar structure with green color, which is a folding cavity or folding-induced subordinate inversion. While the folding establishes, the blue and red surfaces will compose of events $|\sqrt{2^{n-1}}\rangle$ and $|\sqrt{2^{n-1+k}}\rangle$. The transferring of gravitational inversion energy will gradually be reduced with the increase of distance from the exchanging trigonometric curves. In a certain place, there will establish inversion energy which can minimize the impact of the inversion from these two events but also correlated with them. This is the folding-induced (least) subordinate inversion, or while it can be observed we then call it a folding-induced cavity. They are on the brink of two series of events’ common life range. In a non-isolated environment, such a subordinate least inversion is not present suddenly. Starting from the genomic level, such a folding cache has already begun to present. For two correlated genes, Gene1 and Gene 2, or groups of genes, when they function, could still issue such the folding-induced (least) subordinate inversion. No matter which kind of genes and how they are inversing or folding, their impacts on palindromes are quite small. Palindromes are generally 20-30% in lower evolved species and reach over 98% for humans, the more evolutionary advanced a species, the more folding of genes, which composed the genomic level inversion and folding-induced subordinate inversion. In the multi-cellular development stage, the term “cavity” becomes visible. As in (Fig. 2a), every step will issue a lot of cavities. The cavities in cleavage, compaction, differentiation,
cavitation, zona hatching, etc., are observable cavities. For the fertilization stage from diploid to haploid, parental genes competition vigorously will also produce cavities that can't be seen. A "cavity" means the impacts it suffered from its upstream origins are minimized. Like in day 5, the cavity between the trophoblast and the inner cell mass is expanded, which means more spaces less impacted by the activities of the trophoblast and the inner cell mass will leave for the next stage host, and new contents into this space will be impacted less by the former hosts such as trophoblast and the inner cell mass. The spinal and brain cavity in (Fig. 2b) is established in such a way. Every surface tension region folding was integrated inside CSF events $\sqrt{2^{n-1}}$, then these events take the least inversion to govern the whole body into the entropy-control state. From the genomic level genes to proteins, cytokines, cells, tissues, organs, etc., each level structure has bio quantum path duality which originates from the surface folding following the growth mechanism in (Fig. 1d). The duality in blood progenitors has been verified.

(Fig. 2f) shows how surface folding can establish a cross-folded surface tension region flow from “selective permeability”. All in vivo such blood vessels, lymphatic circulations, nerve impulses, etc., are established from folded surface tension regions and are “quantized quadrupole” liquid flows (hexapole present in branch region) that different from in vitro flows. Surface tension inversion units are quadrupole types composed of inward and outward vectors, also correlate the surface tension regions with two surface vectors (The quadrupole concept is widely present in conventional physics; however, never inversion, the surface tension inversion units are special vigorous inversion types of quadrupoles. The quadrupoles we refer to in this paper are those with enough inversion energy instead of non-inversion quadrupoles). There are two fundamental differences between the living and non-living flows on quadrupole characteristics: first, all bio-system flow quadrupole units are quantized and those for non-living beings are non-quantized quadrupoles, as in the figure, both the inward vector and one side use the events $\sqrt{2^{n-1}}$, and outward vector and another side use $\sqrt{2^{n-1}}$, which means they can only fall into discreet trigonometric values, never like the non-living liquid surface tension quadrupole vectors can fall into any values. Second, for in vitro liquids, the non-quantized inversion units only exist in the surface tension region and can't be present inside the liquid body. However, all in vivo flows compose of quantized quadrupole units on every folded surface tension region. (For this reason, an inversion process can only happen on the surface of an in vitro liquid; however, can happen in every folded surface tension region inside an in vivo flow, which means entropy-control states go inside the whole liquids). Such an in vivo flow property evolves from the membrane's "selective permeability" which also originated from the surface tension region folding. As in (Fig. 2f), we use green color to represent four folded surface tension regions, on these folded surface tension regions there are groups of
inversion units represented by A, B, C, and D, the advantaged inversion units from the quantizing time of A, B, C, and D groups can establish a cross folded-surface tension path under certain conditions. All cell membrane selective permeabilities are established in this way.) A cytoplasm is never a uniform gelatinous liquid, it contains a lot of surface tension folds to establish a selective permeability path albeit we generally can’t see. (We also call a cell membrane selective permeability path a “cross surface tension region flows without a sheath”.)

