

Supplementary Information

Bio-inertia resonates life into evolution

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Supplementary Explanation 1 | Disciplinary difficulty in modeling evolutionary favorable mutation by a single discipline such as genetics or molecular biology Δ

Modern molecular biology and genetics like to take a "modified Darwinism" to explain evolution: there are many random mutations selected by nature and leave favorable mutations as the survivors. This statement is easy to make but difficult to clarify what is exactly a "favorable mutation". To empirically get an "unfavorable" mutation is easy, such as mutate some Hox gene for a fruit fly could make legs present on the head; this is negative to evolution. Diverse deformities from embryonic interference are all unfavorable mutations. (Here we can estimate: a species with gene number n could possess combination number of $n!$, following random theory of modified Darwinism under the certain environmental condition, the favorable mutation number is 1 and unfavorable is $n!-1$. The

probability of favorable mutation among all mutations is only $1/(n!-1)$. Human has 20K coded genes, then the probability of single gene favorable mutation is only $1/(20000!-1)$.) Whether such a quick-decaying probability with increasing gene numbers is a reality? Then what causes a “favorable” instead of “unfavorable” mutation in evolution? How can a species assure the “favorable” instead of “unfavorable” mutation in the reproduction process? Life in one generation shows adaptation and how it can become a random mutation among many generations? Darwin doesn’t know what a “favorable mutation” is, so does modern science with one and half-century’s development. This is the fundamental question in which molecular biology and genetics have to reply. Human evolved from primates, in particular, genus *Homo*, can any genetic technologies make a primate into a human being as what claimed? This is possibly what the above two disciplines try to do but incapable of handling. Therefore medical sciences take a compromised way, such as find high expression gene(s) on cancer patients then try clinical control. Such compromised ways were totally blind to *in vivo* regulations and evolution tendency. The technological incapability anxieties even drove some people to seek to edit genes of a human embryo. That affair is attributed to an ethnic problem; however, it is mainly a technological incapability. (What we can do now is in a gene-editing “Stone Age”, only isolated logically knows some individual gene functions and never knows any superposed functions. Diverse modern sequencing “big data” are still failed to offer real help or even theoretical clue for the “favorable mutation”. Technologically, if we really can experimentally make an *E.coli* into a *Pseudomonas*, or transfer species among eubacteria; that means our gene-editing technology reaches “Bronze Age”. Transfer species among Archaea and eubacteria is “Iron Age”, and so on. Only when a primate can be technological transfer into a human being, our gene editing can then enter into “Moon Landing Age”. Editing human embryo should after technology attain gene-editing “Moon Landing Age”; really not a “Stone Age” technology should try. People who wish to edit human embryos should technologically show they can make a primate embryo into a human fetus; they also need to know what a “favorable” mutation is. Like in the affair, CCR5 gene editing is claimed to “favor” human baby in resisting to HIV. This is just a human biased knowledgeable “favorable” and not a real evolutionary “favorable”. “Favorable” mutation at least means technologically corresponding to the senility processes hidden inside an embryo since all the genes are regulated by some mechanisms to cycle from young to old state in generations. Suppose a CCR5 gene editing so luckily enough to prevent HIV and also no deformities as claimed in the story; however, those who are suffering such editing result in a 1/3 lifespan with that of an unedited people similar to the cloning Dolly sheep; how people can trust them to edit a human embryo? Allow them to perform without enough qualifications means genetics needs some “human embryo editing Crisp/Cas 9 charlatan” to solve the bottleneck of its development by trying human embryo under total disciplinary blindness. The technological level of CCR5 charlatan is too inferior to make a primate embryo into a human fetus, even far less than to make a simple *E.coli* into a *Pseudomonas*. Later, we could understand that the prerequisite condition of gene editing is any operation can’t hurt the bio-inertia or gravitational binding of the bio-systems that acquired in a long term evolution.) The fact that people indeed wish “functional editing” but have to call it “gene-editing” which allows hidden failure is reflecting such “incapability”. Such “incapability” is not just technological restrictions such as unknown of “favorable mutation”; it is a disciplinary bottleneck that comes from the isolated logic method. We can simply write: species 1 + environmental entanglement 1 = species 2(evolved species 1) + environmental entanglement 2. Right now, the full sequences of almost all species are available; we still can’t get clues for how this equation working. This means the entanglement 1 and 2 are outside disciplinary parameters which can’t be fully described by the inner disciplinary parameters such as genome. To solve such out disciplinary bottleneck, we have to go back to the foundation that drives the discipline. The basis of biology is chemistry, and the basis for chemistry is physics; the only solution for the “favorable mutation” that can be modulated by “out disciplinary information” is from the physical approach starting from the abiogenesis stage.

Supplementary Explanation 2 | Increase constant K stability by ancient physical training (Verify that life is a Le Châtelier's effect accumulation system and the physical growth pattern.) ▲

The people in the video get around three years of level one ancient physical training. (In this paper, ancient means the time from 66th century BCE till the 19th century CE.) Such kinds of training have developed for more than one thousand years with reliable historical records. In modern society, almost no one interests or understands them; we still have to refer to them since we really can't find any replacement for the biological and medical significance of this system after so long a human history. It seems odd that there are so many countries in the world, why such system only presented in China? Some countries such as Japan and Korea were the closest neighbors, which could easily study from China. Why for a millennium, they still failed to get the quintessence and only developed some terminal technologies from what they learned into Judo and Taekwondo. We also interested in the possibility of our nearby ancestors such as *Homo erectus ergaster*, *Homo floresiensis*, *Homo neanderthalensis*, had once applied such physical self-striking technologies, or whether *Homo sapiens* had once taken such technologies to rival them. (Monkeys and gorillas in zoos have been watched to demonstrate "fist-self-strike on body" activities occasionally, just don't know whether our above nearby ancestors have developed such unintentional activities into systematic training.)

It widely accepts that physical exercise can benefit health. Nowadays there are already hundreds of types of well-developed sports, from athletics, cycling, fencing to swimming, etc. However, there is still no reliable data that can be found which can correlate any sports with a health condition or even lifespan; also, none of the above sports are proof capable of "defending" any medical disease. (Some of the competition sports even damage the knee joints and quite negative to lifespan.) Due to lack of reliable data, medical sciences have to take a descriptive manner, such as "persistent moderate strengthen sports benefits health", and still fail to tell "how" to benefit. On the other hand, biology and medical sciences have created many indicators, such as blood pressure, hematopoietic stem cell counting, tumor markers, albumin concentration, etc. The problem is that till today, neither any one of these indicators or any combinations can reliably quantify health conditions and guide for rejuvenation. No doctor can tell between two people with acceptable indicator ranges (or in their words without any known medical defined disease), who is more healthy. (Later we'll see the only standard for healthy is gravitational binding level or R_{hv} .)

All the problems came from the fact that sports and relevant scientific guidance have never distinguished from conservative or non-conservative force training that we will discuss later. Bio-systems and evolution is a process of splicing out non-conservative forces and strengthen the conservative forces for maintenance. Therefore, the physical training which strengthens the conservative forces inside the body will benefit health and lifespan. The physical training which utilizes the non-conservative forces is actually harmful to health. Since the total conservative forces or signals which come from parents are limited and quite difficult to be increased. The sports which compel more percentage of the conservative forces into non-conservative forces will be harmful to health and lifespan. We can see a concrete example from ancient boxing technology. Modern boxing trains people with punch bags and other auxiliary methods; then they can defeat an opponent with speed, strength, and skills. It is a kind of non-conservative force training which the body has to compel conservative forces into non-conservative types. Therefore, after the high-performance stage (some people 30s and some can be extended to 40s years old), it will then observably hurt the health and lifespan, even if we reduce the strength of training will not offer any help. Since it only training for some clusters of muscles, just by reducing the strength of the training, our body still can't get balanced stimuli. Different from the modern physical system, ancient boxing (**Suppl. Movie 1.1**) is a kind of conservative force training. It can start from around 7 years old till the final year of life continuously benefit health and life span. Just refer to muscles; there are around 700 named skeletal muscles, one set of cardiac muscles, and countless smooth muscles in a human body. We are tired or accumulated metabolism waste in certain parts of the body is not because we use our muscles to physical limits; it is mainly because we use our muscles in an

imbalanced way. All our muscles, ligaments, and joints, no matter large or small, always possess three states for stretching or contracting: maxima, minima, and median. Balanced training at least means all muscles, ligaments, and joints get physical stimuli, and all of them get a balanced ratio on maxima, minima, and median states. Modern boxing is definitely not a conservative force training, some muscles get stronger stimuli, and some are not. Bodybuilding is also not a conservative force training, the targeted skeleton muscles get maxima stretch or contract stimuli but less relax stimuli, and other out-target muscles get less training; also almost no ligaments and joints get training. Most of the bodybuilding trainers, after high-performance age, their muscles will gradually be retrograded. This proves that it is still not fit for people after high-performance age. Actually, more than 80% of the hundreds of modern Olympic Game sports are not conservative forces training; therefore, will hurt health after high-performance age. Even people really need Olympic gold medals for certain reasons; they should at least shift to ancient boxing after that age. (E.g. Marathon is not a good sport since it severely damages knee joints. Even if reducing the strength of training, it is still wearing down the cartilages on the surface of the patella of marathon athletes. Generally, there are 6mm of cartilages on the surface of the patella; marathon athletes usually wear down more than half. However, race-walking is better since it forces people to reduce the movements of knee joints. For ordinary people in the gym, they really should take the race-walking style instead of marathon style on a treadmill. Just this simple modification can extend the lifespan of a person for at least ten years under the same conditions. It's not surprising that modern doctors and scientific guidelines world-widely have failed to make this simple suggestion. It is astonished that ancient people in one thousand years ago had already known this profoundly. I personally really don't know how they got to know this from a time which notoriously short of scientific knowledge (medieval period), just know they have developed extensive training to help people utilizing hip joints to replace knee joints then extend lifespan, they called such training "open hip joints". Only after such training fulfilled, then people can train for ancient boxing. Later we'll see, "open hip joint" to largely replace knee joint functions is really a perfect way to follow the evolutionary trend. Just for this simple prerequisite training, ancient boxing really can replace most of the modern Olympic game sports, at least after higher performance age. We should understand that older people always face a severe dilemma; their bodies need movements; however, the knee joints have retrograded, then even a slow walk will hurt the joints. To avoid such a dilemma, to protect the ligaments from a young age is a must. Ancient people believe ligaments are more vital than that of muscles.)

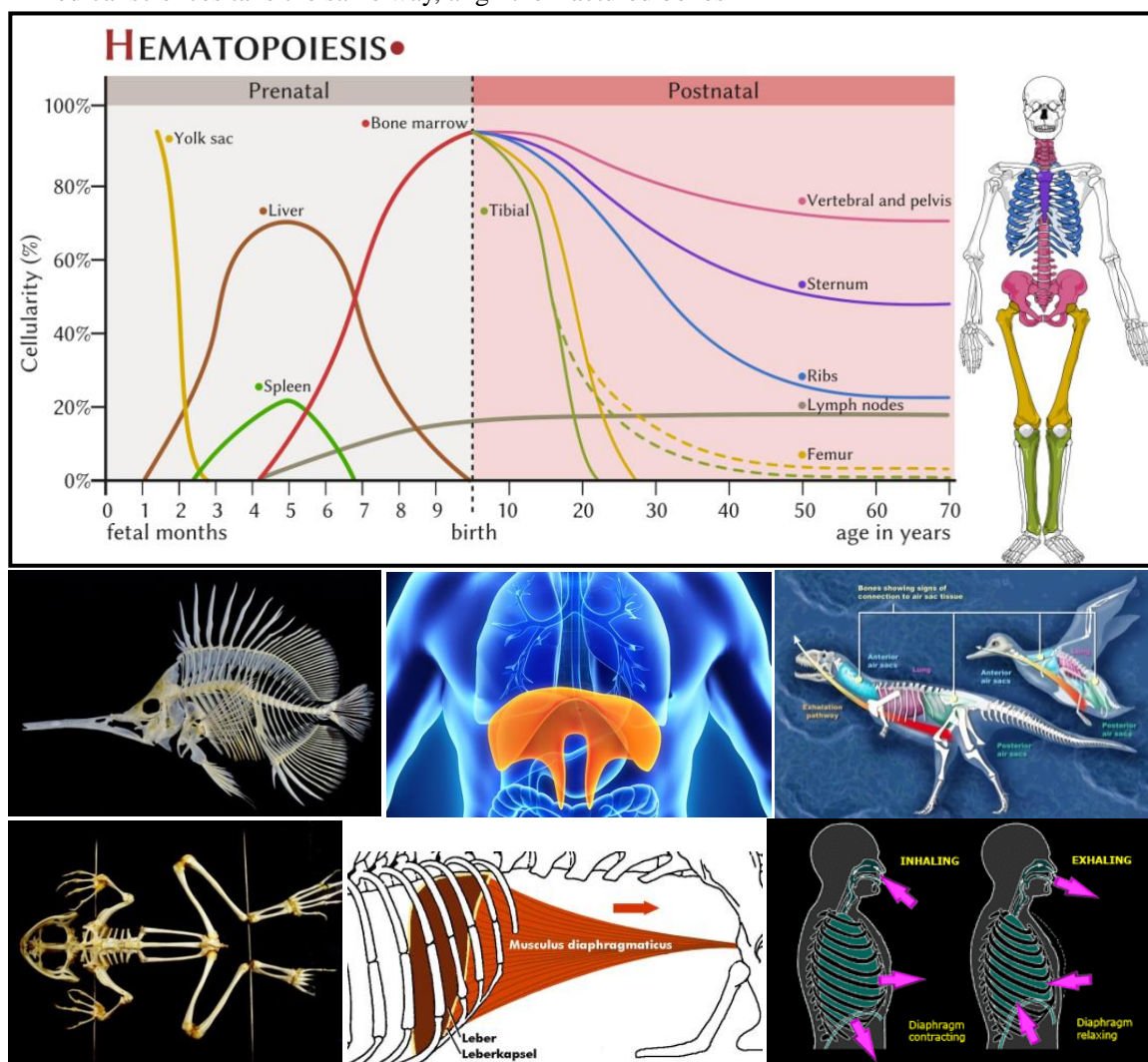
A physical strike is a complete conservative force training system if being properly arranged. It is fit for all sorts of people, no matter young or old, male or female. (We also need to know one fact. For ordinary untrained people, they will feel pain while affording physical strikes; pain means their bodies get hurt. However, for the well-trained people, even face much more powerful physical strikes than those of untrained people, they still never feel any pain. In contrast, most people even feel happy while such strikes improve their bio-inertia. On a daily physical strike training status, some people will feel very uncomfortable while someday they don't get physical strikes. Their bodies need such physical strike signals like we need food and water as signals.) Also, a physical strike is not just a training technology but also a reliable measuring of health conditions. No matter which conditions and which part of the body, if there are no severe problems such as organ transplantation or open wound, just a simple strike could reveal relative health level ("relative" means compare same part of the same person at a different time, for those who never get physical strike training it is still a good measure, just need to reduce the strength of physical striking). Historically, the physical strike is the father of massage and acupuncture, physical training has definitely inherited well before the time of establishing of Shaolin, albeit it is only passing among selected sects and not public. The channel systems of acupuncture actually came from it since people found strikes on the different parts of the body could get different effects and wrote down their experiences. However, acupuncture likes most of the modern medical methods can be only applied to patients and not for healthy people. Massage can be applied to healthy people. However, only acts on shallow tissue and effects are quite limited. For

those who get proper physical strike training, massage will be no use. They take ancient boxing to relax their bodies after training, never take any massage.

The people in the (**Suppl. Movie 1.0**) get the level one ancient physical training for three years. They come from a training school (non-Wudang or Shaolin derivative schools). Today in China, there are hundreds of such kinds of schools offer above physical training for people aged from 18-35 years old. Also, part of the policeman and the army's regular training absorbed some ancient methods. These schools derived from around 30 ancient sects. Level one means the training doesn't involve any training of the human spinal column. Level two and level three just different manners of utilizing the spinal cord for conservative forces training.) In such a way, the resistance to physical strikes will improve at least more than 20 times. Level two and three only inherited among two top ancient sects: Shaolin (established in 477 CE) and Wudang (established earlier but became famous from Sanfeng Zhang who born in 1247 CE). Level two and three training reveals that the human spinal column is the largest recover structure in a human body. Today such training schools only accept people older than 18 years old. However, formal ancient Wudang Taihe training starts with a newborn baby. From the first day of born, the trainer begins to knock on the back of the baby (**Suppl. Movie 1.2**), then till the 6-month weaning stage, he (she) has already can resist relative stronger physical strikes for hundreds of times easily. (Not just resist stronger strike, for all the babies I did training, everyone unexceptionally happy smile to me just one month once they know how to smile. This training method has finalized since 590 years ago, which means such happy smiles induced by training have existed in Wudang (Taihe) for 590 years. Such happy smiles demonstrate to us that physical strike is really a successful technology. Today we have had a lot of medical interference technologies, from aspirin, antibiotics, vaccine till bone marrow hematopoietic stem cell transplantation, etc., I never heard of any one of them can naturally give a baby such a happy smile, or potentially capable of offering so. Definitely, such training not necessarily starts from a baby stage. I have over 20s while I got the first training. Some people started from 35 still reached a higher level.)

Ancient people design such kind of training because they believe bones should entangle with the somatic body in ideal conditions, recover to the early fetal stage where fleshes and bones are still not separated. Modern science proves that at the embryonic stage, cells need migration into bones; that is possibly the entanglement that ancient people believe in. We also can see this trend from vertebrate evolution. As in the figure, the archaic fishbone directly entangles widely inside the somatic body, and later fish such entanglement gradually reduced. To amphibian frog, most of the entanglements replaced by the air sacs and widen spinal column, no ribcage for lungs. To bird and dinosaur, ribcage grows out from the widen spinal column of the frog. Then it is air sacs transfer part of the oscillation from the spinal cord to the ventral side to auxiliary the ribcage region. To crocodile, air sac functions gradually replaced by transitional diaphragm: diaphragmaticus. To the human, diaphragmaticus evolved into the diaphragm. However, the functions of transferring part of the spinal column-ribcage oscillation to the abdomen are still not changed. (For the ventral side where lacks the ribcage, the diaphragm must transfer the oscillation from ribcage to abdomen via respiration and other activities.) Ancient people have an extensive training system to develop such diaphragm functions for the adult stage. (It is called "organ strike", organs such as heart, lungs, liver, gut, etc., follow the diaphragm to oscillate vertically, ref. (**Suppl.Movie.7.7**) later.) Therefore, for a baby strike on the spinal column, esp. with the ribcage region will benefit development, enhance hematopoiesis, and help later training. See top figure from modern science, hematopoiesis the ratio of cartilages around the sternum can directly reflect lifespan, then strike on the babies' back can transfer oscillation from the spinal column to sternum, that is vital for lifespan. Their practices are corresponding to modern hematopoiesis theory in the top figure. We could also see, two largest communities in the biological kingdom are fungi and insects. Insects possess exoskeletons, their entanglement of soft part, and the hard part of the body can function well. Their respiration structures are directly on the exoskeletons, no need of something like the diaphragm or air sac for transferring respiratory oscillations; this

is possibly the reason they can adapt to the environment quite well in their size and establish such huge communities (This advantage only effective for small body size.). Also, for a bone fracture, ancient people and modern medical sciences take the same way, align the fractured bones



and let them grow back. For which kind of the “forces” can make fracture bone “stick together”, ancient people believe that is abovementioned entanglement forces between the bone and non-bone part of the somatic body. Thus after we align the bones, the whole non-bone part of the somatic body will work together to drive bones growth together. Their physical strike training for babies from their words is to strengthen such kind of “binding” forces. It is definitely a holistic force from the whole body, and not any local forces can handle. Modern medical sciences can’t find exact ingredients or cascade such as gene, RNA or cells responsible for the recovery of bone fracture, also can’t find any artificial sticky material can “stick” fractured bone together. On the bone fracture repairing, we have to admit that ancient theory VS practices are more compatible than those of modern medical theory VS practices. (Now we need to clarify two terminologies which we’ll possibly refer to later. **Kungfu** is an ancient derived physical training system for conservative forces. It includes physical striking, gulping air, ancient boxing and sex control technology, etc. Ancient martial art (or call Wushu), a fighting system about how to use diverse ancient weapons, is actually a non-conservative force training system which equivalent to diverse modern sports. They are totally different things, albeit usually train together. Kungfu can steady bio-inertia while Wushu and diverse modern sports can’t. We can mix kungfu with diverse sports or even non-sport activities; this way can improve bio-inertia and solve the bottleneck of sports or non-sport activities, similar to ancient people mix kungfu with wushu. The

western public began to know the terminology “kungfu” from Bruce Lee, a Hong Kong-American actor, director, and martial artist; however, what Bruce Lee trained was not kungfu; he still exactly trained in Wushu. His training system never concerns with the spinal cord.)

Supplementary Experiment 1 | Impact of persistent rainwater physical strikes on the germination rate of mung bean seeds (Verify the decisive evolutionary role of rainwater physical strikes on plants) ▲

For ancient physical striking training on the adult stage, Wudang has 36 categories of tools with diverse ways of striking on the different parts of the human body at different times. Shaolin has 72 categories of striking training. The combinations of the above categories can derive hundreds of “ancient indicators” for the success of striking training. If we choose modern biological indicators we should get more than those of ancient numbers, examples such as vital capacity, elastic capacity of joints & ligaments, body fat thickness, certain muscle strength, diverse hematopoiesis biomarkers, certain immune cell ratio, certain RNA concentration, certain proteins or enzymes, mitochondria counting, developmental signals such as Wnt, certain metabolisms, and all their effective combinations etc. (Ancient indicators are designed and verified by those who involve in real training; therefore, the hidden purposes are for better training. Modern indicators seek a general logical pattern among professionals and the public; therefore, the hidden purposes are for theoretical education before real practices, thus not necessarily designed by some people who really get training. The integration of these two systems needs long term work.) To make things easy and reliable, in this paper, we only choose “stem” indicators. That means once the “stem” indicators get verifications, hundreds of derivative indicators or their combinations that correlate with the “stem” indicator will also be confirmed under certain experimental designs. In such a way, we can save time for hundreds of experiments for each species among millions of extant species. The “stem” indicators we choose are only germination rate, sprout length, body weight. Such simple indicators should be general enough to be performed by all the species on Earth. Also, their correlations with derivative indicators follow the evolutionary trend very well.

Method:

20g high-grade mung bean seeds, 5% H₂O₂ sanitation for 5min, wash clean, soaking in water for 8 hours. Then put in a 20×10cm holed plastic box with thick tissue paper and transfer into a climate control chamber with 25 °C, 85 % RH (natural light from the glass door). Control with water fully soaking on tissue papers, but shield water splashes to seeds. With a peristaltic pump, treatment A allows water to flow from tissue paper thus horizontal water waves can attain each seed but not drift them. Treatment B makes an artificial shower assure every seed, and later every seedling can get continuous drops of water shower. (RO water drops from a sieve 50cm height, persistent artificial rain on the region. For such experiments, the speed and strength of rain do not matter. Just assure they are continuously beating on sprouts which possess the higher responsive recovering capability.) Measure the germination rate at 12,16,20,24 hour (random 100 seeds, while the sprout over the seed length then counting as germination, ×3), and the sprout height (random 25 sprouts, ×3) at 24, 36, 48, 60, 72, 84 hours.