An in vivo flow upgrades from such a “selective permeability” while a visible sheath is evolved out. For CSF, as in the figure, we put a blue color sheath with layers of folded surface tension regions outside and quantized quadrupole units inside. The left and right hand of the flow are not symmetric (a human body is never absolutely symmetric for the left and right sides thus can store non-simultaneous quantizing time); therefore, fall into different events such as \( |\sqrt{2}n^{-1}\rangle \) Vs \( |\sqrt{2}n^{-2}\rangle, |\sqrt{2}n^{-3}\rangle \) Vs \( |\sqrt{2}n^{-4}\rangle, \ldots \), etc., correspond to the upward and downward vectors of the flow quadrupole units at that level. After evolving, the quantizing time mechanism is the same and the CSF flow still relies on the state of each folded surface tension it crosses for selective permeability. CSF is the highest gravitational binding flow, which means its inside flow inversion entropy-control capability is the highest among all body fluids and can transfer to the farthest terminals in the body. All in vivo flows follow the same mechanism and only differ in strength. As in the figure, suppose a flow has four folded surface tension regions marked as A, B, C, D. For an in vitro flow, the entropy control capability is quite lower; it is quite difficult for an ingredient or environment impact \( y_i \) that has just reached location A to simultaneously satisfy the requirements of location B, C, D. For an in vivo flow, suppose the flow contact folded A, B, C, D locations have fluctuation numbers as \( n_A, n_B, n_C, n_D \) from “last optimum pattern”; then while \( y_i \) reaches location A, it doesn’t matter this time’s impact \( y_i \) is same or different with “last optimum pattern” impact, once location A attains the fluctuation frequency \( n_A \) (different sources still can activate the same fluctuation frequency), even \( y_i \) doesn’t reach B,C,D, last time’s optimum \( n_A, n_B, n_C, n_D \) memory pattern has activated to these locations. With such memory which can be expressed as certain combinations of events \( |\sqrt{2}n^{-T}\rangle \), the difference between the inversion energy before and after \( y_i \) really reach the location B, C, D, will be minimized. (Bone fracture is a typical example, the peripheral tissues follow memory to minimize the difference between the fractured part and non-fractured bone to grow to heal. Here, the fractured bone part physically equivalent to the flow activates memory from other places but still does not reach the actual location). Also, after \( y_i \) reaches or passes B, C, D, the mutual activation of optimizing patterns for A,B,C,D still continues. This is the repetitiveness memory entropy synchronization that regulates all in vivo flows. The lasting of universal memory on any location depends on
available and potential trigonometric motions on-site. All the attached peripheral structures of the flow such as epithelium cells, nervous fiber, connective tissues, blood vessels, etc., are for this entropy-control purpose, which prevents individual entropy shifting by synchronizing \( n_A, n_B, n_C, n_D \) entropy generation. Other \emph{in vivo} flows are of the same mechanism, an intestine need to synchronize all the absorptions at the start, end, and each section then peristalsis; mRNA needs to synchronize each exon then splicing, a spine needs to synchronize impacts from the whole body then bend; etc., all such flows based on repetitiveness memory. For the growth mechanism in \textbf{(Fig.1d)}, the acquired growth \( | \cos \left( \frac{1}{n} \pi \right) \rangle \) supply basis for such synchronization. As mentioned, bio-systems only take parameter inversion instead of parameter data is also the same mechanism, suppose impacts \( y_k \) only stop at location A, which is common energy. If impacts \( y_k \) reach location A and can activate the memory pattern of correlated locations B, C, D for later recovery, then become inversion energy of these locations. In bio-systems, all common energies must be excluded and only leave inversion energy. (The gravitational “inversion girds” in vertical experiments in \textbf{(Fig. 1a)} are equivalent to the folded surface tension region here, folding increases the gravitational strength over non-living beings by \( 10^9 \) rigid G). We usually see different flows such as blood vessels, lymphatic flows, nervous system, etc., entangling and issuing branches due to their inferior cross folded-surface tension capabilities and need CSF to assist. As the ingredients \( x, y, z \) between surface events in \textbf{(Fig. 2f)}, will drive by the system plus their own gravitational tends to one of the surfaces and integrated, if fail to be removed as excrements. The removal of \( x, y, z \) that locate between different (folded) surface tension regions is still correlated by events \( | \sqrt{2^{n-1}} \rangle \) for entropy control. CSF contains all inferior flows for their surface tending capabilities.