Mung bean sprout germination rate at 12, 16, 20 and 24H for different treatments


Hour	12			16			20			24		
CK%	47	51	49	59	56	52	89	86	82	94	97	92
CK_ave	49.00			55.67			85.67			94.33		
CK_std	2.00			3.51			3.51					
A%	52	55	54	58	62	57	88	89	92	91	96	97
A_ave	53.67			59.00			89.66			94.67		
A_std	1.53			2.65			2.08			3.21		
B%	57	58	55	65	61	67	86	89	93	91	97	98
B_ave	56.67			64.33			89.33			95.33		

B_std	1.53	3.06	3.51	3.79	
ANOVA of mung bean germination rate at 12,16,20,24 hour (F _{0.01} (2,6) = 10.92 , F _{0.05} (2,6) = 5.14)					
	Source	SS	df	MS	F
12 H	Between treatments	89.56	2	44.78	15.49 **
	Within Treatments	17.33	6	2.89	
	Total	106.89	8		
16 H	Between treatments	114.67	2	57.34	6.00 *
	Within Treatments	57.33	6	9.55	
	Total	172.00	8		
20 H	Between treatments	29.56	2	14.78	1.53
	Within Treatments	58	6	9.67	
	Total	87.56	8		
24 H	Between treatments	1.56	2	0.78	0.075
	Within Treatments	62.04	6	10.34	
	Total	63.56	8		

ANOVA results demonstrate that at 12H and 24H water strikes significantly impact on germination rates. LSD (Least significant difference) comparisons of the significant difference of mung bean sprout germination rate for 12H and 16H time points (20 and 24H there is no statistically significant difference) are on the following table.

	Treatments	Average	Xt_ave – CK_ave	Xt_ave – Xt'_ave	
12H	B_12H	56.67	7.67**	3.0	$t_{0.05}(6) = 2.447$, $t_{0.01}(6) = 3.707$
	A_12H	53.67	4.67*		$LSD_{0.05} = 3.397$
	CK_12H	49.00			$LSD_{0.01} = 5.15$
16H	B_16H	64.33	8.66 *	5.33	$t_{0.05}(6) = 2.447$, $t_{0.01}(6) = 3.707$
	A_16H	59.00	3.33		$LSD_{0.05} = 6.17$
	CK_16H	55.67			$LSD_{0.01} = 9.35$

At 12H artificial rainwater strikes on the mung bean seeds significantly increase germination rates (both horizontal treatment A and vertical treatment B). At 16 H vertical strikes increase germination rates, from 20 to 24H, there is no significant difference between CK and treatments. Artificial rainwater physical strikes enhance the mung bean germination rate at an early stage.

Supplementary Experiment 2 | Impact of rainwater physical strike effect for mung bean sprout growth length (cm) (Method in Suppl. Exp.1., Verify the decisive evolutionary role of rainwater physical strikes on plant seeds and germination.) 

Mung bean sprout germination length at 24, 36, 48, 60, 72 and 84H for different treatments

	24	36	48	60	72	84
CK1	2.1	2.9	4.2	6.4	9.1	11.6
CK2	2.4	3.3	4.5	6.2	8.7	11.2
CK3	2.3	3.2	4.7	6.6	8.8	10.9
CK_ave	2.27	3.13	4.47	6.40	8.87	11.23
CK_std	0.153	0.208	0.251	0.200	0.208	0.351
A1	2.2	3.6	4.5	6.2	8.7	11.9
A2	2.8	3.5	4.9	6.8	9.4	11.4
A3	2.7	3.3	4.6	6.6	9.1	11.8

A_ave	2.57	3.47	4.67	6.53	9.07	11.70
A_std	0.321	0.153	0.208	0.306	0.351	0.265
B1	3.2	3.8	5.1	7.4	9.6	12.9
B2	3.1	3.9	5.3	6.9	9.5	12.8
B3	3.4	3.7	5.5	7.2	9.8	12.6
B_ave	3.23	3.80	5.30	7.17	9.63	12.77
B_std	0.153	0.100	0.200	0.252	0.153	0.153

ANOVA of mung bean sprout length at 24,36,48,60,72,84 hour ($F_{0.01}(2,6) = 10.92$, $F_{0.05}(2,6) = 5.14$)

	Source	SS	Df	MS	F
24 H	Between treatments	1.47	2	0.735	14.70 **
	Within Treatments	0.30	6	0.05	
	Total	1.77	8		
36 H	Between treatments	0.67	2	0.335	13.4 **
	Within Treatments	0.15	6	0.025	
	Total	0.82	8		
48 H	Between treatments	1.14	2	0.57	11.87**
	Within Treatments	0.29	6	0.048	
	Total	1.43	8		
60 H	Between treatments	1.01	2	0.505	7.77*
	Within Treatments	0.39	6	0.065	
	Total	1.40	8		
72 H	Between treatments	0.95	2	0.475	7.54*
	Within Treatments	0.38	6	0.063	
	Total	1.33	8		
84 H	Between treatments	3.71	2	1.855	25.76**
	Within Treatments	0.43	6	0.072	
	Total	4.14	8		

ANOVA results demonstrate rainwater physical strikes significantly impact on the mung bean sprout growth length at 6-time points: 24H, 36H, 48H, 60H, 72H, 84H. The following are LSD comparisons for further analysis treatment A and treatment B at each time point.

	treatments	Average	Xt_ave – CK_ave	Xt_ave – Xt'_ave	
24 H	B_24H	3.23	0.96 **	0.66	$t_{0.05}(6) = 2.447$, $t_{0.01}(6) = 3.707$
	A_24H	2.57	0.30		$LSD_{0.05} = 0.447$
	CK_24H	2.27			$LSD_{0.01} = 0.677$
36 H	B_36H	3.80	0.67 **	0.33 *	$t_{0.05}(6) = 2.447$, $t_{0.01}(6) = 3.707$
	A_36H	3.47	0.34 *		$LSD_{0.05} = 0.319$
	CK_36H	3.13			$LSD_{0.01} = 0.483$
48 H	B_48H	5.30	0.83 **	0.63 *	$t_{0.05}(6) = 2.447$, $t_{0.01}(6) = 3.707$
	A_48H	4.67	0.20		$LSD_{0.05} = 0.438$
	CK_48H	4.47			$LSD_{0.01} = 0.663$
60 H	B_60H	7.17	0.77 **	0.64 *	$t_{0.05}(6) = 2.447$, $t_{0.01}(6) = 3.707$

	A_60H	6.53	0.13		LSD _{0.05} = 0.509
	CK_60H	6.40			LSD _{0.01} = 0.77
72 H	B_72H	9.63	0.76 **	0.56 *	t _{0.05} (6) = 2.447, t _{0.01} (6) = 3.707
	A_72H	9.07	0.20		LSD _{0.05} = 0.501
	CK_72H	8.87			LSD _{0.01} = 0.759
84 H	B_84H	12.77	1.54 **	1.07 **	t _{0.05} (6) = 2.447, t _{0.01} (6) = 3.707
	A_84H	11.70	0.47		LSD _{0.05} = 0.536
	CK_84H	11.23			LSD _{0.01} = 0.812

The results demonstrate that vertical water strikes at all 6-time points: 24H, 36H, 48H, 60H, 72H, 84H, the growth lengths for treatment(B)s are significantly longer than that of the control. For horizontal water wave tide treatments (A), only at the 36H time point, the length of mung bean sprouts is significantly longer than the control. Also, the growth lengths of vertical water strike treatments (B) are significantly longer than that of the horizontal water wave tide treatment (A)s at 36H, 48H, 60H, 72H, 84H time points. This experiment still can be verified by most species on Earth, if we can arrange the physical strike forces from rainwater can hit the germination or the young part, absolute data reproducible.

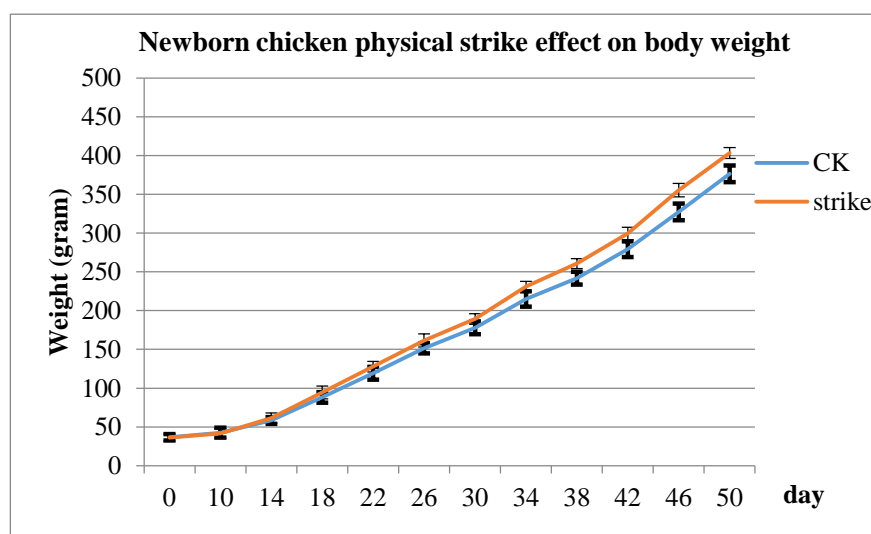
Supplementary Experiment 3 | Impact of artificial physical strikes on the growing weight of newborn leghorn chicks (Verify the decisive role of physical strikes on development and evolution of vertebrates) Δ

The earliest training time for Shaolin physical strike is 7-8 years old, and there is no sequence of which part of the body starts first and which tools are applied. Wudang training starts from the first day of born; however, at this stage, only knock on the baby backbone region; other places of the body are forbidden to strike on (Ref to **Suppl. Move 1.2**). Here we take the Wudang training system and body weight as a “stem” indicator. Actually, for the animal at the growth stage, body weight is still the best and the most general indicator of the health condition. Diverse modern medical indicators are for disease and not for a health state.

Method:

30 newly hatched normal* chickens (Beijing You chicken) as treatment and CK with similar conditions and approximately average body weight **. Each group needs 2-3 more animals, and everyone marked with a number, if some of the chosen chickens are dying, then compensate with the closest animals. The male and female ratio must be the same (we finally get 20 ♂, 10 ♀ each group). For the treatment starts from the first day, grab a baby chicken, inner palm under the abdominal region and two fingers hold the head, use a wood ruler 5×30×1cm, wrap with 1-3mm soft materials such as rubber, strike the back region of the chicken with ribcage for 30 times at around 2-3s intervals. This is one set, three sets of training every day at morning, noon, and night to strike on every member. At the start, each set composed of 30 beats, each 4-day increase 10 beats, that is at day 4 increased to 35 beats and day 8 increase to 40 beats, then continuous increase at the above pattern. The strength of the strike can't be too heavy to hurt the baby chicken or make any bruise on the surface or deep tissue; also, it can't be too slight. The beat oscillation should at least transfer to sternum regions, which can be felt by the hand on the region. The best striking could hear lower-pitched infrasound in a silent room. That means the oscillation of ribcage compatible with its surrounding soft tissue, or the hard part and soft part of the ribcage region attain a resonance. (Ribcage is a good resonance cavity. Human singers usually rely on their ribcages for baritone or contralto resonance effects. The physical strike can equivalently activate such resonance effects. Animal ribcages are not inferior to the human counterpart; therefore, we can hear infrasound if strike properly. However, even if no such sound will not influence the experimental results if we can follow the code of strike, not too heavy to hurt and not too slight to short of transferred oscillations on the sternum region. And while the striking number attains 300, then increase the strength around 1/6 and then make beating number reduce back to 30, and continuously arranges such pattern. For the increase of strength, if the animals show cooperation in some degree, then such an increase is proper.) This training

method comes from Wudang and has been finalized since 590 years ago, well before the time when Isaac Newton was born. It has definitely accumulated the experiences of thousands of people in history. The original method for human baby starts from 30 strikes/set, 6×3 sets/daily, and every 6-day increase 5 strikes for each set consider the lifespan of animals, we modify the increase pattern. Also, Wudang training takes human palms and fists at the start, which later will change to other tools. We only use a simple tool in the whole animal training. This tool simulates one of the ancient tools made of Sika deer (*Cervus Nippon*) tendons and wood for human training. In here, we just want to show that animals can equally get similar human training effects; therefore, the striking tool should be no big difference. (In the future people are free to do research on better tools or methods for striking animals.) CK group not takes the physical strike and keeps the same conditions with the treatment group. (The methods in (Suppl.Exp.3, 4) are directly from the ancient striking system, only slight modifications. And the methods in (Suppl.Exp.1, 2, 5) are modern designs that mimic the ancient system. All these physical strike experiments and their derivative designs are general enough to cover almost all species.):



day	CK	RSD	strike	RSD
0	36.8	4.16	36.2	4.43
10	42.6	6.42	41.5	6.22
14	58.4	4.44	61.3	6.56
18	88.2	6.85	94.4	8.26
22	119.1	8.24	127.7	6.76
26	151.4	6.56	161.5	8.41
30	177.9	8.23	189.3	6.81
34	215.0	10.06	231.1	6.44
38	241.7	8.27	260.7	6.27
42	279.4	10.12	299.5	8.13
46	327.3	10.67	355.4	8.62
50	376.5	10.85	403.3	6.87

* For human babies, the conditions which not fit for a physical strike are rare, cases such as surgical,

organ transplantation, body outside lesion or inner bleeding, the congenital heart defect, and diverse physical deformities such as orofacial cleft, etc. Developmental physical deformities are those come from *in vivo* and not *in vitro* factors, therefore not fit for a physical strike. For animals, "normal" refers to the same connotation. Animals with similar conditions are not fit for use.

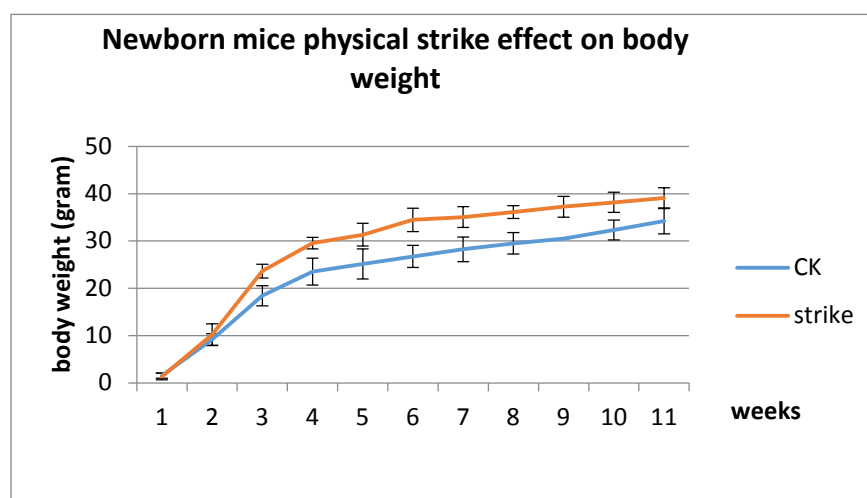
** For newborn physical strike on animals or human beings, the fundamental method should measure the whole lifespan as in (Fig.1a). Bodyweight is just a quick estimation method. We should note that increased bodyweights are lean meat and not adipose tissue. (If any physical training increases adipose tissue, means it greatly damages bio-inertia for certain wrong operations and must be discarded.) We can visually see that the animals get physical strikes are healthier than those of the CK group. Any indicators that correlate with health and are not shielded by the system should get positive results.

Supplementary Experiment 4 | Impact of artificial physical strikes for the growth of newborn Balb/C mice (Verify the decisive role of physical strikes on development and evolution of mammals) ▲

Method:

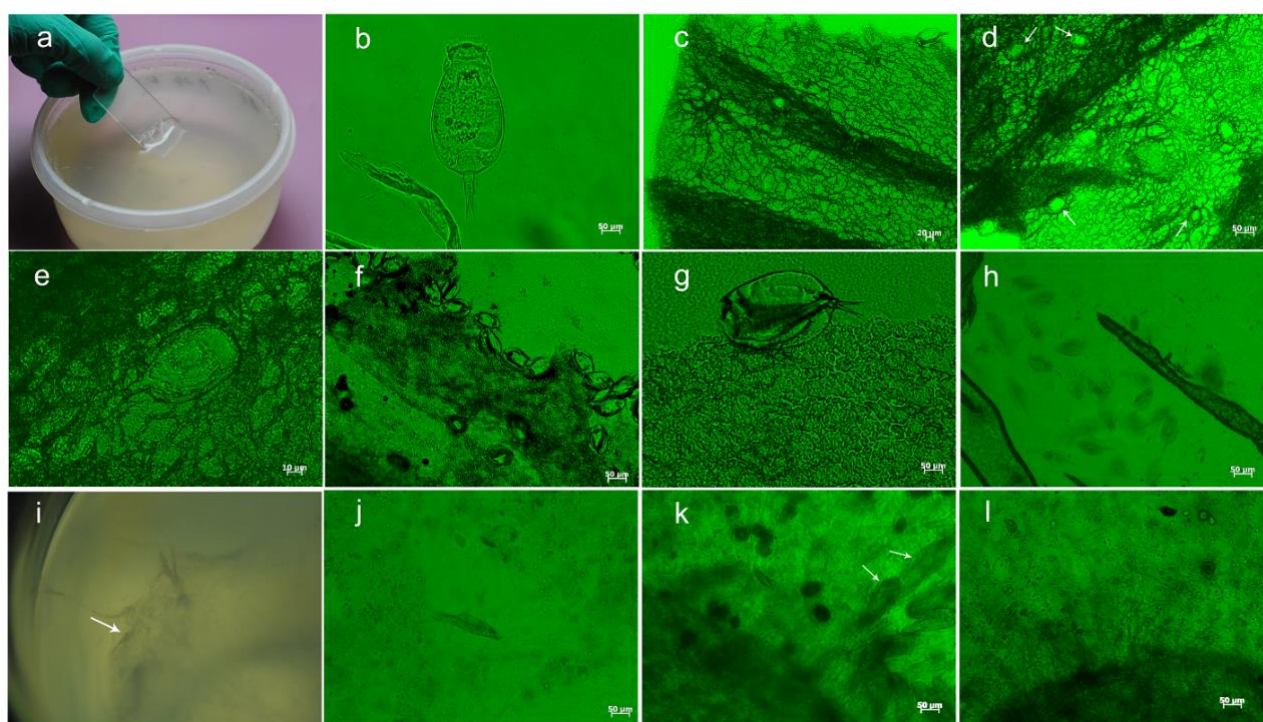
Similar with (Suppl.Exp.3), 30 (5 animals /cage) mice for CK and 30 for the treatment group, for one batch of baby mice from mother only choose 5 baby mice; however, all batch marked with a number. If one chosen mouse is died just compensate with most closed mice; some of the batch animals are not on the same day, just record and put into the same curve by day. Striking tools and methods are the same; to simple, we only use male mice since they will mature in 4 weeks; strike pattern is still 30 each animal and increases 5 on 4th day and 1st day of a week. (Mice must be put back to animal facility at night, difficult to take ancient 6-day increasing period, therefore, change to 7-day change period. And after 2 weeks they will possibly bite a human finger, so need very careful to avoid that,

just first grab the head from the back neck region then strike. And from the back region, we have to depend on experiences acquired from the previous 2 weeks for strength.) We should realize that physical strike is different from that of ordinary sports training. All the mice are free to use sports tools such as running wheels. For previous chicken physical strike training, just 3 weeks they are released to outside for grazing at daytime, back to cage at night. This means physical strike training can be effective for human beings or animals, both involving and not involving sports. Most sports are not training for conservative forces, and physical striking does training for that if properly handled. Later we'll see, growth and evolution are driving by conservative forces:



weeks	CK	STDV	strike	STDV
0	1.53	0.52	1.37	0.71
3	10.16	1.21	10.21	2.32
4	18.43	2.15	23.63	1.46
5	23.54	2.85	29.55	1.23
6	25.17	3.17	31.34	2.43
7	26.72	2.33	34.48	2.47
8	28.25	2.61	35.06	2.22
9	29.51	2.26	36.11	1.34
10	30.47	2.27	37.23	2.17
11	32.33	2.12	38.17	2.14
12	34.19	2.67	39.11	2.12

Supplementary Experiment 5 | Impact of artificial oscillating forces on reproductive structures of *Cephalodella auriculata* (Verify that the reproductive process does require physical signals. Some single-celled species have evolved the reproductive structures floating on the water surface to collect physical oscillations for their reproductive requirements, equivalent to diverse advanced species spermatozoa swimming. This experiment also reveals the physical origin of bio-membrane, to get the differential frequencies on a different side) Δ



(a) the sampling of *Cephalodella auriculata* reproduction membrane on the water surface. Use a glass slide to sample this membrane and directly observe under

the microscope. (b) *Cephalodella auriculata* (c) from the water membrane, we could see the noticeable dark and light textures, and the baby cells could present in both types of textures. (d) arrows pointed to some baby cells. (e) one baby cell inside the membrane. (f) mature baby cells accumulated on the edge of the water membrane. (g) one of the mature baby cells, it needs to stay for about twenty minutes then begin to swim. (h) more baby cells start to swim. They move swiftly, so it is difficult for the microscope to get a sharp image. (i) in contrast to the reproduction structure of *Paramecium spp.* is under the water surface. (j) *Paramecium spp.* (k) (l) the reproduction sites of *Paramecium spp.* inside a dead and fungi proliferated zebrafish egg.

The key point for the success of a physical strike experiment is that the “strike” must be put on young or higher bio-inertia parts. (Senility is a process of decaying Le Châtelier’s effect; therefore, the physical strike effect will be dampening.) However, to isolate the active or young cells from single-celled living beings for physical striking is challenging. It is difficult to take a flow cytometry sorting or any other technologies to separate the young or the high bio-inertia state cells from a growing population. We are lucky to find a species *Cephalodella auriculata* for such an experiment. This species was first described by Müller in 1773 and rarely reported later. We found its reproductive structures are flowing on the water surface. As in the figure, we use wheat granules and *Saccharomyces cerevisiae* tablets (a bottled nutritional tablet on the market) to raise *Paramecium spp.* as food for newborn baby zebrafishes, only after weeks, they can eat brine shrimp (*Artemia spp.*). Each container for hatching baby fish in the lab is the same size as in figure (a). Use such container to fill with water and add 3-5 wheat granules and one *Saccharomyces cerevisiae* tablet; then in a week, it will full of *Paramecium spp.*, sometimes *Cephalodella auriculata* produces a white water membrane on the water surface.

Method:

Once find the white membrane on the container surface, then use a clean slide to sample one slide of the white membrane into another clean container with zebrafish infused water, check the white membrane with a microscope to see whether baby cells of *Cephalodella auriculata* presented. The container is not necessarily be sterilized but needs to be rinsed with Holtfreter’s solution, then filled with zebrafish tank infused water (Such water has been filtered and circulated by the system). The room temperature for the zebrafish facility is 28 °C. Add one tablet of *Saccharomyces cerevisiae* and few sterilized wheat granules into the water. (While we raise *Paramecium spp.*, the wheat granules are not sterilized since *Paramecium spp.* cells are mainly from them. Here we use sterilized granules just to assure the container full of *Cephalodella auriculata* and no *Paramecium spp.*) After 3 to 4 days, sample the water to check for *Cephalodella auriculata*, if they are in higher counting, then in a 50ml centrifuge tube with 30ml sterilized water add 10ml *Cephalodella auriculata* water. In 9 same size containers filled with the same amount of zebrafish system infused water, mix well the 50ml centrifuge tube and inoculate 5 ml of water into 9 containers, each with 800ml water. Then these 9 containers have an equal amount of water and *Cephalodella auriculata* counting. Each container adds one tablet and three sterilized wheat granules. Put 3 containers in a quiet place as CK. Treatments and negative CK on another table with 6 containers attached to one mechanic clock (diameter 28.7cm) by an adhesive tape, the vibration of the mechanic clock will then be transferred to the attached containers quite well. Assure the 6 containers get even oscillation impact, and the clock works continuously. For CK group needs to assure they don’t get any mechanic oscillation including humans walking around, and also try to keep all the containers with equivalent conditions. (In Tsinghua University no lab can satisfy the experiment, I have to drive 25km to a quiet farm which no human walking around and vehicle traffic within 50m range of the house.) In around 2 days after feeding, the white membranes will be presented. At day 4 they will begin to release babies. In 6 days all the babies inside the white membrane will be released out. For negative CK use a glass rod to damage the white membrane every day three times, assure no white membrane can restore. At day 7 mix well the water inside each container and then use a Hemocytometer for cell counting, each container 3 repeats, visual dead cell are not counting.

Cell counting of different physical treatments of *Cephalodella auriculata* (cell/ml)

Container	CK	Ave	Treatment	Ave	Neg CK	Ave
	3.7×10^4		8.2×10^7		2.1×10^3	

1	3.3×10^4	3.8×10^4	6.2×10^7	5.5×10^7	3.6×10^3	3.0×10^3
	4.3×10^4		2.1×10^7		3.3×10^3	
	7.7×10^4		6.4×10^6		6.1×10^3	
2	6.3×10^4	6.3×10^4	5.6×10^6	5.2×10^6	5.4×10^3	6.4×10^3
	6.1×10^4		3.7×10^6		7.8×10^3	
	6.4×10^4		3.1×10^6		7.4×10^2	
3	4.1×10^4	5.4×10^4	3.7×10^6	4.7×10^6	6.3×10^2	5.8×10^2
	5.8×10^4		7.3×10^6		3.7×10^2	
	Ave	5.2×10^4		2.2×10^7		3.3×10^3

*Negative CK reveals the physical oscillations are mainly procured by the above water surface membrane, not by underwater structures. *Cephalodella auriculata* naturally “isolate” their baby cells from the adult cells for physical vibrations; therefore, we can easily get the results. Use *Paramecium spp.* in the same environmental niche for the same trial, the mechanical clock doesn’t significantly impact the reproductive rate, that is definitely due to their reproductive structures are not on the water surface. As in the figure, their reproductive structures are under the water surface (Fig. i, j, k, l). However, their reproductive processes still definitely need physical signals like all the biological reproductive processes on Earth, just such physical signals for *Paramecium spp.* are possibly come from other mechanisms, therefore not respond to a clock. (This is not due to our selection of vibration frequency; it is due to water body characteristics.) Actually, the major difference between *in vivo* cells and our *in vitro* cultured cells is still the oscillation differential frequencies. Therefore it is almost impossible to culture some of the challenging cells, such as hematopoietic stem cells, since we can’t supply the differential oscillation frequencies they required. Such “incapable of supplying” is due to above water body characteristics. We can’t make a series of “water differential surfaces” inside the water body, and *in vivo* blood vessels do supply many “physical striking differential surfaces” for them. Such kind of surface can get differential oscillation frequencies inside and outside the surface like semipermeable membrane separates chemical ingredients inside and outside the membrane. As we mentioned before, Le Châtelier’s effect includes chemical and physical parameters and equally applies to them to follow the least action. The above white water membrane could be regarded as the primitive forms of semipermeable membranes. The fundamental functions of diverse membranes are to procure physical parameter differential effects. From here we could understand bio membranes are physically originated on water surfaces, no matter simple or complex.

Our initial concentration is around 50 cell/ml, after one week, CK group without physical strike finally gets 5.2×10^4 cell/ml, treatment group with persist physical strike from a mechanic clock attains 2.2×10^7 cell/ml, Negative CK are placed in some environment with treatment group and got the same mechanic clock strike, however, due to we artificially damaged their zygote physical oscillation collection structures (Note: we never damage the zygotes, only damage the extended white membrane), a white membrane on water surface, the final cell counting are the lowest among all, even lower than the CK which not get physical strike. This reveals that a physical strike is vital for their reproductive structures. Just one small white membrane can make the CK and treatment group get a difference of 10^3 cell/ml discrepancy. With other conditions almost the same, artificially damage the white membrane is enough to decrease the final cell counting in 7 days for 10^4 cell/ml level.

This experiment also reveals that the fundamental functions of biomembrane are to acquire differential oscillation frequencies on the different sides of the membrane. Such functions are more prior than those of the chemical separation. Later, bio quantum paths will be used to modulate a membrane, need such a concept.

Supplementary Experiment 6 | Gravitational difference between living plant source organisms and their blending damaged state. (Avian eggs are from an animal source, due to take blending method the data are put in here) [▲](#)



Legend says that Isaac Newton watches an apple fall from a tree, and then perceives his Law of Universal Gravitation. Now we first take apples for a bio gravitational test. The experiments are simple, just tare a blender container, put fresh and complete targets in the blender container and get fresh weight, and then weight again after blending. If we want to get correct “gravitational loss” for such kinds of experiments, fruits or vgs better be freshly pickup, no fridge, no bruise or cut, can’t be peeled, also don’t remove

the pedicels, etc. All such handlings will impact the results. For control, we just cook the apple in boiling water, kill every cell of the apple, wipe out the water and do the same experiment. We could easily see, 1.29% gravitational loss is only effective for alive apples. Once we boil all the cells of the apple, the gravitational loss is not presented again. It will be no problem for us to verify the law of gravity in such a way, just assure no operational losses such as air leak, water evaporate, tissue loss, etc. The bio-inertia estimated in this way needs to damage the structures of organisms; therefore, can only be applied in some areas such as the food industry to evaluate the freshness quality of a sampling food. The physical strike method we mentioned before can get *in vivo* data; therefore, can be utilized in medical sciences. It's not only a training method but also a reliable health condition calibration method.) The results of this experiment and the next experiment show that the gravitational loss of a living being reached 0.14-3.8% of the measuring weight. That means the gravity has been enlarged for 10^9 in bio-systems than those in historical Cavendish experiments for non-living beings. (We could perceive what is a "10⁹ enlarge" from a real case. China has the largest population in the world, around 1.3 billion people. If the average body weight of everyone in the country is $W_{\text{individual}}$, then one people's average body weight $W_{\text{individual}}$ compare to the total body weight W_{total} of all 1.3 billion people in the country is enlarged by 10^9 . When the first time I got the correct method after so many failures for trying to put animals on a generic Cavendish device, I was so astonished to believe myself. Bio-systems are definitely not a "black hole" model in physics, how they can hold so much gravity? To avoid any possible mistakes, I personally repeated above gravitational difference experiments again and again, in three provinces of China, Bangkok of Thailand and Ontario of Canada for years with more than one thousand plant source samples from wildness and human cultivars, and more than one hundred animal source samples from wildness, laboratories, and markets at different seasons, the data are firmly standing on 10^9 levels. The data in the tables are just small fractions; for all the experiments, the gravitational losses are absolutely presented, and all results are fallen into the range of the selected data. This means that these experiments are much more general to be performed by almost all species on Earth. We just need to note, for non-living beings the difference between gravity and mass is quite small on Earth; "big G" which refers to the data on different locations of Earth, only shifts very slightly (<5%). Such a minor shift is still within G's level (10^{-11}) thus can never be measured by an ordinary balance. However, for living beings, that method is feasible.) For the reason why so huge gravity can be fixed in bio-systems, I exhausted all my mental efforts for five years and finally realized it was the bio quantum paths of diverse levels that hold so much gravity. Albert Einstein has written down $E = mc^2$ for the rest energy of an object. However, that is energy based on mass calculation. From the fact that there are 10^9 levels of gravity enlargements in bio-systems and bioenergy is non-transferable with all the other types of energy, this formula is not fit for bio-systems. It is not difficult to understand that along with diverse factors such as health condition, age, etc.; gravity loss should correlate with species; advanced species should averagely have more average gravity loss than lower evolved species under the new-born conditions. Also, gravity loss correlates with the environment. The plant grows with soilless culture, or chemicals will be lower in gravitational loss per fresh weight unit than those grown in soil for the same tissue. For holistic constant K, it should be available more than one kind of method to get the curves in (Fig.1b); measuring gravitational loss is the best one due to it can be regarded as empirical bio-inertia.)

Gravitational difference between living plant source organisms and their blending damaged state

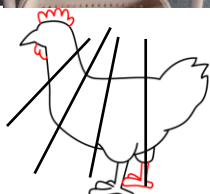
	Fresh weight	Weight after blending	Gravitational loss
apple	249.57	246.34	1.29%
tomato	237.42	235.18	0.94%
kiwi fruit	228.63	225.14	1.53%
onion	253.13	250.39	1.08%
pear	278.61	275.89	0.98%
garlic	169.37	166.23	1.85%

potato	315.23	312.17	0.97%
strawberry	251.45	248.74	1.08%
lemon	279.33	275.85	1.24%
mung bean sprout	255.41	253.17	0.88%
fertilized egg unhatched(leghorn) *	49.25	49.17	0.16%
fertilized egg hatch for 1 day(leghorn)	50.11	49.97	0.27%
fertilized egg hatch for 20 day(leghorn)	42.41	40.78	3.84%

* For fertilized avian eggs, possibly due to gravitational loss is mainly coming from blastoderms; therefore, the result is relatively lower. However, once hatching, the gravitational loss will be accumulated. This reveals that growth and development include the process of gravity binding. The species in this and the next experiment not fully perform DNA identification since accurate species are not important in such kinds of experiments.

Supplementary Experiment 7 | Gravitational difference between living animals and their dead states ▲

For animals take the blending method to get a gravitational loss is too cruel, so we use a normal mercy-killing. As in the figure, we first tare weight a plastic box, gloves, scissors, a syringe with anesthetic drugs. (Pentobarbital, 200mg/kg is laboratory euthanasia dosage. Comply with Tsinghua IACUC code; all the mammals use 20-30mg/kg low dosage to make them less active and get fresh weight, then use a higher dosage to euthanasia the animal, after that cut the body along the spinal cord into 3-5 pieces as in the figure. For non-mammal animals, IACUC rejects to issue administration. So if they are not struggling to impact the acquiring of fresh weight, then don't use it. I have used more than one hundred different animals; around half of them not use the drug. Then there



cut roughly along lines

is no need to tare the weight of the syringe.) After tare and get fresh weight, kill with the scissors, still cut the body along the spinal cord into 3-5 pieces. (This is to save time. If we only kill the animal and not cut into pieces along the spinal cord, the detectable gravitational loss needs 20 min to 90min to be fully released. Cut along the spinal cord can quickly release most of the gravitational loss which enough for our experiment. All the operations inside the box with cover, then all the detachments such as blood splashes are all inside the box or on our tools. After cutting, then weight the box with all the gloves and tools. (This is to recover the weight loss from blood splashes, meat, etc., all these losses are attached on gloves and tools.) And the method of cutting the spinal cord to reduce the time requirement is only adapt for vertebrates, if we want to get the gravitational loss for invertebrates, such as those from Mollusca or Insecta, we probably still have to depend on the previous blending method.

Gravitational difference between living animal source organisms and their structure damaged state

	Fresh weight	Weight after killing	Gravitational loss
Cat fish (<i>Clarias fuscus</i>) (market)	324.7	318.2,	2.00%
Carp (<i>Crucia</i>) (market)	335.4	327.1	2.47%
Tilapia fish (market)	626.4	619.7	1.07%
Perch fish (market)	826.5	804.7	2.64%
Chicken (lab, day 1,leghorn)	29.42	29.32	0.34%
Chicken (lab, day 10,leghorn)	50.39	50.02	0.71%
Chicken(lab,4 weeks, leghorn)	238.2	232.6	2.3%
rat (lab, wistar)	218.6	214.2	2.01%
mouse (lab, 4 weeks, Balb/C)	21.4	20.8	2.8%
house mouse(trap from wild)	21.6	20.3	6.0%
hedgehog(trap from wild)	429.4	408.7	4.8%

DH5 α (lab) *	1.057	1.048	0.85%
M16 tumor cells (lab) *	0.321	0.319	0.62%

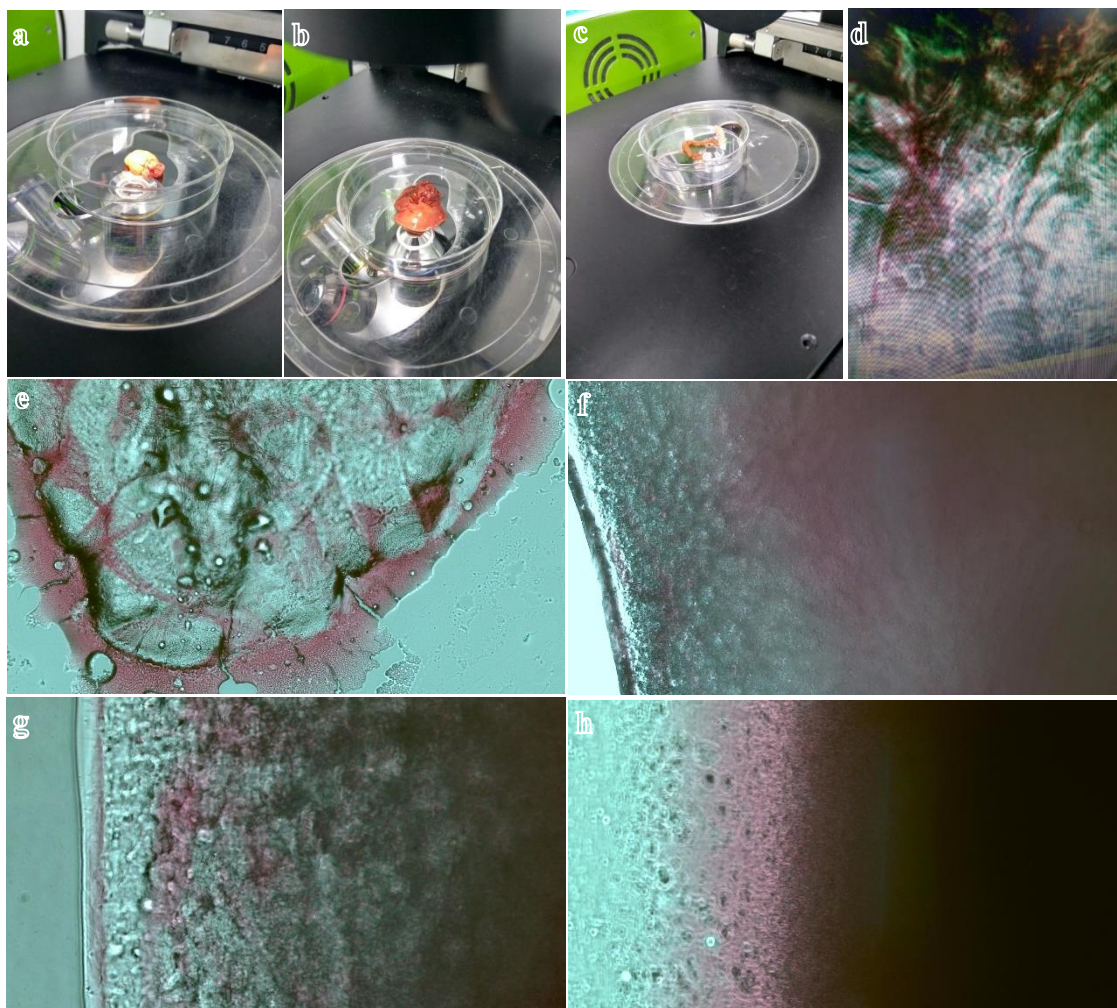
* DH5 α is a genetic engineering bacterial carrier, PDA (Potato Dextrose Agar) rotary shaker culture. M16 is a kind of human tumor cell which not growth adherently, culture with DMEM, therefore no trypsin or collagenase needed for collecting cells. The method for measuring cells just takes one empty 15ml centrifuge tube with cap, one pipette tip, and one EP tube of crystal violet solution (add some Gram staining iodine solution), then 800 rpm to collect cells from suspensions in the centrifuge tube to get fresh weight, use the tared pipette tip to manipulate cell and add crystal violet to kill the cells, then weight again. Centrifuge cap, the empty EP tube for crystal violet, and pipette tip also need to be weighted. (For M16 cells, the gravitational loss is quite unstable, not only at a quite lower level and also around half of the tests can't detect any gravitational loss. For plants or animals, it easily gets a gravitational loss since we can visually choose a sample in a relatively active state, and without a flaw. For cells, it is difficult to visually select samples. Also, routine cell technologies such as centrifuging, PBS washing, re-suspension, etc., are still damaging to the cells. Beside such technological problems, we also face methodological challenging: We yet can only measure the gravitational loss of an animal, empirically can never measure the gravitational loss of an anatomical separation such as a leg or a wing from an animal, how we here can change the rule to measure that for separated cells? (For an animal, a cut leg with dripping blood is continuously evaporating gravitational loss, not feasible for such measuring. For isolated cells, the process of applying trypsin or collagenase could equivalent to cutting a leg from the body. The human culture of the cell line is also a process of losing gravitational loss.) However, even with such methodological challenging, we still should understand the significance of such measurement. Unless we can totally give up all cell technologies from our world, we'll definitely need the measurement of gravitational loss for cells or a single cell sample. It is a quite reliable method for measuring living or dead cells, quantify the age of cells and bio-inertia. Also, if we want to know whether a gene or cell deliveries are inheritable, the gravitational loss could possibly offer the sole reliable judgment. As mentioned before, for gene interference, only after delivery, the gravitational loss of the target reaches a certain threshold, then it can be inheritable. For cell delivery, to avoid some negative side such as "stem cell delivery inducing cancer", we also need a gravitational loss threshold for prevention. "Gene inheritable" bio-inertia standard should empirically equivalent to "stem cells not induce a tumor after delivery" bio-inertia standard. The controversial GMO food possibly can be simply resolved in a way with a gravitational loss threshold. Without enough gravitational loss means that gene or cell deliveries not compatible with the gene or cell of the delivery targets and even possibly induce negative problems. The measurement of gravitational loss is so cost-effective and operational convenient than those of conventional DNA, RNA, epigenetics and chemical tests, etc. Actually, not just cost-effective and operational convenient, none of the known above tests are capable of measuring bio-inertia. (Immunological measurement is a little bit closed to but actually not bio-inertia assay. Diverse immunological methods test the xenograft specificity and can't get an immunological potential for issuing such specificity. The only way to get immunological potential is still the gravitational difference. Acquired immunity must depend on tightening δK for functioning. Simply, gravitational binding = immunological capacity = recovering capacity.)

Supplementary Experiment 8 | Fresh observation of cell migration from mouse small intestine, liver, and brain, to estimate the rough time-elapse of gravitational loss in a bio-system (with an 18-week mouse, Jackson 003291 - C57BL/6-Tg (CAG-EGFP)10sb/J) .

Cell migration needs a quite higher bio-inertia for maintenance. So we suppose if cell migration is in a regular pattern, the host still can hold a substantial amount of gravity. Here we find a method that can directly observe cell migration patterns; therefore, we can roughly estimate the time-elapse of bio-inertia after a bio-system is damaged.

Method:

Use an ordinary inverted microscope, routinely euthanasia animal and fetch the mouse organs directly into a Petri dish put on the microscope stage and observe freshly. The whole liver not breaks the surface membrane and directly observes the brink of the liver lobe. The small intestine has to be cut into segments; any part of the small intestine can be seen clearly. The brain can only be partially watched; however, remove outside tissues, then the hypothalamic-pituitary region can be watched clearly. For organ which cuts into segments or broken surface membrane, cell migration can be only last for 2-3 hours. For the entire liver with a complete surface membrane, the cell migration can be active for more than 9 hours. (Some time we can spray some distilled water if find wither of the surface. The time record here is while the cell migration pattern is still kept rhythmic (refer to **Suppl.Movie 2**), and before finally stop the observed cells still have 6-12h of irregular cell migration, which similar to Brownian motion. Such irregular motion reflects that bio quantum paths have been collapsed. In animal gravitational loss measuring experiments, after cutting the animal along



(a) fresh mouse hypothalamic-pituitary on microscope stage (b) fresh liver on microscope stage (c) fresh small intestine on microscope stage (d) small intestine with $\times 40$ objective (e) small intestine with $\times 10$ objective (f) liver with $\times 20$ objective (g) liver with $\times 40$ objective (h) brain hypothalamic-pituitary region with $\times 40$ objective.

the spinal cord for 3-5 pieces, the detectable gravitational loss will be released in about 5min. Without such cutting, the animals need 20-90 min to fully release the detectable gravitational loss in diverse cases. From this experiment, we could know that the actual gravitational loss elapse-time will be much longer than 90 min since after blood circulation is arrested, the organs we freshly observed still can get very rhythmic cell migration patterns. Such a rhythmic cell migration pattern is definitely in a state which still holding substantial bio-inertia or gravitational loss, just can't be measured in our simple ways. 10^9 levels of gravitational loss really need a longer time to be fully released after the animal is killed. Our method is just an application that can quickly find most of the detectable gravitational loss, not an accurate measurement. However, it is still enough to define the "gravitational difference" as "empirical bio-inertia". It is estimated that most of the gravitational losses by our method are from z dimensional oscillations or structures. From this experiment, we can also understand some of the "fashionable ideas" such as 3D print a human organ for transplant or artificial meat for consumers are totally unfeasible. Suppose we can culture large quantities of cells and also pile them together by a fashionable 3D printer. However, what shape the 3D printed organ or meat are Newtonian forces and not bio quantum paths, no "growth Le Châtelier's processes" involved or no Principle of Least Action is followed; therefore, they can't bind any gravity. Compare with natural bio-products with 10^9 levels of gravity binding, they not only fragile to lack biological functions and can't be used for any organ transplantation, even as food will be taste very bad. Human taste is based on bio-inertia or gravitational binding instead of conventional nutrient stories.

Supplementary Explanation 3 | Experiments for verifying inertia mass VS gravitational mass in bio-systems Δ

Legend says that Galileo Galilei has dropped two cannonballs of different masses from the Leaning Tower of Pisa to show that their speed of descent was independent of their mass. One of the famous experiments to indirectly reveal that inertial mass is equal to gravitational mass. However, modify this experiment can get a different result. We can make two empty metal balls with the same shape (avoid different air friction), both with a motor connected to a flywheel fixed in the central axis and link to a battery and switch inside the cavity; switch one to make the flywheel rotate and another not. Drop these two devices from a height we could see the difference of time which they hit the ground. From here, we could understand that legendary Galileo's experiment required there is no relative mobility from the different parts of the cannonballs. Once such a premise breaks, part of the gravitational potential will be shifted to kinetic energy to retard the fall of the cannonball. We should note that in this condition, it is not the difference in weight of cannonballs that makes the difference of hitting time on the ground. It is because gravity is partially shifted by the flywheel to other directions. This is a preparation experiment to find the hidden premise of legendary Galileo's experiment. For an animal such as a cat, later we'll see that most of a living being is composed of bio quantum paths. Such paths can shift the gravity greater than a flywheel we used in our preparation experiment, and the heart is still vigorously beating, which also shifts part of gravity; thus we can get a difference in the speed of fall. We also can make a model cat with the shape, density, and fur equal to a living cat (this way is to avoid the difference in air friction, and inside the model cat everything is fixed), then drop from a height we then can see the difference of time to hit the ground. (A cat drop from three to four stories will not be falling to death, and it will vigorously turn its body in the air by the law of conservation of angular momentum, a little bit like the ball with flywheel inside then randomly oscillation in falling direction.) From this modified experiment, we could further know the hidden condition of inertia mass equal to or in proportion with gravitational mass. Eötvös experiment consisted of two masses on opposite ends of a rod, hung from a thin fiber with a mirror. The premise which controls it is still the same as that of legendary Galileo's experiment. We also can make empty balls with flywheel and motor inside to get such a difference. In summary, an inertial mass equal to or in proportion to gravitational mass is only happening in a condition in which the inner mobility of an object can be neglected (such as a "quasi-rigid" body). For an object with persisting inner relative mobility or oscillations, the effect of conservative force gravity and a non-conservative vector force act to the system is quite different. For this reason, inertial mass and gravitational mass are totally different in bio-systems due to inner "splicing" processes. Actually, Albert Einstein's emphasis on inertial mass VS gravitational mass was quite different from his pioneer Newton who didn't pay much attention in this point at the start since he needed that conclusion for initiating his theory; however, following his final equation in a curved space, it is still difficult to use one single acceleration to neutralize the gravity on each locality. This means that inertia mass equal to or in proportion to gravitational mass only happens in locality instead of astronomical range even for non-living beings. For bio-systems with 10^9 bindings of gravity, above astronomical range discrepancy is superposed within a small-scaled *in vivo* range.