The lifespan or the entropy-control potential of CSF for a person is based on the postnatal repetitive numbers or universal memory of the spinal events (the maximum spinal \( n \) can be grown as in \textbf{(Fig.1d)}). \textbf{(Suppl. Movie 2)} shows how the heart-lung-diaphragm inversion superposition on the spinal thoracic vertebra. We can see the internal fluctuation of the heart, lungs, and diaphragm transfer to the 12 thoracic vertebrae and composed of inversion repetitiveness. Here, only referring to three parameters, the repetitiveness comes from the inversion superposition of all spinal event’s internal fluctuation trigonometric curves no matter which source (from genes, proteins, cells, or environment) and which level (microcosmic to macrocosmic) they come from, the only standard is the trigonometric growth. From the genomic to protein level is the first growth pattern in which the next level only takes the inversion energy from the previous level. As in \textbf{(Fig.2g)}, suppose an mRNA will be spliced into \( k \) numbers of exons as events \( | \sqrt{2^{k-1}} \rangle \), then \( 2, \) till \( i \) numbers of exon combinations get events \( | \sqrt{2^{k-1-i}} \rangle \) till \( | \sqrt{2^{k-1-i}} \rangle \), combinations of these events compose of various splicing patterns based on \emph{in vivo} universal memory
and issue: $L_{\text{exon}} = \frac{2}{n} L_{mRNA}$, $f_{\text{exon}} = \frac{2}{n} f_{mRNA}$. Right now, only a few splicing patterns such as alternative, recursive, etc., have been reported. There are likely a lot of splicing patterns still not reported. The quiddity of mRNA splicing, or equivalent CRISP/CAS 9 processes follows the growth turnover selection inheritance mechanism in (Fig. 1d), which means splicing length $L$ will slightly be different among generations or even within one generation by age. Such $L$ shifting includes evolutionary memory from an already happened environment and which will be selected later. Protein folding still follows the same folded surface tension “selective permeability”. As in the right hand of (Fig.2g), we can find the least $\alpha$-helix and $\beta$-sheet since they are the elements of protein secondary structures, we can write: $L_{\alpha-\text{helix}} = \frac{2}{n} L_{\text{peptide}}, f_{\alpha-\text{helix}} = n f_{\text{peptide}}, L_{\beta-\text{sheet}} = \frac{2}{n} L_{\text{peptide}}, f_{\beta-\text{sheet}} = n f_{\text{peptide}},$ then use the same inversion superposition to get events $|\sqrt{2^{n-1}}\rangle$. Most inversion energy for protein folding should directly come from mRNA. Modern structural biology utilizes in vitro experiments to publish a lot of protein structures based on Anfinsen's dogma. In vitro conditions lack folded surface tension region quadrupole flow thus it is difficult to know the topological inversion dynamics of these acquired structures, no inversion means a limited understanding of functioning or dead structures. It is necessary to find gravitational turnover dynamics of them.