Supplementary Experiment 9 | Reduce the activation required time for avian egg pecking behavior by conservative forces from water wave (Verify that life is mainly composed of bio quantum paths, critical steps in development such as pecking behavior are driving by conservative forces or signals.) Δ 

Bio quantum path is quite challenging to completely engineer in the laboratory like diverse other Newtonian mechanics experiments since we need a large resonating system to structure a small bio quantum path. (The

experiment in (Suppl. Movie 3) is just part of a stretched bio quantum path for demonstration mechanisms. If we want to engineer a bio quantum path with a theoretical structure and to run a ball on it, we need the side rails shown in the figure to enclose the ball are necessary. Mechanical rails can't splice frictions; we then have to use an extra magnetic field or something outside the system to assure the experiment. This means a complete bio quantum path only exists in living bio-systems; in there, it can splice out resistance from all directions. It is too challenging for a mechanical laboratory to engineer a device to splice out frictions from more than one direction. In contrast, a real bio quantum path in the bio-system can splice out frictions from every direction.) A hatching egg is a good laboratory target for a complete bio quantum path experiment; just need some of our imagination for the theoretical structure of a bio quantum path to understand all the experiments from (Suppl. Exp. 9-12).

For an avian egg, no matter how it is placed, the hatching baby always pecks along 2/3 height horizontal plane close to the air chamber blunt end, sometimes due to the position of the egg, the pecking plane could be slanted to a small angle. Without pecking down a whole cap of eggshell, the baby has to wait for death. The embryo always takes the folding posture in the photo to move around 180 ° to peck a whole eggshell cap. This "cap" takes around 8 to 36 hours to finish in our lab. We only record the time of the first pecking hole in the experiment. The location of the pecking plane and the whole process are definitely controlled by holistic bio quantum paths.

Method:

For normal hatching eggs candle and pick up alive 20-21 day's hatching eggs with sounds but without pecking (chicks generally begin to chirp inside an eggshell for around one day before hatching out.) and float into 38 °C warm water with, air chamber on top, slightly stir the water for the eggs to shake with the water wave, keeps the wave, if an egg begins to responsive self-movement, then no needs to offer manual wave (In most of the conditions, water wave could arouse pecking within 20s.). Records the percentage of pecking within 10min, E.g. 24 of 30 eggs can be activated by water wave within 10 min are recorded as 80%. CK1 group inside an incubator needs the same temperature and other conditions. CK2 group is hatched by a Hen. Record time ranges of pecking which attain the same percentage with that of the treatments, E.g., 24 of 30 treatment eggs can be activated by water wave within 10min to reach 80%, then we check the time of CK1, the first CK1 egg is pecked at 3.5 hours, and the No. 24 CK1 egg is pecked at 7 hours, then record 3.5-7. For the treatment group, the time range: 20s - 6 min 14 s is written beside the 80% activating rate. We record in such a way since CK1/CK2 and treatment group are seemed not in the same statistical Gaussian curve. (Possibly statistics needs to find a model for such kind of conditions.) However, we can clearly see that artificial water wave does significantly reduce the activation required time for pecking behavior. Activation required time of 3.5-7 hours from the start till the end of pecking in normal hatching for 24 eggs has been reduced to 20s-6min14s by water wave for the same conditions.

Avian egg pecking behavior aroused by artificial water wave

	30 leghorn eggs	30 B eggs*	30 C eggs*
% of water wave activating pecking within 10 min	80 % (20s-6min14s)	67% (20s-7min53s)	70% (1min7s-4min22s)
CK 1: Lag time of hatching machine eggs	3.5-7 hour	4.5-9 hour	3-9.5 hour
CK 2: Lag time of hen hatching eggs (20 eggs)	2-4.5 hour	NA	NA

(B-eggs: Beijing You Chicken eggs, C-eggs: Five Black chicken eggs, are local breeds, the hen for leghorn eggs is also a local breed. CK1 or CK2 observed every 30min. For hen hatching, we only get 20 qualified eggs.)

These results demonstrated that water wave is much better than any ways, including hen's turning behavior for arousing pecking. Since water wave is a conservative force, hatching machine and the hen's turning egg are not conservative forces; such non-conservative forces need to be transferred into conservative forces by amniotic fluid (or bio quantum paths) for development. From here, we can see another kind of oscillation energy model: Only a slight water wave activated a chicken pecked out a whole eggshell cap and jumped out.

Supplementary Experiment 10 | Activation of hatching avian egg yolk sac homing or reduced the required time for this process by water wave as a conservative force source. (Verify that at tissue or organ level, physical dominance forces are still bio quantum paths.) ▲

Method:

Similar to the above method just open 18.5 – 19.5 day's hatching eggs as (Suppl. Movie 4) which can observe yolk sac homing but no yolk sac homing rhythmic behavior being observed (if hearing sound that means yolk sac homing has been finished then it can't be used, and the egg membrane of which must be completed.), 10 for CK and 10 for treatment group. CK group in normal hatching machine and treatment group floats on 38 °C warm water (some eggs need a disposable cup for floating), slightly stir the water to make artificial water wave, if the eggs begin to move then no need to stir, record the yolk sac homing percentage and lag time as previous (Suppl.Exp.9). Yolk sac homing need take 1-1.5 day for finishing; we just record the first peristalsis movement in the record:

Avian egg yolk sac homing process aroused by artificial water wave

10 leghorn eggs selected as in the method	
% of water wave activating yolk sac homing within 10min (time range)	70 % (1 min 17s – 7min 20s)
CK: Lag time of eggs in hatching machine get same activation rate	2-6 hour

These results demonstrated that water wave significantly arouses yolk sac homing behavior; reduce activation required time from 2-6 hours to within 10 minutes. Yolk sac can attain around 15% of the total weight of a chicken. In yolk sac homing, so large a structure directly migrated from the navel hole into the body and attached to the intestine region. So large a weight means it is definitely organ level physical movement, equivalent to mammals' delivery of babies. It can be aroused by water wave, means it is still controlled by bio quantum paths at this level.

Supplementary Experiment 11 | Percentage of yolk sac weight to the bodyweight of newborn leghorn chickens (Verify that the functions of yolk sac homing and mammalian milking are to supply gut bio quantum path z oscillation “splicing” patterns for digestion.) ▲

Method:

Weight the newborn chickens once their hair is dry, and then surgically get the entire yolk sac and weight.

(gram)	1	2	3	4	5	6	7	8	9	10	AVE	STD
body	37.28	34.94	38.13	35.66	34.28	36.67	35.14	39.04	34.35	35.63	36.112	1.617
yolk sac	5.18	4.46	6.22	5.06	4.74	6.13	6.84	6.45	4.97	4.85	5.49	0.8347

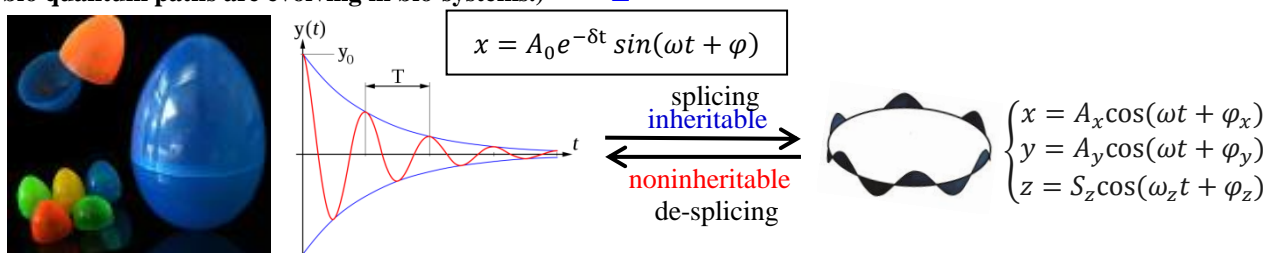


a) avian yolk sac from a navel hole (arrow) migrates into the body and attached to the gut region b) this embryo failed to home its yolk sac and die, we can see the size of the yolk sac. The data in the table come from 10 newborn leghorn babies c) open the eggshell to monitor yolk sac homing, just use a sharp tweezers knock on the blunt end of the eggshell for a small hole around 0.5×0.5 mm, then along this hole use the sharp tweezers gradually peel off small eggshell chips to get a large observation window, avoid damage the egg membrane (Suppl. Movie 4) d) 9 sketches and 1 photo for human embryonic development, yolk sac homing happens in 9th week and finish in 11th week, at 9th week the baby will open the eyes, show a V-shaped blood vessel cluster (in the figure) on skull and yolk sac homing starts, from 10th week the eyes will then close till the 40th weeks to open again, yolk sac homing will finish in 11th week, it takes 2 weeks in human being, around 1/20 of the total 40 weeks pregnant period, similar to avian which takes 1-1.5 days to finish yolk sac homing in a 21 days hatching period,

and in 11th week while yolk sac homing finished, the tooth buds of human baby begins to present, at 9th week human embryo is around 2cm, 2g, and at 11th weeks while yolk sac homing finishes, it suddenly boosts to 4.3cm, 7.9g in two weeks' time. Yolk sac homing should be a gravitational binding process, we can write: After yolk sac homing ($W_{\text{body}} + W_{\text{yolk sac}}$) > before yolk sac homing ($W_{\text{body}} + W_{\text{yolk sac}}$). Just need some method to measure such a gravitational binding shift.

The fundamental functions of avian yolk sac homing are to supply gut digestive “ground splicing state” bio quantum paths. (In humans and mammals, such functions are directly replaced by lactation.) For newborn babies, yolk sac with the 15% of body weight gradually mixed with outside food and followed with the Le Châtelier's effect under gut peristalsis movement. Therefore, the food ingredients which after digest can distribute maximum with the yolk sac contents will get absorb priority. What animal absorbed from foods are “spliced” nutrients with enough oscillation or surface tension regions, not just the simple nutrients claimed by conventional biology.

Supplementary Experiment 12 | The fundamental functions of bio quantum paths are to transfer non-conservative forces or signals into conservative forces or signals (Reveal the prerequisite conditions for constant k binding and how bio quantum paths are evolving in bio-systems.) Δ



Method:

30 avian eggs in hatching machine with 45 ° turning egg set up as the control group. 30 eggs are standing with air chamber upside in hatching machine without turning eggs as treatment A group. Treatment B group composes of 30 eggs same with A group but after 14 days (embryo near full the space and the fetal movement is beginning to be constrained) then move into a disposable plastic cup floating on water bath, keep the air chamber upside and the temperature of the water bath is the same with hatching machine to be set up as 38 °C. Eggs can't be soaking in water for a long time since they need respiratory; therefore, floating inside cups is necessary. If there are available round-bottomed toys as in the figure that will be better, for the egg movement will be easy.)

Avian egg floating hatching experiment

	Hatching rate
CK: 30 eggs in hatching machine with normal turning (38 °C, 65% RH, 45 °turning/2h)	93.3% (28/30)
A: 30 eggs standing with air chamber up and never turning in hatching machine (38 °C, 65% RH)	46.7% (14/30)
B: 30 eggs same with treatment A for 14 days and then move to float on a water bath (38 °C)	90.0% (27/30)

The hatching machine turning eggs will double the hatching rate for avian eggs. Without turning eggs, half of the embryos could not be hatched out. The physical force treatment B group gets the same with treatment A for 14 days; after that time, this group removes to the water bath, which the eggs still in static status. The only difference is that in the water, while the embryos are moving, their tiny behaviors can get water wave response. Such a response effect means a tiny movement can get enough response. And for standing egg group A, they actually need quite a large movement to get the same response. The “recovery capabilities” of each behavior is different. Just such a difference without the outside turning eggs' help, the hatching rate quickly recovers back to that of the CK.

From here, we can clearly see how Le Châtelier's Principle or Principle of Least Action can govern the evolutionary constant K binding processes, and the essential characteristics of bio quantum paths are still a “responsive recovery” effect. Fundamentally, chicken's behaviors inside an egg, no matter small or large action or at which part of the body, are definitely binding by every part of the body. If one action can't get the full responsibility of every part of the body, it will be tried to increase till attaining a Le Châtelier's effect. Once it can

get the response of every part of the body, it will then reduce to least amount and fix this behavior unless a new adjustment is needed. Therefore every behavior remains the least threshold instead of a higher threshold. The evolution of Amniota is definitely for strengthening the least action or the bio-inertia. For treatment A group after 14 days, due to the growth of the baby fully occupies the egg, the function of the amniotic fluid for strengthening the least action is gradually checked. Therefore without turning eggs to strengthening the functions of the amniotic fluid to keep the least action, the development will be influenced, and half of the eggs can't be hatched out. For treatment B group, after 14 days albeit they still not get turning egg help, floating in water has largely compensated for the functions of amniotic fluid to keep the least action, their tiny actions can "drive" the movement of the other parts of the bodies or get the Le Châtelier's response, albeit those effects are acquired due to eggs are floating in water, the systems will regard this as effective binding or keep the state same with previous 14 days, therefore the hatch rate recovers back. Actually, not only physical behavior, all the other parameter binding still follows the same process. If any environmental factors or even DNA, RNA, cells, etc., can be binding into constant K , the prerequisite conditions are still their interventions are not disturbing the internal least action environments and also reduce the thresholds for certain actions to involve in Le Châtelier's effects. Like eggs in treatment B, their tiny actions can get the whole body response no matter this is due to float on water or the help of the mother; then this action will be fixed and then continuously reduce to a lower threshold. As in this experiment, treatment B can bind nearby parameters if any of them satisfy the above conditions; and for the survivors of treatment A, since their movements were not in the least action states, so bindings need higher threshold than those in treatment B. In the experiment we usually find almost all the embryos know how to "play a swing", as in the figure there is a damped oscillator (Damping ratio $\zeta < 1$) which period or amplitude gradually is gradually decaying under resistance, play on a swing take a reverse process that the amplitude or period is gradually driving by an outside small periodical force instead of a sudden force. The baby chicken inside the eggshell naturally knows how to use a tiny action gradually increase the amplitude and finally get a satisfying vibration. This process seems quite general in the animal kingdom, not only chicken; diverse animals include human babies always know how to try something without any study. Such a trying process is taking the above "play on a swing" behavior. Such behavior is possibly a "naturally without learning Le Châtelier's process", which naturally present in all bio-systems. Definitely, all the bindings take bio quantum paths instead of Newtonian forces for "binding" together, and what binding together will suffer continuous Le Châtelier's modifications. This is how bio quantum paths evolved; first from a reversed damping vibration gradually attain Le Châtelier's threshold, then "splicing" the resistance and result in a roughly equal amplitude or period and fix down. (For any damping vibration, the after "splicing" amplitude or period will compromise to equivalent for a substantial amount of period.) The whole process is demonstrated in the figure.

From this experiment, we can further understand the inheritable question which we have discussed before. The inheritable gene(s) are definitely those fit the Principle of Least Action or bio quantum paths quite well under certain environmental conditions (bio quantum path oscillation in the figure). And the easy-lost-gene(s) on a genome are those not fit the principle well compare with inheritable genes (damping oscillation in the figure). Persistent Le Châtelier's modifications give different weights for the stability of every gene(s) resides on a genome. So what finally decides inheritable or non-inheritable segments is their oscillation state or gravitational binding on the genome. And such oscillation is coming from all the correlated functional parts in the system instead of just a local oscillation. As we see in Le Châtelier's equation, physical processes and chemical processes are actually inseparable. Therefore, the more activities of the chemical reaction certain gene(s) involved, the more physical oscillations it will possess. Turning egg does activate a lot of chemical reactions and is critical for the hatching.

Supplementary Experiment 13 | Gravitational loss of avian sexual behavior (Verify the quiddity of sexual behavior is the inversion of three-dimensional oscillations and will induce a gravitational loss.) ▲

Method:

Choose over 18-week normal leghorn roosters with sperm counting over $3.0 \times 10^9/\text{ml}$ (leghorn roosters generally mature in 16 weeks, however, at start they can make coitus but no spermatozoa inside the semen; so need to check to assure), separate with hens for at least one month, tare a large plastic bag, a pair of gloves and a semen tube, semen tube need warm to around 37°C and rooster can't feed anything within the four hours before experiment to avoid excretion, then put the rooster into the plastic bag, then get fresh bodyweight, After that take avian artificial insemination technology to collect semen, then weight the rooster again, (the plastic bag is to collect hair, or something fall from the rooster while operating, so after collection we still need weight the plastic bag and gloves again to adjust the bodyweight of the rooster after ejaculation), generally after 5min of sex the result will become stable, in such way we can get the gravitational loss for sexual behavior.

Gravitational binding loss of a rooster in the sexual behavior

leghorn	rooster 1 (18 weeks)	rooster 2 (19 weeks)	rooster 3 (22 weeks)
W_{body} before ejaculation	1723.031	1821.029	1947.172
W_{body} after ejaculation	1721.685	1819.010	1966.686
weight of semen	0.322	0.642	0.815
Gravitational loss	1.024	1.287	1.671
Gravitational loss / W_{body}	0.0594%	0.0706%	0.0837%
Gravitational loss / W_{semen}	3.18	2.00	2.05

From the results, chickens lost around 0.06-0.08% of gravity after sexual behavior. This loss definitely comes from the loss of commutation relations on dimensional oscillations which compose the actual time in bio-systems. For non-living beings, time is actually human's knowledge of correlations which has not concerned with research targets' age or no commutation relations with other dimensions. However, in bio-systems, the time refers to the sequence of the binding of gravity; therefore, it possesses commutation relations. Sexual behavior directly inverts such commutation relations or gravity binding and gets pleasure. (In a non-living system, imaginary time can be presented, which drives people to seek dark matter. In a living system, imaginary time is actually a process of losing time in sexual behavior.) Following our model, this experiment should be very general enough to be performed by all species on Earth, albeit the range of data will depend on many factors. It is lucky that the gravitational loss of sexual behavior still can be detected by an ordinary balance and no need for a Cavendish torsion balance. From the data, the gravitational loss of sexual behavior is around 4% with that of the death gravitational loss we measured before. For 10^9 level of gravity binding in bio-systems, around 4% will be lost in one sexual behavior. The refractory period is possible for recovery such a gravitational binding. And possibly due to such recovery can't be fully symmetric, occasionally the Coolidge effect will present. This is also evidence of the time dimension in Eq. (15). Also, we could estimate from Le Châtelier's effect, as mentioned before any process K should be a constant as follows:

$$k_{\text{sexual behavior}} = \frac{\text{body weight}_{\text{after sex}} \cdot \text{semen weight}_{\text{after sex}}}{\text{body weight}_{\text{before sex}} \cdot \text{semen weight}_{\text{before sex}}}$$

The item $\text{body weight}_{\text{before sex}} \cdot \text{semen weight}_{\text{before sex}}$ should be a fixed number; thus this formula could be transferred to, $\text{body weight}_{\text{after sex}} \cdot \text{semen weight}_{\text{after sex}} = \text{constant}$; therefore, we could get the empirical result. Even bacteria exchange of plasmid is likely accompanied by a gravitational difference, albeit that process is a limited sexual behavior that only exchanges genes less than 5% of the total genome. (Normal sexual reproduction exchange 50%.) For bacteria we get:

$$k_{\text{bacterial limited sex}} = \frac{\text{frequency of genome}_{\text{after conjugation}} \cdot \text{frequency of plasmid}_{\text{after conjugation}}}{\text{frequency of genome}_{\text{before conjugation}} \cdot \text{frequency of plasmid}_{\text{before conjugation}}}$$

Therefore, $\text{frequency of genome}_{\text{after conjugation}} \cdot \text{frequency of plasmid}_{\text{after conjugation}} = \text{constant}$

(From the blue colored equations in this explanation, we could clearly see how constant K for is evolved.)

We lack human data for this experiment just due to I can't find a scale that can both measure the human body weight range and also can touch 0.1 gram accuracy. It is quite challenging to find a balance that can both measure a large weight and also has enough accuracy. (Even the balance in this rooster experiment takes me years to finally obtain.) Now we have to utilize the data of chickens'; just suppose the gravitational loss of human beings after sex will be around 2-3 times as that of semen weight. According to the World Health Organization, the typical volume of climax for men is 3.7ml; therefore, the gravitational loss will be around 7-10g. (This is not the weight loss from semen. It is after lost 3.7 ml liquid semen the bodyweight will still disappear 7-10g of bodyweight. That is due to the loss of commutation time or bio-inertia. Historically "time" as a concept has no "bodyweight", Theory of Relative is actually a system that began to weight "time" in physical laws. Quantum mechanics simplifies physical parameter relations into commutations; however, only other parameters such as momentum, etc., possess commutations; time is still mathematically deprived of its commutations. In bio-systems, what we measure is actually the commutation time or time with "bodyweight". Therefore, sexual behavior is a process of losing commutation time. Generally, it will influence on lifespan significantly if not properly handled. From here, we could also understand that "time travel" is only present in science fiction since the time in bio-systems is commutation time which concerned with the environment profoundly. For non-living beings, if technology permits, it can travel high speed around space with only mass shifting and come back. For a living being, such travel not just means the mass shifting, the structure will be damaged due to gravity shifting or commutation time lose and then it can no longer come back with living function, even at a quite lower than a non-living being velocity.) This experiment isn't just evidence for Eq. (13) and Eq. (15) but also create radical challenging for the conventional genetic basis of sex determination and sexual behavior.

Besides physical parameter sexual determination in some lower evolved species, the major parts of sexual determinations in bio-systems are XX/XY, ZZ/ZW, ESD¹, etc., based on genetics. Sequential hermaphroditism occurs in many fish, gastropods, and plants, etc., in which the individual changes sex at some point in its life, either from a male to female (protandry) or from female to male (protogyny)². This phenomenon is difficult to be explained by conventional genetics since shifting fails to manifest relevant genomic changes claimed by the theory. If we regard sex as the physical characteristics of the stationary structure or spinal cord as what ancient people believe in, then sequential shifting will relatively easy to be explained. Cerebrospinal fluid (CSF) surrounds the spinal cord and brain and also into the ventricles of the brain. Modern medical sciences believe CSF is just saline with some functions such as buoyancy of the brain, protection, prevention of brain ischemia, homeostasis and clearing waste from the brain, etc. Due to such understanding, doctors world widely never care about the sampling of CSF and fail to realize its lifespan impacts, even the flow direction of CSF is in dispute. Ancient people thousand years ago still lacked modern scientific knowledge and also didn't something like gravitation binding, CSF, etc.; however, their theories were based on practice, therefore, more closed to the truth even than some of the modern systems. The following model is almost directly transferred from ancient theory, just modify some terminologies:

On the spinal cord, the direction from lumbar to cervical vertebrae is marked as "+" and the reverse direction as "-". Everyone has two directions of CSF flow, for a man at day time mainly takes "+" direction and at sleep mainly takes "-" direction, however, totally "+" > "-" and the younger of the age the more difference of the flow between "+" and "-" direction. For a woman, it is the same way, just at daytime more "-" and at sleep more "+". "+" direction regulates muscular and strength, etc. and "-" regulates curvature and body fat, etc. The "+" "-" ratio manifests the secondary sexual characteristics. (The fact that androgens increase in both boys and girls during puberty, also estrogens are present in both men and women, just at significantly higher levels in women of reproductive age, etc., are support for this model. Outside injection of testosterone to adult men usually get the reverse effect is also evidence of the model since injected testosterone can only change its blood concentration and

can't change the CSF flow direction ratio, which binding so much in the body. Sex reassignment surgery needs long term interference is also due to the stability of CSF flow direction.) However, with the growing of age, both men and women will gradually shift “+” “-” ratio, climacteric is actually a stage which men shift to “-” > “+” and women shift to “+” > “-”. This means sequential shifting is still partially happened in human being. Just because the human structure is complex then only manifests climacteric. Lower evolved species without such a complex structure, the reverse of the physical cycle can manifest real reproduction capability. This could also be regarded as a special type of inversion.

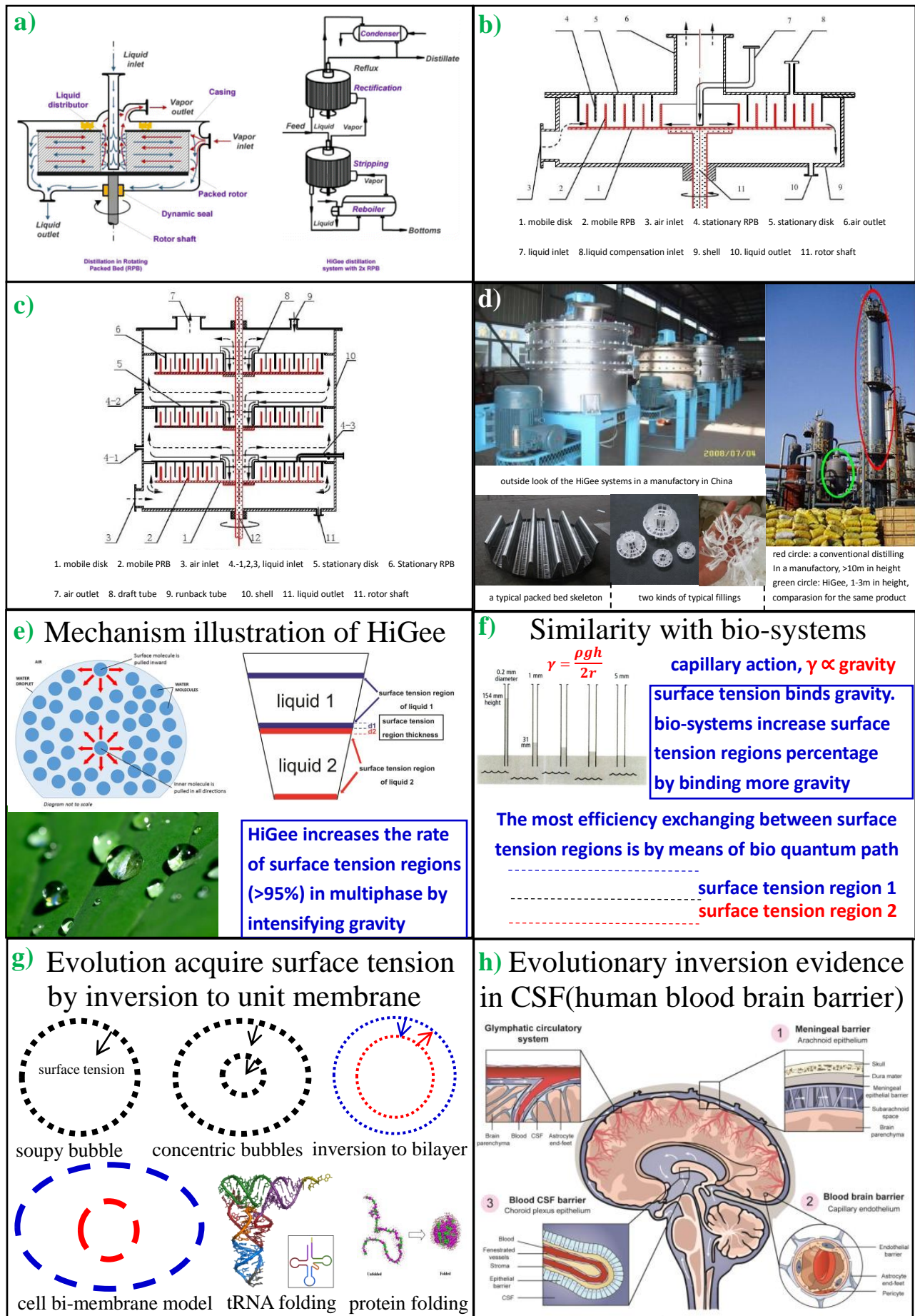
The above ancient model is not just a theory; it has been validated by “sexual control kungfu” for thousands of years. It is the most important kungfu of Wudang; the earliest type was originated from Ancestor Peng (Peng Zu) and later incorporated into Wudang training. From Ancestor Peng (1245 -1100 BCE) to SanFeng Zhang (born in 1247 CE in Fujian province, legend says that he still alive till 1458, we yet don't know whether this lifespan had included some “Taoist self-mummy” stage.) and then to Kunlun Deng (1400 – 1499 CE), it has been over 2600 year. The mechanism of such training is the above model. Besides the above ancient validation, in modern times, we still can further verify. Young people still can be trained in one year for such controlling even if they don't join other Wudang kungfu training. (In Wudang, there are 36 categories of kungfu and the sexual control just one category among them. If a modern man is not too old or in bad health condition, then he can specifically train for sexual controlling within one year. As we mentioned before, life is composed of surface tension regions at diverse level, so sexual organ possesses the highest surface tension regions. Old people's ED problem is due to no enough surface tension regions from the body to delivery to the organ.) Shaolin is a Buddhism sect that absolutely forbidden sexual behavior thus no need for such technology. Wudang needs such technology for keeping the family tie in decades of training, and only while needing a baby then ejaculation. And after ejaculation, people still need specific training for 120 days to compensate for the loss. Now from this experiment, we know the loss that ancient people believed in is the gravitational binding loss. People who loss gravitational binding need a certain time to recover, and the recovery rate is lower than 100%, so people take 120 days of specific training to try to recover a higher percentage of gravitational binding for continuous kungfu training. Because CSF is the highest binding part in a human body, so we can simply say what needs to recover is CSF. (As ancient people's experience, sexual behavior will not impact the kungfu training of women so much but will impact that of men greatly, so they designed the technology to satisfy women and also keep the kungfu level of men. With our modern formula, $\text{body weight}_{\text{after sex}} \cdot \text{semen weight}_{\text{after sex}} = \text{constant}$; we can know that if semen is keeping inside the body, then the gravitational binding will also keep, once the semen is come out of the body, the gravitational binding will lose in certain degrees. It is really curious how people thousands of years ago without any modern knowledge can invent the above controlling technology.)

- Ref** 1. Gamble, T. and Zarkower, D. Sex determination. *Current Biology*, **22**, R258-R262(2012).
 2. Warner, R. R. The adaptive significance of sequential hermaphroditism in animals. *The American Naturalist*. **109**, 61–82 (1975).

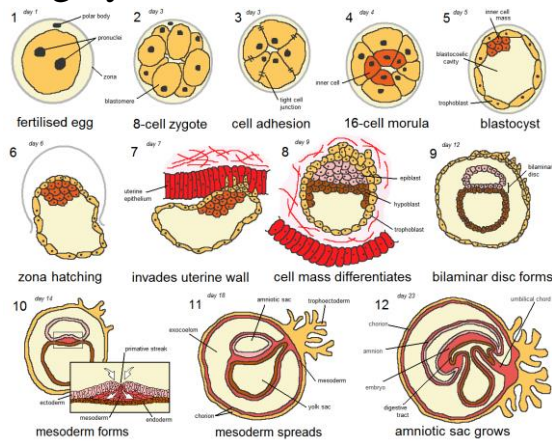
Supplementary Explanation 4 | Industrial HiGee and the urgency of biomedical and lab-scale RPB for the surface tension study of bio-systems from the transferable mechanism between HiGee and bio-systems ▲

In (Suppl.Ani 1), the rotor is the RPB that compose of metal skeletons and filling materials. Two phases or more phases pass it get the gravitational effect. There are more than 30 kinds of industrial used liquid systems such as Methanol/H₂O, Methanol/methylal/H₂O, Methanol/Tert-butanol, trimethylamine/Methyl isopropylamine/H₂O, DMOS/H₂O, etc. The systems can be tandem (Fig.a), or design for intermediate feeding by splitting RPB (Fig.b).

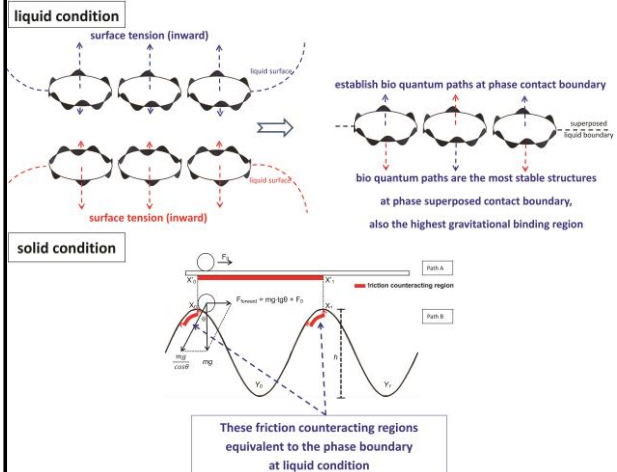
The mechanism of HiGee comes from liquid surface tension. As in (Fig. e), surface tension is the tendency of fluid surfaces to shrink into the minimum surface area; it results from the greater attraction of liquid molecules to



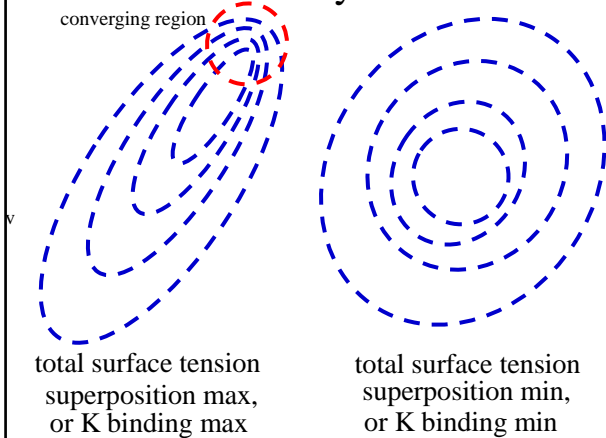
i) (human) embryonic development is driving by surface tension inversions



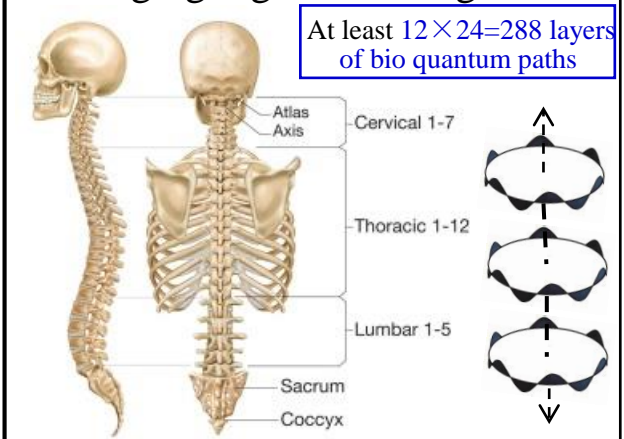
j) Superposition of surface tension



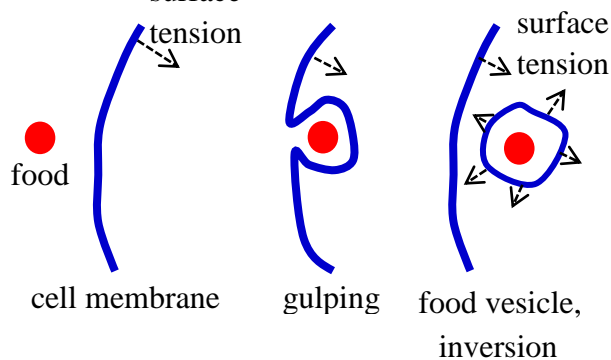
k) converging superposition of multi surface tension system



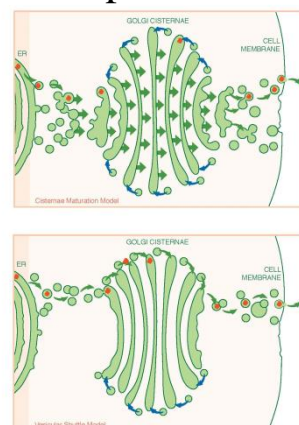
l) spinal cord is developed from the converging regions folding



m) food digestion is a surface tension inversion process, what we need is surface tension from the foods



n) relay inversion process in protein transportation and installation



each vesicle use is a surface tension inversion, diverse derivative structures such as endosomes, lysosomes, etc., are all functioning by relay inversions

a) a tandem of two RPBs b) the earliest HiGee patent was registered by Ramshaw in 1981, it can't feed raw materials in the middle of a process; a new system in China with splitting RPB design solved this problem registered for Chinese as well as US patent c) cascade several such new zigzag RPBs in the same shaft d) on-site HiGee, packing skeleton and filling materials, also compare an HiGee system with a conventional distill system in a Chinese manufactory e) Mechanism of HiGee is to increase surface tension regions by increasing gravity f) Mechanism of bio-system is to increase surface tension regions by evolutionary binding of more gravity g) evolutionary inversion process to establish bio-system unit membrane, a fundamental manner of gravitational binding via surface tension inversion h) the largest evolutionary dynamic inversion structure is human blood-brain barrier h) human embryonic development is driving by surface tension

inversion or gravitational binding i) one layer of surface tension region superposition, under liquid condition as well as solid-state k) converging region of multi-surface tension inversion l) spinal cord is developed from the converging region from the cell or even lower level m) food digestion is a surface tension inversion process, what we need is surface tension from the foods n) protein relay inversion, each vesicle use is an inversion, relay inversion cascade

each other (due to cohesion) than to the molecules in the air (another phase). The net effect is an inward force at its surface. (For mixed substances condition is similar, just the surface tension falls in a certain spectrum.) As in the figure, the “surface tension regions” of two undissolved liquids are very small. The percentage of the surface tension region in this glass of one liquid needs to take the d1 or d2 in the figure to be divided by the whole thickness of the corresponding liquid. HiGee greatly increases the percentage of such surface tension regions; generally, it claimed can make more than 95% of the mixed liquid composed of surface tension regions by higher gravity around 500-1000g. (However, once the machine stops, the high rate of surface tension regions will recover to normal gravity conditions since the surface tension regions in HiGee only on mobile phases and not fixed on certain structures. In bio-systems, due to structural fixation, even for sudden death, the surface tension regions need half a day to retrograde, as in (Suppl.Exp.8). The lifetime surface tension region shifting without damaging the bio-system follows the binding shifting curve in (Fig.1a).)

(Fig. f) validates the surface tension region is the higher gravity binding part of a liquid by capillary action (a special “structure”). As in the experiment, while a tube is larger than 5mm wide, there is no capillary action. With the decrease in the diameter of the tube, the capillary action becomes stronger. Similar to the modulation in the paper, the capillary rise γ of a column of liquid is balanced by hydrostatic pressure, then $2\gamma = \rho gh$:

$$\rightarrow \gamma = \frac{\rho gh}{2r} \quad (\text{neglect the meniscus of liquid})$$

From the equation, roughly the diameter of the tube equal to the two minimum surface tension region widths, then the capillary action is the strongest; or the gravitational binding is the highest. At this condition, after the liquid rising stops, the inner tube will mostly occupy by liquid surface tension regions; similar to HiGee make a higher percentage of surface tension regions by intensifying gravity. (If the tube is too narrow than the width of one surface tension region, the liquid still can't go upward.) This experiment shows the more surface tension region percentages, the more gravitational binding. The 10^9 levels of gravitational binding in bio-systems definitely come from diverse surface tension regions in the system. (Suppl.Exp.6-8) are just some damaging way for measuring holistic surface tension shifting, we damage the structure of the bio-systems, then the surface tension regions are damaged to induce gravitational binding polarization shifting, which reflects on an ordinary balance. It is an indirect way of measuring gravitational binding. From here, the most important functions of capillary blood vessels are to transfer surface tensions or gravitational binding, not just send nutrients or oxygen, etc. Bio quantum paths are the specific and most efficiency exchanging manner between two adjacent or far away surface tension regions. (If two surface tension regions are far away, they need some intermediate surface tension regions for correlation. And the binding signals of such medium surface tension regions tend to a minimum; this is the principle of least action for two far away surface tension regions.) For the constant k in bio-systems, one or a few parameters are coming from a surface tension region; therefore, a holistic constant k will include many surface tension regions.

(Fig.g) shows how evolution binds surface tension or gravity. Soupy bubbles playing by children are similar to the cell membrane in chemical compositions; the surface tension forces are inward and perpendicular to contact surface. It is quite difficult if we want two “concentric bubbles” as in the figure since the surface tension forces of both bubbles are inward; the system will unstable and quickly retrogrades to one bubble. If we make a pore in the bubble, all the surface tension forces are still inward, only on the pore it is outward. The only way to make stable one set of two concentric bubbles is inversion process happens to the inside bubble, then its surface tension forces become outward. As in the figure, the surface tension forces of the blue bubble are still inward while those for the red bubble become outward; then, these two bubbles establish a stable “bilayer”, even if the net surface tension of

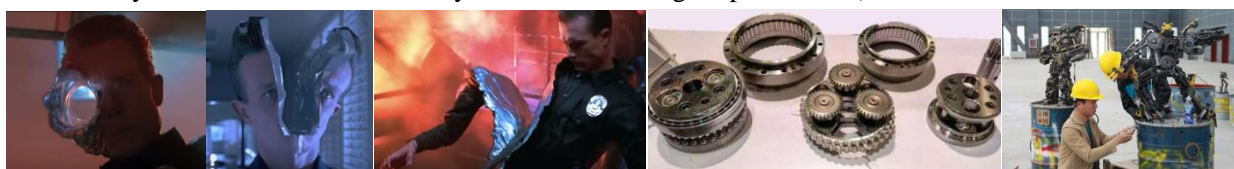
the bilayer still inward. This is the fundamental way of gravitational binding: surface tension inversion. (Inversion here means the reverse of surface tension direction. We just need to know, any happened inversion process has accompanied by gravitational binding shifting. As in the figure, while the red bubble successful “inversion” its surface tension directions, gravitational binding directions also shifted; albeit these two directions are not the same, their changing of direction is the same. We also need to know, all inversion process in bio-systems is driven by gravitational binding.) In cells, almost all membranes are “unit membrane” or bilayer; that is to bind gravity in such a surface tension “inversion” way. (The avian yolk sac homing we experimented before that a large yolk sac equals to 15% of the bodyweight passes through the navel hole is also such a kind of inversion process; this somatic level inversion process is composed of diverse levels of surface tension inversion process which driving by gravitational binding.) The surface tension forces on each side of the bilayer are not symmetric; that is for board correlations with various structures and shifting of surface tension inversion or gravitational binding among these structures. For the “cell bi-membrane” model in the figure, we use the blue color to stand for the cell membrane bilayer and red color to represent the nuclear envelope bilayer. (The surface tensions of both bilayers holistically follow the above pattern, outer layer inward and inner layer outward, and on the pore regions of the membrane with reverse directions.) This is a “sandwich” structure is the bi-membrane model. In eukaryotic cells, the outer nuclear membrane shares a common border with the endoplasmic reticulum, and the inner nuclear membrane encloses the nucleoplasm that is covered by the nuclear lamina. The cell membrane still connected with diverse structures. All these are belonging to either the endomembrane system or the cytoskeleton system, dynamically equilibrium & shifting the surface tension inversion or gravitational binding for all the biological functioning. No matter how complex the system, we still can simplify them into the above “cell bi-membrane model”. This is not the anatomical structures we see; it is the surface tension inversion or gravitational binding distribution model; therefore, both prokaryotic cells without nuclear membrane, and the human body with trillions of cells, still can be modulated by it. (The cell membrane of Gram- bacteria is an example; different from gram+ bacteria only with a peptidoglycan cell wall, Gram- bacteria possess outer membrane that similar to the inner cell membrane in composition. Such an outer membrane-cell wall-cell membrane sandwich structure is the bi-membrane model. The similarity between the outer membrane and the inner membrane means the same evolutionary origin.)

All the biomaterial (such as DNA, RNA, proteins, etc.) folding are driving by surface tension inversion or gravitational binding. Due to folding is a physical process, any equivalent combinations of surface tension from different biomaterials could induce the same folding condition. Board folding states of the same protein sequence is the basis for the multifunction of that sequence. Proteins do need surface tension inversions transferring from either endomembrane or cytoskeleton system for functioning; therefore, structure biology not only needs to find folding conditions from inner structures but also need to incorporate those with relative mobility $R_{mobility}$ (or R_{hv}) from concerning biomaterials; right now even the inner structure folding mechanism and the number of folding states of a protein sequence are unclear.