A gut is a visible cross-folded surface tension region flow with spinal CSF events $|\sqrt{2^{n-1}}\rangle$ as in vivo wave function or gravitational waves. As in (Fig. 2h), digested chyme flows from the gut means to cross the CSF extended folded surface tension regions, then increase the gravitational binding surface tension tendency or strengthen each CSF event and excrement the waste. CSF never takes the nutrients, only takes the inversion energy events $|\sqrt{2^{n-1}}\rangle$ induced by foods. Then these events transfer to other flows inside the body and compose a huge cross-surface tension region network to transfer inversion energy. Sexual behavior takes the same mechanism, never using the direct incoming data, only using the behavior-induced inversion energy; however, in a reverse direction: digestion transfers inversion energy to all flows of the body via CSF, and sexual behavior cost the inversion energy from these flows via CSF. CSF is the largest gravitational binding structure and runs in a different direction for males and females under normal daytime conditions (bisexual persons are different). Sexual behavior drives CSF to run in a different direction, then all the in vivo cross-surface tension flows and selective permeability reverse their inversion energies back to CSF for use in the process. While sleeping, the direction of CSF is still in a reverse direction to that in the daytime. However, such a CSF reverse direction running is for system entropy control, different cross-surface tension flows based on the topological equation to recover more trigonometric curves for daytime entropy generation activities, not the sexual behavior reverse that will lose a substantial amount of inversion energy that even can reflect in FHD$^3$ test one week after the behavior. As in (Fig.2i), sexual
behavior finally executes the growth turnover selection inheritance, male or female CSF integrates their advantage negentropy procuring sequences on spines, these sequences are reversed by the behavior to compact into germ cells to issue zygote, development reverse back the sequence to evolutionary turnover circle again. Sexual power means the in vivo stored gravitational capability to reverse the spinal negentropy procuring sequence into germ cells, developmental potential means the capability to gravitationally grow back the sequence inside embryos from environments. It is evolutionarily rational that the above genetically defined sexual power is the same as actual sexual capability in the real world. How many levels of orgasm of male and female partners in the behavior should be equivalent to how much spinal negentropy procuring sequences can be reversed into the zygote. The gravitational loss of over 28% FHD sexual inversions have been verified by animals, the loss is the physical cost for sexual turnover inversion and the mechanism adapted to all species. (Be carefully note what sexual behavior offered to the next generation is a memory that is far beyond nucleotide sequences. For lower-evolved species, these are possibly close. A bacterium even can intake DNA from the environment to replace the plasmid (2% genome) since the difference between those from the environment and those from the parental cell is so small or the lower sexual inversion memory of the species. With evolution, the more complexity of a species, the more difference between the memory and the DNA or the more sexual behavior power required from parents to reverse negentropy procuring sequences into germ cells. Suppose we can synthesize DNA with the same sequence as a human being, mutation can happen at any location, which means it is DNA. Once it gets the above gravitational turnover memory handled from parents, it then exponentially restricts environmentally impacted mutation locations to the memorized patterns, then it becomes (DNA carried) quantizing time or "repetitiveness" memory. Here the "repetitiveness" is from not just the last parental generation's turnover but also many remote ancestors. As the horizontal experiment in (Fig.1a), we have witnessed quantizing time growing on a bio quantum path. Evolution still relies on the same gravitational turnover growth to be alive and just extends to generation and species levels, the impotence of such a generation-to-generation turnover means extinction. Today, it is still unknown the detail of the turnover withering of dinosaurs. However, we can know for sure it is due to the impotence of the generation gravitational turnover. Unrealizing this fundamental mechanism, modern genetics even doesn't know how to resist the temptation of embryonic editing). Within one generation, the repetitiveness of spinal events |12√2n−1⟩ still can be physically trained postnatal to some degree. (Suppl. Movie 3) is one of the ancient spinal training methods (it needs to combine with other training since the growth bundle can’t separate from peripheral structures. Modern sports that originate from ancient Greece or Rome lack such spinal training. The non-prevailing of these ancient systems in modern society is only because all spinal training involves sexual
control techniques that modern people neither admit nor can endure the long-term physical abstinence training).

Conventional biology always claims that all bioprocesses are automatically happening. They never automatically happen; the only driving force is memory-based surface tension-tending gravitational inversion energy. In conventional physics, quantum means the minimum unit of physical property, a quantum state is a mathematical entity that provides a probability distribution for the outcomes of each possible rigid measurement on a system; however, there is only rigid superposition and no inversion superposition in the discipline thus no memory or growth capability. Bio quantum (paths) equivalently mean the minimum inversion unit of physical property in a non-isolated environment, a bio quantum state is a gravitational growth state over the “super-simultaneityness” basis from conventional quantum mechanics to reverse quantum collapse for lifespan. There is no significant difference between the two concepts of quantum except in inversion energy procure and equivalent memory duality and non-simultaneous elastic quantum growth turnover selection inheritance capability. CSF is the largest in vivo wave function or gravitational waves that need folded surface tension regions for proliferating and immunity, senescence is the in-generation turnover dampening and extinction is out-generation turnover withering. Our humans are growth turnover survivors from billions of years ago, and future species that transcend human beings are those who possess a substantially higher generation turnover adaptability than our species.

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Authors' contributions

L.Y.Y. perceived the models, performed all the experiments, and wrote the manuscript.

Declaration of Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.
Data Availability Statements

The datasets of the key reference paper are available in the ScienceDB, CSTR: 31253.11.sciencedb.02448, DOI: 10.57760/sciencedb.02448, entitled “Measuring human in vivo gravitational waves and the origin of an elastic reference memory”.

Supplementary information

Supplementary information is available in the online version of the paper.

Supplementary Movie 1. bio quantum path experiment that originates the modifications of Newtonian Three Laws of motion to bio-systems

Supplementary Movie 2. Inversion superposition of heart-lung-diaphragm on spinal thoracic vertebrae

Supplementary Movie 3. Ancient physical spinal training with over 1500 years of recorded history
Figure Caption