(**Fig.h**) shows the largest surface tension inversion or gravity binding structures in the human body, the CSF (cerebrospinal fluid) anatomical cavity. CSF is a very clear liquid in the figure surrounding the cerebral cortex & spinal cord, and also to the ventricle [(**Suppl. Ani 2**) shows the CSF ventricle system deep inside the brain. CSF is separated from blood circulation by the blood-brain barrier (BBB) that is formed by endothelial cells of the capillary wall, astrocyte end-feet ensheathing the capillary, and pericytes embedded in the capillary basement membrane.] Similar to the surface tension directions of the “cell bi-membrane model” in (**Fig.g**), the net surface tension direction of CSF at the ventricle part is outward, at the brain part is inward; and at the spinal part, refers to the somatic body it is outward, and refers to the spinal cord, it is inward. From here, we also know, CSF enters into the ventricle will definitely via “inversion” processes. (CSF includes board binding & inversion with the somatic body. Only refers to the CSF non-ventricle part, inversion is the physical “pass”. Later in this paper, we’ll modulate

the inversion process by frequency energy and music harmonic model.) The difference of surface tension between the ventricle CSF outward forces and the cerebral cortex CSF inward forces on the upper sphere of the brain should be relatively small, could roughly estimate by the CSF vertical height difference since CSF ventricle cavity and the CSF peripheral cavity are connected. It is such a few centimeters CSF height difference decides the functions and thinking process of the whole brain. (All the biological functions include thinking, are driving by surface tension inversion or gravitational binding.) On the lower sphere of the brain, CSF continuously cycle to the bottom of spinal cord; we still can estimate the surface tension difference by the CSF vertical height difference between the ventricle and the bottom of the spinal cord (L5), this time the difference becomes large to the size of a spinal cord and the mechanisms similar with BBB are gradually attenuated; it is still such a difference controlling the whole somatic functions. The surface tension inversion or gravitational binding of the CSF brain part and the CSF somatic part should be equilibrium due to the principle of least action. Hypertension is a kind of senility problem which results from the unbalance of these two parts. At a young age, these two parts are balanced, with the increasing of age, the somatic part will be easier to lose binding than the brain part if lack proper physical training, such unbalanced loss of binding is hypertension. CSF is the highest surface tension inversion or gravitational binding that steers blood distributions in the whole body. The reason for hypertension or encephalorrhagia is deformed blood distribution in the body. From hypertension, we can understand, the driving forces of blood distribution are not heart and blood vessels. Such driving forces largely come from the holistic surface tension inversion or gravitational binding transfer in the body and will finally reflect on CSF. Sexual behavior is stronger evidence. (The conventional theory just believes blood flow into corpus cavernosum penis and facilitates the coitus and fails to explain why blood can't continuously flow as our will. Actually, it's not blood; it's the higher surface tension blood or higher gravitational binding flow steers by CSF from the whole body which after on-site still connects to every issuing parts, due to the amount of surface tension inversion or gravitational binding is limited; therefore, can't deliver to there as our will. The conventional theory also believes every activity is governing by the nervous system, hormone, etc. However, it is surface tension governs all the things include the nervous system and not in reverse, then the will must subordinate to surface tension. Most placental mammals possess bacula, and human doesn't; this fact means a human has a higher percentage of surface tension regions in corpus cavernosum penis while active, and the highest rate just before ejaculation, and those mammals with bacula have a lower percentage of surface tension regions compare with a human while activated; and the exchanging quantity of gravitational binding in sexual behavior is also lower than that of a human being. This is an evolutionary trend that selects the male that has a higher percentage of surface tension regions or gravitational binding by the sexual behavior; more surface tension region or gravitational binding means higher bio-inertia and the advantages in evolution. (For this conclusion, we can do a simple experiment for validation, just cut the male organ of an animal at the erection state, better near ejaculation state, then on an ordinary balance with a beaker can get the gravitational binding evaporating curve. For large mammals, the evaporating curve can last for hours. I still not done this experiment due to it is too cruel to life. If someone really needs some evidence for the conclusion, just follow this damned experiment.) Sexual behavior does play a decisive role in evolution by surface tension or gravitational binding controlling. Some people have claimed to build AI companions for human beings; actually, they can only make an AI girlfriend and can't make an AI boyfriend. A structure like a corpus cavernosum penis that can polarize all the body surface tension inversion or gravitational binding and deliver on-site is far more challenging than present available technological level. In sexual behavior, what exchange is a large amount of gravitational binding or surface tension; not only the process need gravitational binding, but also the final ejaculation is driving by gravitational binding; this has revealed in (Suppl.Exp.13). For the AI boyfriend story, all man-made devices nowadays can only exchange mechanical signal and can't exchange gravitational signal; therefore, can't compete with a real surface tension polarization organ. A science-fiction movie presented a "metal man" which bullets penetrate through the body only make holes and can

be recovered quickly; actually, metal doesn't possess such kind of characteristics, only metal surface tension region does; so if we want a metal man like that, we have to make it mainly composed of "metal surface regions" instead of metal non-surface tension regions, and each surface region also get different controls. Grab some metal robot parts in hand, the surface tension region of such parts is only thick in the nanometer scale, and the non-surface tension region will be thick in centimeter scale; then, the percentage of surface tension region is estimated around 10^{-7} . Nowadays, technology can only get so lower a surface tension region rate; therefore, all the robots we made are far less than the "metal man" for recovery capability. A structure with higher percentages of "surface tension regions" and also each surface tension region possesses Le Châtelier's control is life. The challenging for making an AI boyfriend does equal to the challenging of such a high surface tension rate metal man since they have a similar structural mechanism. Two people hug together can exchange a substantial amount of binding gravitational waves; however, hug with a robot can't exchange any gravitational binding even if we can make the same skin temperature and elasticity. Today's engineering can only make products with Newtonian physical parameters, can't deal with any surface tension region parameters. The above parameters, such as skin temperature, etc., are only Newtonian physical parameters that can't bind any Einstein's gravitational waves. (CSF body is a bio-structure that a little bit close to the metal man; tolerable damage can be recovered like the metal man. It possesses the highest recovery capacity of the human body, far beyond today's technology can reach.) AI boyfriend is still a science fiction story since we lack control of any surface tension region parameters.)



a) the "metal man" in a movie with powerful recovery capability, it needs > 60% of surface tension region rate (with nm scale parts) to achieve only with 10^{-7} level of surface tension rate in China, it can't bind any gravity

We can observe capillary action due to gravity possesses a characteristic tending to higher surface tension regions; it is this characteristic shifting of surface tension in the body. We can define the redistribution of surface tension inversion or gravitational binding that not significantly change resident structures as "polarization", albeit later structural shifting possibly follows such a polarization. E.g. the jumping of transposons or genes on a genome will induce a greatly gravitational binding shift; this is not polarization since genome structure changes. If the genomic sequence not change and only surface tension or gravitational binding potential of this sequence shift from this end to that end, we then call it polarization. The polarization of gravitational binding or surface tension inversion in bio-systems is the basis for all functions. (It is such a gravitational binding polarization that assures the principle of least action to be followed in bio-systems.) The human embryonic development in (Fig.1) clearly shows how surface tension inversion drives the process; cleavage, cell migration primitive streak, diverse developmental folding processes are all observable surface tension inversion processes. Only attributes the driving forces of developmental processes to a few genes, proteins, or signals face methodological challenging. Development biology has to shift to physical gravitational or surface tension inversion constant K binding research method.

Bio quantum path is born for surface tension modulation, albeit it is acquired from the macrocosmic object study at the start. (We need to note, at (Fig.1d), the sustaining signal for a bio quantum path is only the z dimensional gravity; once enter into a certain surface tension region, the sustaining signal becomes the gravity of all bio quantum paths in the whole region. Like a drop of water on an undissolved surface, the sustaining signal for a certain bio quantum path comes from the gravity of all the molecules at the contacted surface with certain uneven distributions.) The upper part of (Fig.j) shows the bio quantum model for modulating the surface tension of two kinds of liquid. The lower part of (Fig.j) is from (Fig.1d), we still can use surface tension model for the solid condition, just regard conservative force as one phase and friction counteracting regions as another phase. The bio

quantum path composes of two parts, the sustaining signals and the fluctuation path. In a liquid state, the phase contacted surface becomes the sustaining signal since it can supply stable vectors. All the contacted regions are therefore governing by bio quantum paths. Bio-systems mainly composed of surface tension regions; all these regions inside bio-systems follow bio-quantum paths. (This is a general model for enough Le Châtelier's binding system; both liquid surface tension and solid friction splicing out model or mixed possess enough binding.)

(Fig.k) shows the converging superposition of multi-surface tension. Suppose a cell composed of a series of surface tension bi-layers. (each bi-layer composes of one surface tension inward layer and an inversion layer, for a simple only two bi-layer, complex cell possibly possesses hundreds of surface tension bi-layers) We have mentioned gravitational polarization; that is the gravity shifting while structure not changes. So while this series of surface tension regions not change, the gravitational binding still has a range, min and max. We call the maximum gravitational binding state based on certain environmental conditions as the converging state, and the minimum state as the loose state. There must have a converging region or pattern between a converging and a loose state. For all multi-surface tension system, the loose state tends to concentric circle or sphere; at converging state, all surface tension regions tend to converge to a common region. We will give the details of converging regions later. (Fig.l) shows the spinal cord is developed from the converging region at the cell or even lower level. Each level of surface tension regions has the converging region, and all the converging regions at diverse levels finally superpose on the spinal cord. CSF is the common surface tension region or converging pattern of the whole body and possesses the highest gravitational binding. As mentioned before, the bio quantum path is a model quite fit for surface tension regions, so we can use this model to modulate CSF as in the figure. For a drop of water or other liquid, we can only use bio quantum path for the surface layer or the contacted surface as in (Fig.j); CSF is a special liquid full with higher percentages of surface tension regions, so we can use bio quantum path almost every place inside CSF as in (Fig.l). Generally, there are 5 lumbar vertebrae, 12 thoracic vertebrae and 7 cervical vertebrae in a human spinal column; totally 24 vertebrae which can be expressed into 24 layers of bio quantum paths, and each layer of bio quantum paths compose of 12 subordinate bio quantum paths; therefore, at least $12 \times 24 = 288$ layers of bio quantum paths, possibly even larger. In contrast, an *in vitro* liquid with the same shape with that of the CSF body, only one layer of surface tension region for bio quantum path to modulate. Use the bio quantum path for CSF surface tension modulation, z dimension is composed of z+ and z- with different ratios. E.g. For L4 vertebra, $|z+|/|z-|$ is 23:1 since above L4, there are 4 lumbar vertebrae, 12 thoracic vertebrae and 7 cervical vertebrae, L3 is 22:1. And this surface tension region needs more intermediate bio quantum paths with different z+/z- ratios to transfer to other vertebrae, we can write L4 as follow, then other vertebrae can use the same way, just with different $|S_z^+|/|S_z^-|$ ratios:

$$\begin{cases} x = A_x \cos(\omega t + \varphi_x) \\ y = A_y \cos(\omega t + \varphi_y) \\ \text{lumbar 4, } \{|S_z^+|/|S_z^-| = 23:1, \begin{cases} z^+ = S_z^+ \cos(\omega_z t + \varphi_z) \\ z^- = S_z^- \cos(\omega_z t + \varphi_z) \end{cases} \end{cases}$$

(Fig.m), food digestion is a surface tension inversion process. As we see in the figure, early food gulping in a cell is by the inversion of the cell membrane; this is a surface tension process. Later, the more complex gut system involved; however, the fundamental function of inversion is still not changed. What we need is surface tension from the foods. The excretions are lower surface tension leftovers. In ancient gulping air technology, the air gulped into the gut still equivalently possesses gut wall inversion function, just no conventionally defined nutrients inside.

(Fig.n), proteins inside a cell, while not dissolved, are either on the or inside intracellular endomembrane system, "on the" means same surface tension with the cell membrane and "inside" means inversion surface tension. Proteins from the cell membrane to the nuclear membrane, or transport to a certain site, installation on certain sites, or lysis, etc., generally experience a series of vesicle or endomembrane usages, each one is an inversion, we call this relay inversion. It incorporated with the Principle of Least action in bio-systems.

CSF can be regarded as the wave function of bio-systems; we'll give theoretical details later. Diverse

applications of gravitational binding are as follow (some include theoretical approaches):

- ① Conventional microbial deep aeration fermenter could be replaced by the HiGee system.

We should understand that a HiGee is totally different from a deep aeration fermenter, even if they looked like each other. Environmental surface tension should play a critical role in earlier cell evolution. If engage well, fermentation and product extraction can be integrated together. However, this is far more than just an application. From the new model, a gene is actually a surface tension carrier, knowing the R_{mobility} of each gene is even more prior than that of just a nucleotide sequence of each gene. The surface tension of microbes comes from the environment as well as the community. Community structure and the cell number will contribute to the acquired surface tension significantly. Therefore, the transformation DNA segments are those with higher surface tension segments. To know the gene surface tension from the bacterial transformation, or from the bacterial community, we need to build laboratory-scale HiGee. The sample size of such a miniature HiGee could range from a few hundred ml till Ep tube size after PCR is finished then directly transferred to the micro HiGee system. Such HiGee requires different types of RPBs constructed in a lab for different kinds of surface tension environments.

- ② Hemodialysis and derivatives need miniature HiGee system

Hemodialysis is the choice of renal replacement therapy for patients who need dialysis acutely, and for many patients as maintenance therapy. Right now, the dialyzer is based on the semipermeable membrane theory; however, this is an incomplete concept. Suppose we have ten ingredients that need to be removed, then the semipermeable mechanism has to design one pore size for the first gradient, then the second pore size for the second gradient, and so on; even no consider the jam of the pore, the efficiency of which will be quite lower. Later, peritoneal dialysis that utilizes the patient's peritoneum has been developed, still not solve most of the problems. Bio-systems actually work in another way, simultaneously remove these ten ingredients and select by surface tension inversion or gravitational binding with cycling adjusting. Therefore, we can use HiGee for Hemodialysis; put O_2 or O_2/N_2 mixture from the air inlet and blood from the liquid inlet, possibly need the new Chinese patent with runback tube (**Fig.c**). (All HiGee patents are registered for chemical engineering use, so any new design in bio-systems will make no infringement.) For this design, the structure of splitting RPB is the critical point. The cycling volume will be similar to real blood flow from the kidney; we call it biomedical scale HiGee. We even can design artificial lung and artificial kidney together. The industrial device usually takes an empirical formula for calculation, rarely uses gravity and relative mobility. However, the biomedical scale HiGee is not restricted to applications. Conventional biology just gives diverse cells, antibodies, proteins inside blood for certain functions and based on these functions for study. The most important characteristic of all, the relative mobility of certain cells or antibody under certain blood environment is un-utilized. Directly use such scale HiGee to adjust gravitational and surface tension parameters, then we could measure diverse relative mobility. (We only know surface tension \propto gravitational binding; however, they are not in a linear relationship, thus both need to present as parameters.) Relative mobility under certain conditions can largely decide functions and inversions. Diverse physical problems such as atherosclerosis, gallstones, kidney stones, etc., can be modulated with such a system simplified with only two theoretical "phases". Without such a gravitational device, the above physical problems are challenging to deal with by the conventional systems. Flow cytometry is for research; it takes liquid as a mobile phase and nozzle relative mobility for separating and sorting cells. However, it never realizes the relative mobility based on the gravitational environment. In the future, it possibly needs to be modified into a gravitational controlled device instead of a nozzle controlled. Gravitational control is more close to natural conditions; just some technological restriction, a HiGee with size can flow a few microliter cells do require more works. Not only flow cytometry but also diverse electrophoresis should considering gravitational parameters. If a very small HiGee that can deal with the small samples can be worked out, it even possibly replaces electrophoresis. Not only for cells but also DNA, proteins' separation, folding need such a device. Theoretically, even a cell is a small RPB; just a device with such a scale is quite challenging for nowadays'

technology. However, to make a HiGee with Ep tube size is possible.

③ Human blood or other liquid system surface tension miniature HiGee sensor

To get the relative mobility of diverse blood cells will be not that difficult, quite earlier than those for tissues or organs; just take endothelial cells or certain protein, or even directly use artificial materials to construct RPB, then with tubes directly connect to blood vessels; such a small scale HiGee itself is a sensor for dynamic parameters on that environment. Change the structures and composition of RPB possibly can finally get the R_{mobility} for all blood cells. The R_{mobility} of tissues or organs need based on the data from blood cells also needs to combine with the somatic physical training system. All the critical points are still the structure of the RPB.

④ Human thinking study

Human or animal thinking is still by means of surface tension inversion; all the research about thinking and memory can't avoid surface tension regions.

⑤ Food digestion study

Now it is clear that all the gravitational binding or surface tension we need is from the food. And those decide the absorption is still surface tension; both nutrients and gut microbe should be studied by their surface tension contribution in the intestinal fluid. The body can only absorb nutrients with enough surface tension based on the body constant k , the shape of feces is from surface tension being absorbed, diarrhea means no surface tension is taken out from the digested mixture. The simulation of all these processes is still by means of small scale HiGee. The sample amount roughly the amount of small intestinal fluid. We eat food for surface tension; ancient gulping air technology is for increasing the percentage of the surface tension acquired from the food. This technology still can be simulated if a small scale HiGee is available.

⑥ physical strike study

The ancient physical strike system is a complete physical interference system that will benefit modern society to follow with the evolutionary trend. It is actually a surface tension intensify system. After the proper strikes, all the surface tension compositions of the place will be intensified and also transferred to the spinal cord. Study this system not only have board application significance but also can decipher all the polarization of gravity processes in the human body, facilitate the understanding of evolution and gravity in detail.

⑦ two categories of general and one types of urgent environmental surface tension pollution that threaten life

Besides evolution, surface tension also plays a critical role in environmental protection. The first category of surface tension problems is organic pollution. Due to life depend on surface tension or gravitational binding for functioning, all the feces or wastes are lower surface tension region organic leftovers. Such kinds of organic wastes will induce diverse problems such as eutrophication, etc., if not properly handled. Aeration the higher BOD waste water will be a higher cost. If enough land available, filter by land, natural sediment or artificial centrifuge will reduce cost. These ways will further accumulate organic sludge, and some places such as high-density farming, slaughtering, food processing, etc., will also directly produce a large amount of organic wet wastes. The best way to deal with all these types of organic wet wastes is by raising cockroaches. Cockroaches can remove the large percentage of organic matters efficiently, no matter which sources and moisture. In China, this technology has been validated for many years; some of the large cockroach manufactories can hold one billion cockroaches, less than ten workers, and all the equipment are automatic. The temperature for drying is enough to kill all the eggs hidden inside, and then no proliferate-able cockroaches or eggs come out of the manufactory site. Dried cockroaches can be used for poultry or fishing feeding, and many processing raw materials. If no processing plant in the local area, just directly put the dried cockroaches back to the soil. Dried cockroaches are different from the sludge types since surface tension regions have been appropriately increased and will not produce effluents or eutrophication problems, this way even can increase the local ecosystem capacity and build new derivative food chains in the wild.

The second category of surface tension problem is plastic bag pollution. Plastic films have large surface

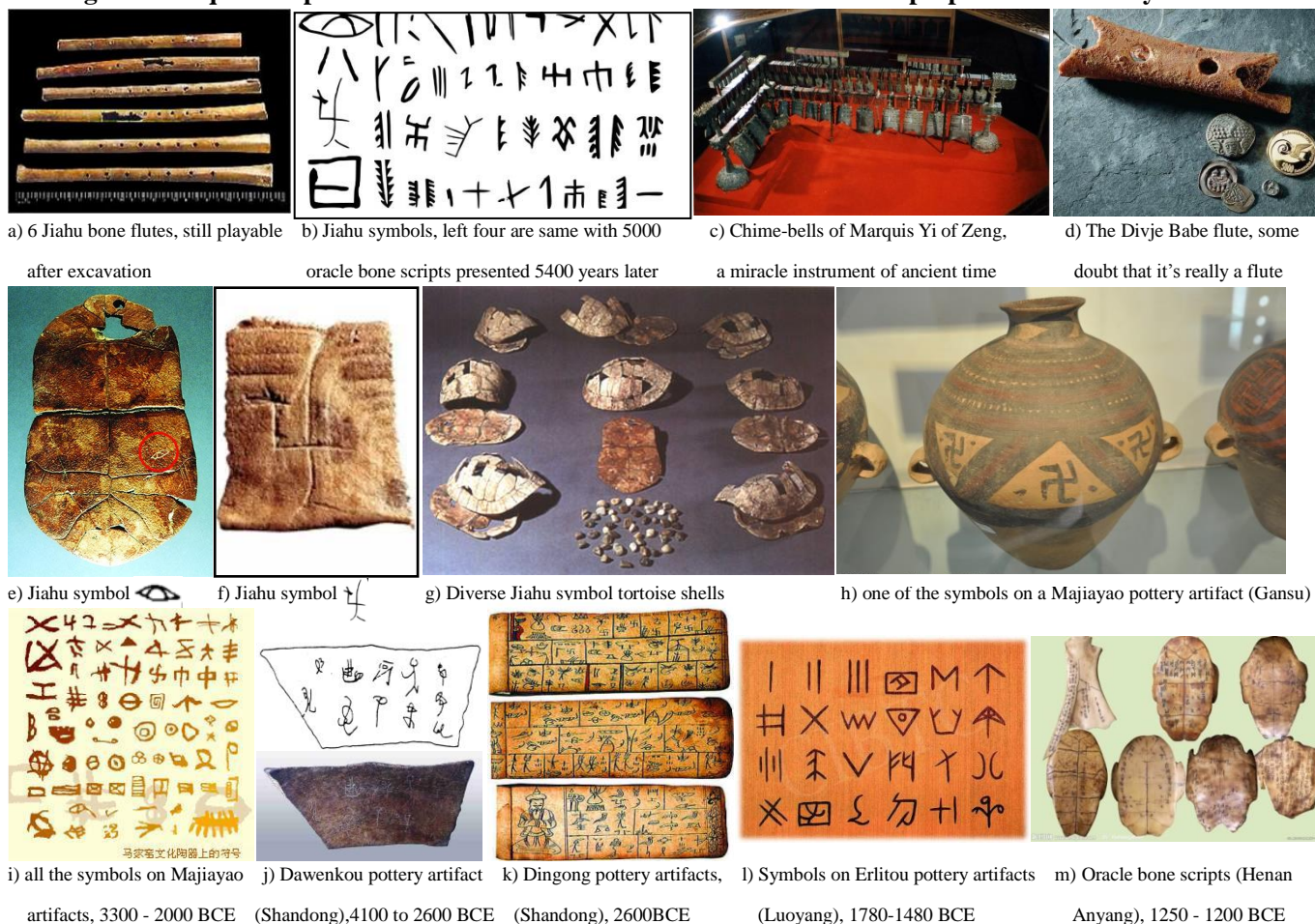
tension but very stable in the environment. Evolution is driving by surface tension inversion or gravitational binding; therefore, large surface tension objects, no matter which types, will attract most animal species to gulp them. Even the human babies, while they begin to eat, will 100% gulp plastic film more than any other object due to its large surface tension. Attract to the large surface for trying food is an evolutionary characteristic due to life is based on surface tension for functioning. Different from other natural materials that with large surface tension means life will relatively be easy to get gravitational binding from them or digest them under certain conditions, the surface tension of plastic films is inaccessible for bio-systems. In the natural environment, they can easily stable for a century, thus dangerous to wild animals after gulping. The best way to deal with the second category of surface tension pollution is re-melting them into a thick solid state and also embedding some weight such as stone or waste metal; then the total density is higher than water. Completely re-melting is ideal; they can stable in the environment



for more than a century. No matter put in the sea or buried on land, will not threat to wildlife. Sometimes, complete re-melting is not easy due to the complexity of plastic films. Half re-melting, as in the photo still ok; however,

these “blocks” can’t stable for decades; therefore, it is better to give them a thick recycling plastic shell over 1cm. These are the fundamental ways for dealing with two categories of “surface tension pollution”. Some of the industrial heavy metal, batteries, some of the chemical pollutants, etc., still can take the same way; just wrap in a thick recycling plastic shell over 1cm and total density higher than water, then dispose of in the sea. Right now, there are a lot of publications about heavy metal and chemical pollutions; those are just published stories which not really feasible. In a real-world, most of such pollutants are actually directly dump in most countries. Physical wrapping is a feasible way. For plastic film “block” outer shell, it is not necessarily water tight; however, for heavy metal or chemical pollutants, the outside over 1cm shell must completely watertight. The above methods for surface tension pollution, will not be challenged by technologies, also cost is not unaffordable; just challenged by administration and disposal charge. In developing countries, a lot of people can do such a job. The applications of the above two pre-disposing methods world-wide are much more urgent than those of other proposals, such as carbon dioxide emissions, etc. Surface tension pollution directly threatens life from every corner of Earth, while the threats from global warming are remote, restricted to the Earth’s polar regions, and still not get validation. (The global atmosphere possesses its own constant K, carbon dioxide emissions as a single factor can not quickly impact on global temperature. It binds a lot of unknown factors. If we really want to control the climate, all factors or at least the leading factor must be controlled. Carbon dioxide emissions are less likely to be the leading factors.) There is still one kind of most urgent surface tension pollution, which is the radioactive waste. It indiscriminately damages all surface tension of life with a long half-life. No better way to deal with, have to cost vast disposal land for over 80 millennia. Some counties made them into depleted uranium ammunition; this should be absolutely prohibited. Dumping of diverse waste only impacts on the environment for decades, your neighbors will shout to you; dumping of radioactive waste by depleted uranium ammunition will impact on the environment for at least 80 millennia. The officially allowing of “dirty bomb army” on Earth and the US even actually used them in large quantities in the Gulf War is the stigma of the human race. It was a devastating of life and trampling of human dignity on Earth. Japan Fukushima Daiichi nuclear disaster has dumped a large quantity of radioactive seawater, which was also a devastating of life; however, it still could reluctantly give the pretext of disaster, they are just “dirty nation” that dumping “disaster” to the world and not produce “dirty bomb”. I don’t know how to justify the dirty army, why President Bush didn’t like to use a “clean bomb army” to capture Saddam Hussein? Is there any calculation of the dirty bomb in Iraq equal to how much emission? Reducing till finally elimination the entire nuclear plants world widely and also forbidding the dumping of radioactive waste are more urgent issues than the so-called global warming problem.

Supplementary Explanation 5 | Artifacts concerning with music and writing language in the history of China, the origin of 12 equal temperaments and Chu's constant for surface tension superposition efficiency Δ



The evolutionary emergence of speech in the human species is difficult to track due to lack of direct evidence; theories include 2.5million¹, 1.8million, 0.6 million till 0.1million years ago. (However, we should realize all these suggestions only significant for certain specifically defined types of human acoustic languages. For an “absolute language concept” in bio-systems, even plasmid could be regarded as one kind of “language”. Before plasmid genes are transferred to another bacterium, they have experienced Le Châtelier’s processes with all the genes from the donor, and after transferring, the plasmid genes will also experience Le Châtelier’s processes with all the genes in the receiver and recover their oscillation patterns. That is a very general standard “language” model. As a general Le Châtelier’s information carrier, we really can’t say such a “language” only present in human beings.) For the emergence of music and writing language in humans, things are improved from artifacts. The Divje Babe flute, carved from a cave bear femur, is thought to be earliest and at least 40,000 years old (some people doubt it is a flute, possibly just an ornament since no relevant artifacts find again). The richest collections of prehistoric musical instruments were found in China². Thirty-three Jiahu bone flutes (only 6 remained complete) carved from the wing bones of cranes are among the oldest playable musical instruments in the world, dates from 7000 BCE to 5700 BCE³, excavated in 1999 from a neolithic Peiligang culture site found in Henan Province of China. These flutes have already included 5-note, 7-note, 8-note, and 10-note scales. One of the Jiahu bone flutes possesses astonishing 12-TET scale accuracy, from C6-A6 by modern standard 12-TET as 1000 cents, that bone flute attains 1023 cents. Even today, most of the musical instruments on the markets still don’t attain such accuracy. (Suppl. Movie 5) demonstrated the sound of a generic bone flute that strictly follows the artifacts. We don’t know so accurate a 12-TET scale is just an “accident”, or ancient people have already known some technologies about 12-TET. Since

the historical time of Jiahu bone flute is seven thousand years ahead of the Chu's 12-TET calculation. (Today, if we want kids to reconstruct a Jiahu bone flute for education purposes, utilize turkey bones that well available in the market is a good idea. A toolkit well enough for a flute only costs \$10 in China. I have done so for my baby.)

Jiahu symbols comprise 16 different signs carved on tortoise shells are presented in the same neolithic site⁴ in 1986, dated back to 6600 BCE. Four of these symbols have come to 5000 oracle bone scripts which are acknowledged as the earliest Chinese writing language dated from 1250 BCE - 1200 BCE⁵. (Only 1500-2000 of those 5000 oracle bone scripts can be discerned and have evidently evolved to modern Chinese language, include the 4 scripts which had presented in Jiahu symbols 5400 years before have also evidently evolved into modern Chinese language. From Jiahu symbols till oracle bone scripts, there were also diverse intermediate stage artifacts have found, as shown in the figure. Here not inclusively demonstrate all the artifacts found in China but enough to show that the development of writing language is via "splicing". Only around 1/4 of Jiahu symbols have evolved into modern Chinese language, and also only 3/10 to 2/5 of oracle bone scripts have evolved, the "writing symbols loss rate" is quite higher.) Musical instruments should also be developed through "splicing", here we not show all intermediate stage and just to the most advanced one. It is excavated along with more than one hundred wooden and bamboo musical instruments in 1978 in Suizhou of Hubei Province, named Chime-bells of Marquis Yi of Zeng⁶, is the largest and also a miracle ancient musical instrument in the world. It was made in 433 BCE, 7.48×2.65m (L×H), included 65 bronze chime-bells totally weight 2567 kg, with rack totally 4421.48kg. The tonal range of which is from C2 to D7 covers five full 7-note octaves in the key of C Major, including 12 note semi-tones in the middle of the range. On the chime-bells of Marquis Yi of Zeng, there were around 2800 Chinese character inscriptions recorded the different ancient musical harmonic systems of that location and nearby states, demonstrated that ancient people were not only quite higher skilled in bronze casting but also knew (Fig.1g①) and 12-TET profoundly, at least have some special methods to tune the instrumental 12-TET. Among the five-octave range, one central C major scale can fully attain the accuracy that of a modern piano; just some extended octaves are slightly out of tune. We should realize it has been buried underground for more than 2400 years and still can get one octave in such accuracy. If that is a piano soaked in water inside the same tomb, we will definitely not hear any sound again; all the nearby wooden and bamboo musical instruments have been rotten into a soft state like noodles. These facts meant that ancient people in the time of chime-bells of Marquis Yi of Zeng did know 12-TET.

Historically, the 12-TET theory was acknowledged and calculated approximately by Chengtian He, a mathematician of Southern and Northern Dynasties around 400 CE. And the accurate calculation was credited with Tsai-yü Chu in 1581 CE. Following historical comparison table is from J. Murray Barbour⁷, (slightly modified):

Year	Name	Ratio	Cents	Additional Note
400	Chengtian He	1.060070671	101.0	earliest theory of 12-TET
1580	Vincenzo Galilei	1.058823529	99.0	father of physicist Galileo Galilei
1581	Tsai-yü Chu	1.059463094	100.0	first accurate calculation of 12-TET
1585	Simon Stevin	1.059546514	100.1	did free-fall in 1586, earlier than the legendary Galileo experiment
1630	Marin Mersenne	1.059322034	99.8	Mersenne's laws in music
1630	Johann Faulhaber	1.059490385	100.0	Faulhaber polynomials

12-TET theory can be directly deduced from (Fig.1g①), albeit Chengtian He was credited with the first who invented the theory, it had already presented on Chime-bells of Marquis Yi of Zeng or even earlier. Tsai-yü Chu got the first accurate value of $\sqrt[12]{2}$ in the world. (He took an ancient tool abacus to calculate the value to 25 digits after the decimal, also the first in the world to construct standard 36 bamboo tuning pipes ranging in 3 octaves, also constructed a 12-string tuning instrument. We should realize that there are significant differences between those who get both the theoretical value and a real device and those who only make the theoretical calculation.) For all

the modern musical instruments, oscillation frequencies can be calculated by the equation: $f_n = f_1 \times \sqrt[n]{2^{n-1}}$, which we'll use in this paper later, so we call the ratio $\sqrt[n]{2}$ as "Chu's constant". (For the historical contributions of "Chu's constant" to the musical world, Matteo Ricci, a Jesuit in China, recorded this work in his personal journal⁸ and brought it back to the West⁹. Chu's works were also referred by Hermann von Helmholtz¹⁰, a German physicist who wrote down Helmholtz equation, and Victor-Charles Mahillon¹¹, the first curator of the Musée Instrumental du Conservatoire Royal de Musique (the Musical Instrument Museum), confirmed the influence of his works to Europe. After 12-TET disseminated into Europe, maturation of the staff notation system, the printing technology from China, and later prevalent of the piano made great contributions to the development of musical world; a lot of great musical works presented. For any historical time, the development of music largely relied on the public's access and demand for it; therefore, Beethoven could finally present. However, in China, music continuously remained for privileged people. Chime-bells of Marquis Yi of Zeng was a royal household product. Tsai-yü Chu himself was also an abdicated Prince. The Gongche notation which composed of Chinese characters is not easily learned in a short time. All these factors restricted the presence of great pieces of music. However, this conclusion only refers to pure acoustic musical works. If we look into other mixture-parameter harmonic works, the conclusion will possibly need to be reconstructed. Lack public's support and due to the demand of Royal, ancient Chinese people were shifted to a different way with that of European music, they mixed a lot of parameters into one composition for rituals as follow:

E	G	C	D	A
east	south	center	west	north
green	red	yellow	white	black
Jupiter	Mars	Saturn	Venus	Mercury
wood	fire	earth	metal	water
liver	heart	spleen	lung	kidney
			.	.

The first line is a musical 5-note scale, corresponding to other categories of scales in the table, then a composition becomes a mixture of musical notes combined with the harmonic of other scales. This table is very long to cover almost everything ancient people met with; we only choose a small fraction to show that European music only to use the first line for composition, and ancient Chinese people use the whole table combined together for production. Such kinds of mixed compositions are highly demanded by royal and rich people but not public. Therefore ancient Chinese people have created a lot of harmonic works in this type, quite different from the pure acoustic musical note compositions in Europe. (The above table is from "I Ching" which legendarily believed to be written down by King Xuan of Zhou in 1000–750 BCE. Actually, I Ching should be a generalized work which started from the Jiahu symbol stage till oracle bone inscription stage, totally more than five thousand years and finally written down by King Xuan of Zhou, without the works of many people in five thousand years no one could finally write down it. It had greatly splicing with the development of Chinese written language at that period. All over the world, only the Chinese language possesses such profound religious components. The harmonic analysis method we'll use later in this paper has possibly been used by ancient people for creating their writing language for thousands of years. Back to acoustic music, earlier Chinese music in Chime-bells' time took 7-note but later gradually became 5-note was possible for the demands of privileged people. I Ching is actually a Chinese version of general harmonic systems which composed of characters, hexagrams and integers, which covers major contents of the European acoustic musical harmonics but includes more scales. If we restrict to only use the first line of the table as scale, we still can get a musical harmonic work similar to those of European pieces of music. However, once remove the restriction, a lot of non-acoustic harmonic engineering works will be presented. Typical examples such as the Mausoleum of the First Qin Emperor, constructed from 246 to 208 BC and now is still underground for

protection, the excavated Terracotta Warriors region is only its peripheral structures. Great Wall of China, being built from as early as the 7th century BCE by many dynasties, with major parts were constructed in Ming dynasty (1368–1644). And The Forbidden City, constructed from 1406 to 1420, consists of 980 buildings, which cover 72 hectares, etc. All these huge engineering designs were actually achieved by I Ching. In modern times, if we want to construct a similar engineering project, we need computers, linear or non-linear programming models, hundreds of professional engineers and reference styles, etc. In ancient times, there were no such things; only available tools were abacus and I Ching, even no slide rule. And there were not many engineers available, generally only one designer and organizer for a huge project. Without I Ching and just one guy in a time notoriously short of modern tools, it is really impossible to handle above big projects. From all ancient engineering constructions and various artifacts, we always can see the fingerprints of the application of I Ching. In modern China, people no longer use it again since better tools are available. However, Chinese people still good at big engineering projects, such as “Three Gorges Dam”, “South-to-North Water Diversion Project” and “Hong Kong-Zhuhai-Macau Bridge”, etc., these huge modern engineering projects possibly still get some subtle influences from ancient engineering culture. We refer to such history just as part of the ideas in this paper comes from there. Also, history reminds us that gene evolution is still via “splicing” or Châtelier’s processes like that of language development, far beyond linear nucleotide sequences can include. Only a few thousands of years, human writing language has spliced out a lot of symbols in each stage; therefore the genes of bio-systems with billions of years of evolution should have experienced splicing processes far more drastic than those of the writing language, the “gene loss rate” should close to “writing language symbol loss rate”, some ancient genes such as Hox are still in use today just because of their higher bindings. If we believe that ribosomal or mitochondrial DNA compose of the most conservative types of genes even than those of the ancient genes in life, then they should have a higher binding than those of the ancient genes; we’ll then have to find how they bind gene networks or other parameters.)

In summary, from the above reliable history, the earliest musical instrument was presented around 4400 years ahead of the writing language in China since Jiahu symbols are only acknowledged as proto-writing signs and not formal writing language. Besides Chinese ancient writing systems, Sumerian cuneiform from 3500 BCE and Egyptian hieroglyphs from 3400 BCE are the earliest systems of writing in the world¹². (Some believe that Sumerian would be earlier and some believe there was no significant difference of emergent time.) Both of them were no longer in use later, and Chinese remains the only existing hieroglyphic writing system today. (It is regrettable that the artifacts of the writing language of these two cultures not show distinctive splicing stages in thousands of years like that of Chinese writing language we show in the figure, possible archaeologists still have a lot of jobs to do. We should understand that any language must develop via a long term “splicing” and a higher “loss rate”, impossible to present overnight.) The prevalent alphabetic writing systems nowadays are derived from the Phoenician alphabet, which presented in around 1050 BCE¹². Therefore, for all the ancient civilizations, musical artifacts were presented earlier than those of the writing language systems. Some people even believe that simple music such as drum dance should be present at the same time with that of oral languages, just no reliable evidence. The fundamental physical difference between language and music should be that music deal with conservative signals and languages deal with non-conservative signals rests on conservative signals, albeit within each category, there still can be further differed into conservative & non-conservative signal structures. (Bio quantum paths deal with forces and signals equally, with Einstein’s frequency energy as the driving forces.) For human babies, their reactions to music will be more prior than that of oral language. Therefore offer simple music or only scales to babies in earlier times will benefit their mental development and later oral language learning.

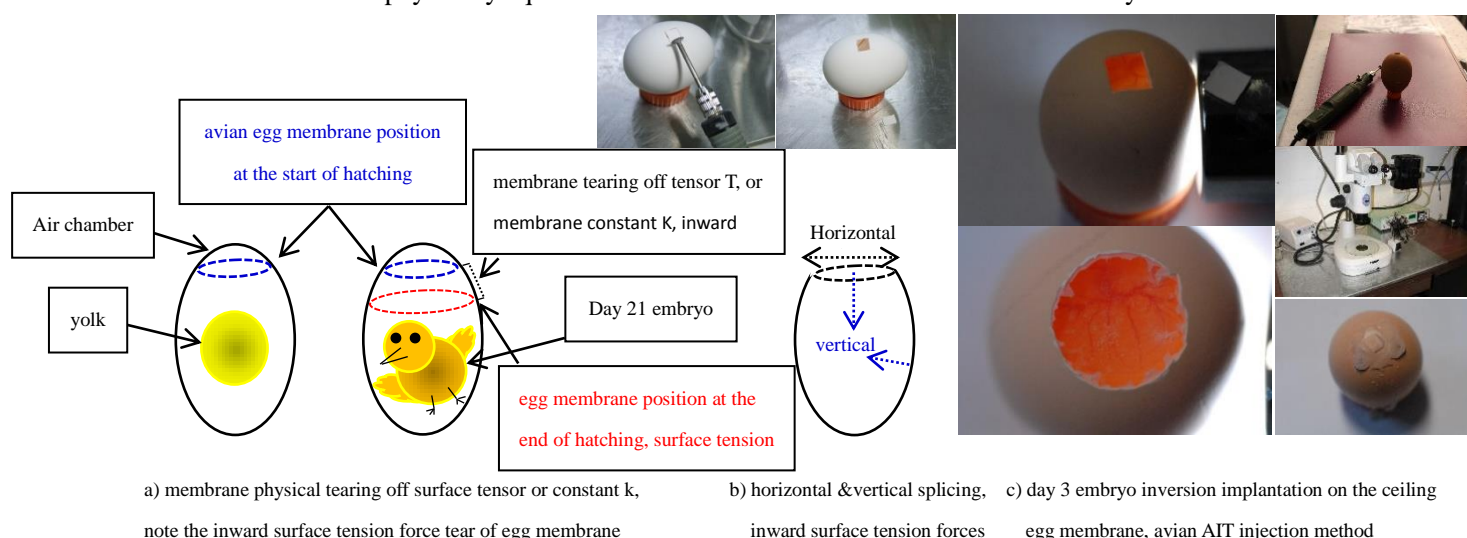
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Supplementary Experiment 14 | Modulate of cell membrane protein inversion by avian egg AIT injection with GFP mouse(Jackson 003291 - C57BL/6-Tg (CAG-EGFP)10sb/J) bone marrow cells and human umbilical cord CD+34 cells, primary implantation frequency and somatic physical growth and immunity model Δ

As in the paper, a lot of bioprocesses such as CRIPSP/CAS 9 functioning, gene expression, etc., always include horizontal & vertical splicing, which can be represented by diverse quantum numbers. Now we need to find the inversions of all these horizontal & vertical splicing processes with that of the membrane or cytoskeleton since membrane proteins such as GPCR should follow these patterns. To observe *in vivo cell* membrane oscillation is not easy; here we use an avian egg membrane as a replacement. Since the egg is the largest cell, the macrocosmic egg membrane should be physically equivalent to diverse microcosmic cell membranes or cytoskeletons.



As in **Fig. a)**, all the avian embryonic development will induce a “hatching tearing off” amount (in our laboratory on the only hatching machine, this mount ranges from 4-7mm for different kinds of eggs, the data for the hen range from 4-11mm). This “membrane tearing off tensor” T or membrane constant k, clearly show the inward surface tension forces, write into the equation for 21 day hatching period, $\delta T = \delta K$, T is the membrane hatching

tearing off amount and K is the Le Châtelier's constant K . It controls all the *in vivo* bioprocesses and growth; the manner is still by means of horizontal & vertical splicing, as in **Fig. b**). The horizontal direction is the tangent plane of the egg membrane and vertical perpendicular to this plane and increases with the quantum number. Start from the membrane, if any cells or biomaterial need enter into the chicken body, it need converge; that means the regenerative quantum number reduced; supposes any membrane protein oscillation with $n=6$ on the membrane, then it need converge the number to $n=5$, $n=4$, etc., to approach to the center, or transfer the oscillation to other proteins which follow the number. While meeting some resistance at a certain point such as at $n=3$, then it will tend to spread the whole structure of $n=6$, $n=5$, $n=4$, $n=3$ on the membrane for horizontal movement. This is the horizontal & vertical movement tendency of membrane protein.

As in the photo of **Fig.c**), while an egg is hatching to around 2.5-3.5 days, the embryo will attach to the ceiling egg membrane for about one day, later falls back into the inner egg. This is the "implantation" process that includes inversion. This inversion includes body posture inversion and circulation system inversion. No matter the egg posture, more than 90% of the embryo will implant on the air chamber region. This means the implantation is driving by surface tension. After spreading the chorioallantoic blood vessels on the egg membrane (as in the photo), the embryo fall back into the egg one day later, the chorioallantoic blood vessel system and the body system continuously growth and composed of inversion relationship. As mentioned before, surface tension in the egg needs to converge, suppose $n=6$ on the membrane, then it need converge the number to $n=5$, $n=4$, etc., to approach to the center; so the blood vessels on the membrane have one type of surface tension or relative mobility, the blood vessels inside the embryo must grow in the reverse way, first growth $n=1$, then $n=2$, till $n=6$, etc., that is an inversion relationship. Two sets of circulations are for this purpose. Lower evolved ovipara lack the chorioallantoic blood vessel systems and have to inversion inside embryo; in advanced species, it evolved into the placenta. The placenta circulation still composes the surface tension inversion with the baby. The concept of the "fetal blood barrier" is incomplete; this structure is for separation of blood and surface tension inversion blood, not for the story of shutting something. Menstruation is also due to the inversion of blood for pregnant. Membrane proteins such as GPCR should be modulated in the same inversion way since an egg is a cell, surface tension pattern is the same.

To verify the growth and immunity model, I designed the **AIT** injection method (abbr. of **air chamber implantation trans-membrane microinjection**). Just arrange the cell injection at the inversion stage and avoid damaging the egg membrane. As in the photo, A day 3 hatching egg open with a microsaw cut a 0.5×0.5 cm square eggshell, direct use microinjection be targeted to embryo body, even to the heart will be no problem if operate tenderly. The trans-membrane injection must not break the egg membrane and also can not detach the embryo down from the ceiling egg membrane; after injection covers the hole with sticks and then use wax to seal the region as in the photo, put back to hatching machine. Compare with diverse damaging egg membrane reports in table, with 30 eggs each group for opening egg membrane and put back to hatch without any injection (for all opening egg membrane operation, use a sterilized tweezers follow diverse opening egg membrane injection methods on literature; tenderly open a triangular membrane 2-5mm to expose the blastoderm and then rolling back the membrane, seal, put back to hatching machine with 30 °C and 65% RH. For membrane layer under eggshell directly cut chip, then open the membrane, as shown by the two white eggs in the figure. Brown eggs show the AIT method with embryos.):

Physical oscill impact of opening avian egg membrane to the hatching rate in a hatching machine

	CK	AIT method	Open blunt end	Open sharp end	Open equator	Open upper 45°	Open lower 45 °
Leghorn *	93.3%	96.7 %	3.3%	6.7%	10.0%	13.3%	6.7%
Beijing You Chicken *	93.3%	90.0%	3.3%	10.0%	6.7%	10.0%	3.3%
Leghorn**	90.0%	93.9%	6.7%	6.7%	3.3%	6.7%	3.3%
Beijing You Chicken**	90.0%	93.3%	10.0%	6/7%	6.7%	3.3%	6.7%

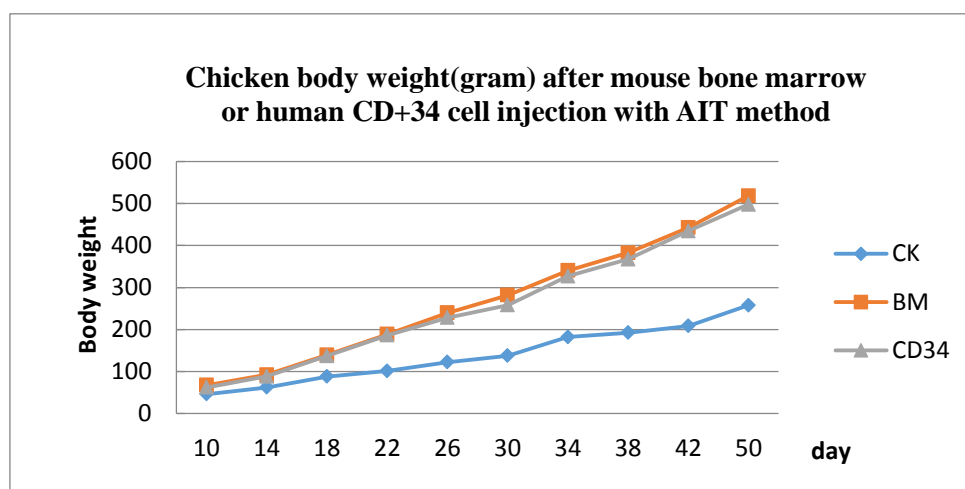
* All the treatments, opening the egg membrane or AIT method opening the egg chip at day 1

** All the same with * just opening at the day 3.

From the results, opening the egg membranes will severely damage the hatching rate. It means the egg membrane must work as a whole structure to function for embryo development; just a 2-5mm opening then rolling back will be lethal to the system since this small opening damages the “membrane tearing off tension” or the horizontal & vertical oscillation patterns on-site. This is a macrocosmic cell membrane tension we can see; in the microcosmic world, cell membrane tension is the same. The discrepancy between cell shape and in vivo environment is equivalent to the “tearing off tension” we see in an egg. For this reason, cell membrane or similar structures are truly tough to “repair”. The horizontal & vertical oscillation patterns of the cell membrane do bind all the horizontal & vertical oscillations of biomaterials inside the cell. AIT method keeps the same hatch rate with CK since it actually keeps the egg membrane intact. For the next cell experiment, stem cell injection verification of the immunity model, only the AIT method is effective. It can get around 55% hatching rate for diverse stem cells; other damaging eggshell injection methods generally need to operate 300-500 eggs then get a few hatching out.