Figure 1 | Horizontal/vertical quantization of gravity defines memory equivalent bio-inertia, surface inversion mechanism of quantum interference, bio quantum growth turnover selection mechanism for biological inheritance

a) top: (macrocosmic) horizontal quantization of gravity by bio quantum path experiment for the definition of inversion energy, bottom: (macrocosmic) vertical quantization of gravity by falling bottled liquids and define of memory equivalent bio-inertia  

b) life range of a bio quantum path elastic model  
c) gravitational and non-gravitational impacts on a bio quantum path in a non-isolated environment, inversion energy/quantizing time  
d) bio-system inversion energy (repetitiveness memory) growth and survival mechanism, definition of bio quantum effects (or in vivo environment), growth turnover selection inheritance (This mechanism sustains Lamarckism instead of prevailing genetic Darwinism)  
e) Planck’s black body experiment can’t exempt a surface region, which means Planck’s mathematic operation is only conditional and not universal  
f) slit surface tension inversion mechanism of double-slit & multi-slit experiments. (This mechanism reveals that bio-systems utilize gravitational growth to reverse conventional “super-simultaneous” quantum collapse.)
Figure 2 | the role of surface tension regions in growing over the “super-simultaneityness” comes from conventional quantum mechanics for quantizing time requirements, sexual behavior finalizes the growth turnover inheritance

(a) the critical role of surface tension regions in growing over the “super-simultaneityness” from conventional quantum mechanics for non-simultaneous quantizing time, quantization of surface tension inversion units  
(b) the biological origin of bio quantum path duality from surface folding  
(c) spermatogenesis utilizes surface tension tendency to select the best turnover candidates  
(d) oogenesis utilizes surface tension tendency to select the best turnover candidates  
(e) the folding in earlier human embryogenesis  
(f) role of dorsoventral inversion in growth turnover selection  
(g) growth of cross-folded surface tension region selective permeability and flow  
(h) gut as a cross-folded surface tension region flow structured by CSF to select the best turnover nutrients by peristalsis  
(i) sexual behavior equivalent quantizing time between male and female CSFs to finally execute growth turnover selection inheritance that selects high turnover structures for the next generation. No sex, no evolution!
References

**Figures**

Figure 1 | Gravitational binding inversion energy, horizontal and vertical quantization of gravity by bottled liquids, define of memory equivalent bio-inertia, surface inversion mechanism of quantum interference

a) top: (macrocosmic) horizontal quantization of gravity by bio quantum path experiment for the definition of inversion energy. bottom: (macrocosmic) vertical quantization of gravity by falling bottled liquids and define of memory equivalent bio-inertia  
b) life range of a bio quantum path elastic model  
c) gravitational and non-gravitational impacts on a bio quantum path in a non-isolated environment grow inversion energy/quantizing time  
d) bio-system inversion energy (repetitiveness memory) growth and survival mechanism, definition of bio quantum effects (or in vivo environment) from non-simultaneousness  
e) Planck’s black body model  
f) slit surface tension inversion mechanism of double-slit & multi-slit experiments. (Note: this mechanism does reveal the quiddity of wave functions and the correlation with surface tension regions. For a single slit, the slit width must be close to the wavelength of sources, which means the left and right slit inversion surfaces compose a certain “repetitiveness”. Double-slit and multi-slit still work in the same mechanism and rely on “repetitiveness” as the basis for interference. Just conventional quantum mechanics dislikes any “repetitiveness”, then has to utilize probability “repetitiveness” to replace parameter “repetitiveness”. However, this way still can't dodge the real existing “repetitiveness” and also restrict the discipline from entering macrocosmic world for bio-systems.)

See image above for figure legend.
Figure 2 | the role of surface tension regions in growing over the “super-simultaneoussness” comes from conventional quantum mechanics for quantizing time requirements, sexual behavior finalizes the growth turnover inheritance

- **a)** the critical role of surface tension regions in growing over the “super-simultaneoussness” from conventional quantum mechanics for non-simultaneous quantizing time, quantization of surface tension inversion units
- **b)** the biological origin of bio quantum path duality from surface folding
- **c)** spermatogenesis utilizes surface tension tendency to select the best turnover candidates
- **d)** oogenesis utilizes surface tension tendency to select the best turnover candidates
- **e)** the folding in earlier human embryogenesis
- **f)** role of dorsoventral inversion in growth turnover selection
- **g)** growth of cross-folded surface tension region selective permeability and flow
- **h)** growth of mRNA splicing to select the best turnover candidates to transfer to protein levels
- **i)** gut as a cross-folded surface tension region flow structured by CSF to select the best turnover nutrients by peristalsis
- **j)** sexual behavior equivalent quantizing time between male and female CSFs to finally execute growth turnover selection inheritance that selects high turnover structures for the next generation. No sex, no evolution!

**Figure 2**

See image above for figure legend.

**Supplementary Files**

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