We use Beijing You Chicken for the test. It is a local meat producing chicken breeds which can get 50% body weight increasing compare with CK. (Leghorn chicken is an egg-producing breed that can only get 10-20% weight increasing, meat-producing chicken can get more, as in our experiment.) The mouse bone marrow is from a newborn Jackson 003291 - C57BL/6-Tg (CAG-EGFP) 10sb/J mouse, wash out from thigh bone by PBS and re-suspension by stem cell graded Gibco A12861-01 KnockOut D-MEM CTS to 10^8 cells/ml, human umbilical cord CD34 stem cell is come from 50ml newly donated umbilical cord blood extracted by Stemcell Technologies 18056 EasySep™ Human CD34 Positive Selection Kit following the instruction of manufactory. (The umbilical cord blood was from Haidian Maternal & Children Health Hospital with donor signed consent. In this experiment, anesthesia will impact the implantation of stem cells, so the umbilical cord blood must from the donor without any anesthesia. In China, only C-section use anesthesia; near 70% baby deliveries never use any anesthesia. In western countries, all the baby deliveries take anesthesia; therefore, quite difficult to do this experiment. Storage also impacts on the result; only freshly donated umbilical cord blood can be used.) Pre-treatment uses hydroxyethyl starch 550 first deposits the mononuclear cells then use 18056 kit. This way will be convenient and higher efficiency than Ficoll for pre-treatment of a blood sample. Finally, use the Gibco A12861-01 medium re-suspension to 10^8 cells/ml. CK needs to injection with above medium but without cells. AIT method requires 2-6 μ l cell suspension for injection by a microinject (Zebrafish). 10 chickens each group as CK, GFP mouse bone marrow, and human_CD34. The bodyweight curve and flow cytometry map are the following:

day	CK	BM	CD34
10	46.1	67.5	62.3
14	62.2	92.4	88.5
18	88.3	139.7	137.4
22	101.6	188.6	186.4
26	122.3	239.7	228.3
30	137.7	281.6	258.2
34	182.1	340.4	327.2
38	192.4	382.6	367.4
42	208.6	442.3	434.3
50	257.5	518.2	497.8
R ²	0.9817	0.9927	0.9909



*** For the BM and CD34 mammalian stem cell injected group chickens, they grow at double speed than those of the CK group. And the final weigh after one year also around 30-50% higher than the CK. However, their anti-stress capabilities were lower than those of the regular un-injected chickens. In the severe

BD FACSDiva 8.0

Specimen_001-CK1 Unkns

Specimen_001-CK1 Unkns

Specimen_001-6P+ Unkns

Specimen_001-6P+ Unkns

CK

Specimen_001-CK1 Unkns

Specimen_001-CK1 Unkns

Specimen_001-6P+ Unkns

Specimen_001-6P+ Unkns

Specimen_001-CK1 Unkns

Count

RTCA

Tube: CK1 Unkns

Population	#Events	%Parent	%Total
All Events	276,594	###	100.0
P1	188,279	67.6	67.6
P2	184,217	97.8	66.1
P3	181,397	98.4	65.1
P5	39	0.0	0.0
P4	94	0.1	0.0

Tube: 6P+ Unkns

Population	#Events	%Parent	%Total
All Events	170,706	###	100.0
P1	129,221	70.4	70.4
P2	118,630	68.7	69.5
P3	114,206	96.4	67.0
P5	94,492	82.7	55.4
P4	95,944	83.9	56.2

Fluorescent cell agglomerations in the blood

44

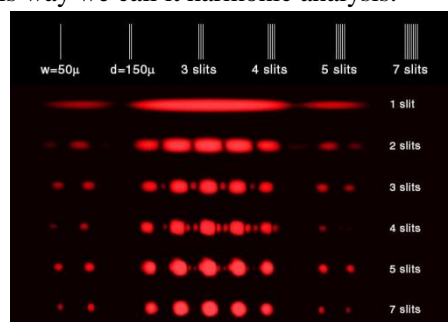
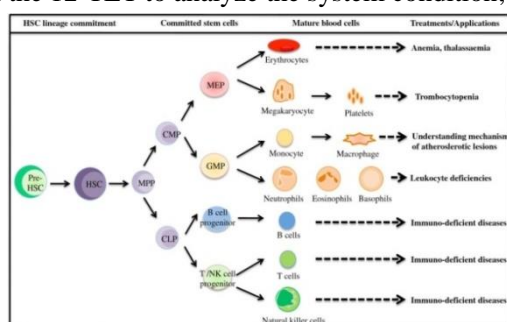
this is a general experiment, for all the animals or even plants; implantation stage is to get the first “memory” of horizontal & vertical oscillation on-site; therefore, it is the immunity ground oscillation state; diverse acquired immunities are establishing from here. Antigen presentation describes a vital immune process that is essential for T cell immune response triggering, and such kind of presentation is also a surface tension inversion process, similar to other membrane proteins. (We used CD+34 stem cells. The cluster of differentiation or classification determinant is often abbreviated as CD, is a set of cell surface molecules providing targets for immunophenotyping of cells. CD for humans is numbered up to 371. Now we can easily understand that all CDs are established by means of inversion, inner cell surface tension region info inversed to the cell surface.) Immunity is physically regulated instead of chemical regulated; even if only consider the chemically or biologically-based conventional models, we could find in conventional disciplines all of them are acquired immunity models available. Rarely refer to the innate immunity that comes from the spinal cord; if we want to measure the innate immunity, we still have to go back to the gravitational binding of the spinal cord.

From the growth curves, growth and immunity are inseparable Le Châtelier’s processes; and all of them rely on the “memory” of the primary horizontal & vertical oscillation on-site pattern of the cell membrane.

Supplementary Explanation 6 | Origin of 12-TET and harmonic analysis in a Le Châtelier’s evolutionary system Δ

If we wish a good musical instrument, we need (Fig.1g(1)), just regard an instrument as a sting. It needs to oscillate into different frequencies with formula $\text{Wavelength} = 2L/n$, $\text{frequency} = nf_0$ in the figure. (This is for solo conditions. For ensemble state, “n” will larger than 1 such as n=2L, 3L, 4L, … KL, etc., the formula still works.) However, this is just theoretical wavelength and frequency formula, which can be extended upward and downward unlimitedly in an isolated system. In a real condition, we need the actual performance equal to the theoretical frequency in certain accuracy; the “n” spectrum in the formula which satisfies such requirement will be the quality of a musical instrument. E.g. one instrument can perform in the range from n=1 till n=6 spectrum with tolerable deviations equal to the theoretical frequencies, another instrument can perform from n=1 till n=12 spectrum with tolerable deviations equal to the theoretical frequencies. We then believe the instrument with a wide performance spectrum n=12 is a good musical instrument. This refers to the quality of a musical instrument. For a musical instrument with the same quality, we still can tune it into certain frequencies then make the performance spectrum wider than with other spectra. 12-TET is originated in this way; just find the mathematical “common multiple” we then can gradually get Chu’s constant $^{12}\sqrt{2^{n-1}}$ which can assure the least inner resistance; the least inner resistance just means maximum splicing state, or all the issuing surface tension regions can express their inversions. (For an instrument with the n=6 spectrum and an instrument with the n=12 spectrum, we can simply say that n=6 spectrum has more inner resistance than that of the latter. Inner resistance can also be demonstrated into the unevenness of interference pattern, as in the right bottom of (Fig.1f) we can see such unevenness of interference pattern.)

For cells and other biomaterials in bio-systems, the harmonic requirement is the same, albeit all the bio-materials binding more parameters than that of a musical instrument. We can roughly use a similar method in which people work out the 12-TET to analyze the system condition; this way we call it harmonic analysis.



Copy number of MPP = 7, ref.to (Fig. 1i(5))

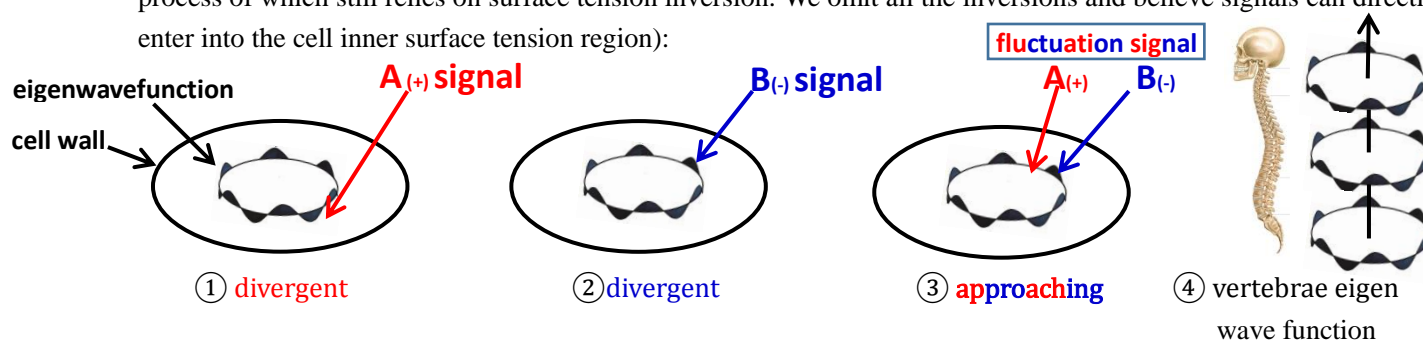
Origin of harmonic superposition “n” and $^{12}\sqrt{2^{n-1}}$

The left figure is a hematopoietic stem cell map. We can see, MPP differentiate into CLP and CMP. Take subscribe to designate the frequency of certain cells in the map, we could quickly get $f_{CLP} = f_{CMP} = \frac{1}{2}f_{MPP}$ without any considering of the mechanisms among them and the size or mass weight of any of these cells. Similarly, we also can get $f_{GMP} = f_{MEP} = \frac{1}{2}f_{CMP}$ and all other frequency relationships, and finally get the frequency map of the whole hierarchy (Note: this is not a single frequency, it is the frequency energy ideal ratio. E.g. $f_{GMP} = \frac{1}{2}f_{CMP}$, f_{GMP} has a series of values from f_{GMP_1} to f_{GMP_N} , f_{CMP} has a series of values from f_{CMP_1} to f_{CMP_N} , the equation just means their ideal running ratio for all the $n=1$ to k). No matter the hierarchy map is for cells, genes, RNAs or even tissues, if the hierarchy relationships from experiments are correct, then the frequency acquired from the harmonic analysis will be correct, especially at the younger stage. For an *in vitro* hierarchy, we can't do such analysis since the movement relationships are randomly controlled by diverse factors. However, once such hierarchy relationships are *in vivo* which have survived from the evolution, we can then perform such analysis without any difficulty. As mentioned before, life evolution is to strengthen such harmonic relations by means of inversion. And only such relationships can assure the least inner resistance or maximum inversion.

The right figure is the modulation of the origin of the quantum number “n” and the “integer variable” Chu's number $\left\lfloor \sqrt[12]{2^{n-1}} \right\rfloor$ in a harmonic system by light slit-diffraction. We could see the quantum number “n” is a “regenerative number” with a limited linearity range; each component contributes for “n”, the increasing of the slit number strengthens the “n” and the linearity range. What among the “n” part is the “integer variable” part. In the experimental range, the more of the n (numbers of slits), the more that the “integer variable” will close to $\left\lfloor \sqrt[12]{2^{n-1}} \right\rfloor$. This experiment can also be performed on a liquid surface. This figure vividly demonstrates the n and $\left\lfloor \sqrt[12]{2^{n-1}} \right\rfloor$ relationship a harmonic approaching system.

Supplementary Explanation 7 | Cell migration model based on upgraded Newtonian motion & rest concept Δ

It will be quite difficult to take a conventional Newtonian system to model cell migration. For non-living beings, rest & motion concept just means whether there is a force to change their inertia state. An ideal rigid body system will be 100% sensitive to whether such a force is present or not, and also such a force is easily isolable. For living systems, motion & rest becomes an anti-unitary superposition concept. (One discernable signal is more "stationary" than another discernable signal, just means based on the superposition structure, the superposition strength of one signal is stronger than that of another signal, and they compose of anti-unitary relationships or fluctuation & stationary interactions; the leaving of another signal will make this signal automatic get compensation from the system by Le Châtelier's effect, thus contribute to the stationary strength of this signal in a certain range. Such compensation could be regarded as a process of the polarization of gravity.) Following is a cell migration based on the upgraded rest & motion concept (For all the signals, only discernable can enter into the cell, and the process of which still relies on surface tension inversion. We omit all the inversions and believe signals can directly enter into the cell inner surface tension region):



As in the figure, for a discernable signal “A”, if it finally attains the strengthening part of the inner surface tension region or eigenwavefunction, it is a divergent signal; for a discernable signal “B”, if it finally attains the weakening part of the inner surface tension region or eigenwavefunction, it is still a divergent signal. (Such

strengthening and weakening come from the whole system instead of certain structures.) Only when a signal composed of both A & B, and they attain the inner surface tension region or eigenwavefunction, A activates strengthening part and B activates weakening part, means the effect of both A & B follow the whole inner surface tension region or eigenwavefunction pattern or fit the previous “memory”, as in ③, the system will approach this signal. This is actually a more general signal “superposition” and also a very general cell migration model. (Suppl. Movie 6.0) demonstrated such a model. From this model, we could understand how “fluctuations” & “rest” drive a bio-system. This is the simplest signal superposition model. For advanced species as in ④, follow the same way. Just different bio quantum paths receive different signals and finally get a holistic “divergent” or “approaching” state. The human spinal cord is the upgrading of this simplest cell migration model. Note: this general cell migration model can work for microcosmic as well as the macrocosmic world, providing the superposition fluctuation can be established. (Suppl. Movie 6.1) shows a real single cell migration GFP image. This means the governing factor of cell migration is a collective *in vivo* environment instead of individually. Diverse conventional cell migration models can’t explain such surface tension driven movement, only this based on strengthening & weakening effect cell migration model can. This is also the difference in the migration model between living (multi-surface tension) and non-living beings (single surface tension). (Suppl.Exp.9-12) can supply much evidence for our cell migration model; an egg is a big cell; both of them use the same way for collecting signals.

Supplementary Explanation 8 | Technical and system challenging of stem cell therapy ▲

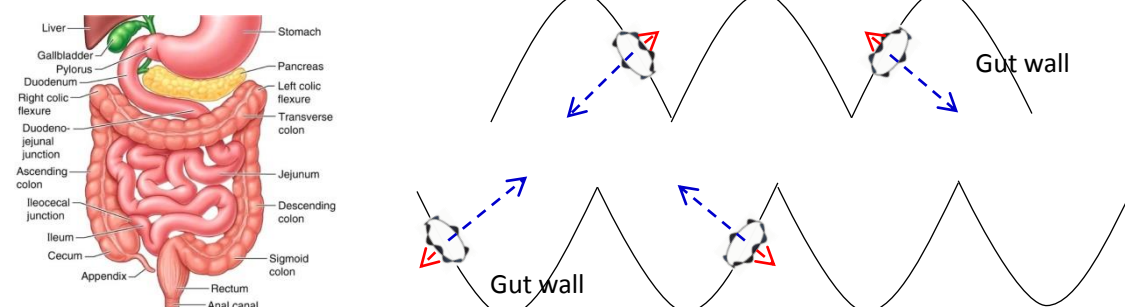
There are three major technological restrictions for stem cell application. ① The source and quality of the stem cells. ② The holding of the stem cells. ③ The time of the therapy. The sources of stem cells which can be applied for medical therapy are actually very limited, if we take later *in vivo* splicing number or oscillation frequency spectrum as a quality standard as in (Suppl.ExpL.5). Stem cells are cells which superposed by non-stem cells, or the stationary structure of non-stem cells. Therefore, some claimed sources of stem cells, such as diverse artificial induced stem cells, or cells isolated from non-bone marrow structures such as hair follicles, adipose tissues, etc., are less likely to be an effective source. They only can supply research materials, even if being “identify” as stem cells, the real physical oscillation spectrum of them are quite narrow for therapy. For cell lines which cultured in labs for a certain period, a similar problem will present. Car-T is also not solved this problem, cells cultured outside not only fail to get sufficient ingredients than those of *in vivo* but also fail to get the oscillation superposition from other types of cells; therefore, oscillation spectrum is inevitably quite narrow, even if we make some transgenic modifications for these cells will not be effective. Most of the results from the Car-T publications are just stories. The only effective source for stem cells is actually bone marrow or from the spinal cord. Such a source is very limited since the *in vitro* amplification is impossible, and also restricted by the donor’s age and health condition. Most importantly, different from that of blood donation, such operation has a severe impact on the donor’s health and lifespan. (As mentioned before, the time in bio-systems is commutation time which needs to establish in a long period. Donation for bone marrow or CSF directly reduces the commutation time, and also the receiver can only recover a small part of the commutation time. This can also be understood by gravity binding; donations mean losing of substantial gravity binding. We should understand that the bone marrow or spinal cord can become an effective source is actually due to the spinal cord is the only stationary or superposition structure in the body. Therefore, the stem cells from there possess the full oscillation spectrum in this region. This is quite easily validated by experiments, just take vertebrates such as rats, dogs, sheep, etc., let them donor bone marrow with human medical technology, we could easily see how faster is the decaying of their health condition and lifespan with the number of donations. I have reviewed the bone marrow donation consent documents of more than thirty hospitals in all developed countries. None of them write down the fact of lifespan impact of bone marrow donation, just use a lot of official languages to cover the fact. For those who never get decades of medical

training will be impossible to know the fact after signing.) For the above reasons, the medical source of stem cell technology is actually still totally unsolved nowadays. I personally even believe we should regard human bone marrow as an immoral medical technology that shouldn't be advocated since it fails to deal with the lifetime value of donor and receiver equally. And the efficiency of transfer bio-inertia for this technology is quite lower. The storage of stem cells is another unsolved problem. Every cell has certain oscillation frequencies; fridge or liquid nitrogen storage is actually decaying such oscillation frequencies. The best storage technology for stem cells can't over three years. So the storage of umbilical cord stem cells is actually an immoral project. The organizers world-widely just claimed that the storage of umbilical cord stem cells could prepare for future use and advocate people to pay a storage fee for decades. However, all the cells in the liquid nitrogen will die within three years; therefore, such operations are still unsolved problems that exist there only for commercial interests. (As mentioned before, there is time commutation in the three-dimensional oscillations of bio quantum paths. Liquid nitrogen decays such time commutation, therefore inevitably decay the bio-inertia; thus this technology can only store biomaterials in a very short period. We also need to note that the quality of umbilical stem cells is actually not sufficient for medical use even freshly prepared. Their oscillation spectrums are quite narrow than those of original ones. So this is a charlatan commercial operation from the very beginning. Stem cell research in the lab is important; however, such significance can't justify out-lab charlatan operation.) For the stem cell therapy time, only at a very early stage there exist limited effects. (refer to empirical evidence of **Suppl.Exp.14**) Organ transplant is also a technology with very limited effect. As mentioned before, cancer is due to bio-system constant K divergent. Once metastasis, most patients generally can't live for more than 5 years. For organ transplant patients, it is almost impossible to get an organ in which time commutation is the same. To adjust the different commutation time will cost a lot of bio-inertia, or the surface tension from the transplanted organ only partially can connect with the surface tension of the body. Therefore, most organ transplant patients' survival time is similar to that of cancer metastasis patients, less than 5 years. Both of them are life functioning under system constant K divergent states.) China has taken the organs of death penalty people for the long term and large scale trials since the 1980s, the results are not ideal. It is definitely not due to the quality of the source organ and the technological level of the surgeons; it is just due to the methodological limits of the organ transplant technology. After two decades, the law in China even banned such secret experiments since people already know that's really not the future of medical sciences from the poor results. In other countries, there are still many people who advocate or work for this industry; however, the statistical records of the survival period of those who get organ donation are not available; that is possible for preserving this industry. We should understand it is an abnormal medical technology which not worthy of advocating since even the best organ transplantation operation can't avoid the patient's constant K divergent states. And if we can put organ transplant into clinical trials for diverse "must transplant problems" evaluated by survival period, we could find that even neglect of phase I, then phase II, and phase III will be quite difficult to get enough survival times. (The phase I trial is for healthy people, transfer organs to healthy people that averagely still have 50 years of lifespan, will cut down their lifespan to within five years, and also takes the risk of operational failure; therefore, it is impossible to trail for healthy people as the regulated. Actually, even just from the fact of inadmissible of phase I clinical trial, we could know it is indeed an abnormal technology, just an idea that can't pass clinical trials from various aspects, even difficult to initiate an animal clinical trial.)

Supplementary Experiment 15 | Challenging experiment for conventional nutritional theory, food digestive surface tension or gravitational inversion model ▲

The conventional theory claimed various nutrients, and diverse "imaginary" nutrient fact tables that were quite challenging to verify have been put on various food packages. The basis for such kind of model is from "unlimited uninstall & reinstall" of biological structures, which is contrary to the surface tension region quiddity of life. We can see

a simple example, if we have a big machine or a mechanical robot needs to pass a small gate, we just uninstall them and make the parts pass the door and reinstall again will be OK. Since there is no Le Châtelier's effect in the system; therefore, we uninstall and reinstall them will not damage the structure of the device. Conventional nutrition theory is imaginary model from here, since we know proteins are composed of amino acids, starch is composed of small chains of saccharides and fat is composed of fatty acids and glycerol, etc., then we arbitrarily assume that food first decomposes into these ingredients and absorb in the gut, no real empirical evidence. We eat food mainly for the surface tension region or gravitational binding inside foods; the imaginary model can't work. There are three challenging experiments for conventional theory; first, it is quite difficult for animal digestion reaches the level of amino acids or sugars as claimed; chyme is just a mixture in which the percentage of "conventional ingredients" is quite lower. Second, if we put all the claimed nutrients into intravenous fluids and supply to animals and not give them food, they will finally weaken to death. The third challenging test is what we do here. We use rat experiment; the control group just feed normal commercial food pellets and experiment group takes the same pellet food but mechanically blends to powder. Each group with 12 eight week rats, 4 rats/cage, also two extra cages which were added later after finding hungry rats will eat each other, every extra cage with one mother rat and 4 baby rats, all other conditions keep the same. Just one week, the treatment group will begin to dislike the blended food, later diverse mal-nutritional problems begin to present. On day 32 began to kill and eat each other. For the extra treatment cage, on day 43 the female rat with four babies began to eat its own babies due to hungry. The treatment groups have ample supply of water and blended food or enough supply of conventionally claimed "nutrition" ingredients; however, due to these blended foods can't supply enough gravitational binding, they still hungry. Such experiments can perform for board animals include human beings; humans still can't digest and absorb surface tension or gravitational binding from blended food that "structures" or surface tension regions have been damaged, even with all the nutrients claimed by conventional theory. Following the conventional theory, blending will increase the specific surface area of food ingredients; therefore, it should increase absorption efficiency. However, the experiments show reverse results. This means what animal digest and absorb into the body is the "structure" of the food nutrients instead of the nutrients themselves. (Binding gravitational waves can be transferred in small range without restrictions, what transfer in people's hug behavior still binding gravitational waves. The only factor that impacts the transferring of binding gravitational waves is still the surface tension polarization rate. For a bundle of correlated surface tension regions, binding gravitational waves can automatically polarize to higher percentage areas or in one surface tension region tend to the thinnest area. All the biological functions are based on such property of binding gravitational waves, albeit it only at a polarization speed of 200m/s, far less than of the emission gravitational waves. We still need to



know, "correlated surface tension region", not necessary means they correlated right now, any historical surface tension region which has inversion relation with the issuing surface tension region will possibly polarization. This just means in a small range, binding gravitational waves possibly cross surface tension regions and tend to the historical signal.) Once we know the characteristics of binding gravitational waves, it will not difficult to know digestion. As in the figure, nutrients can be modulated by bio quantum path surface tension regions:

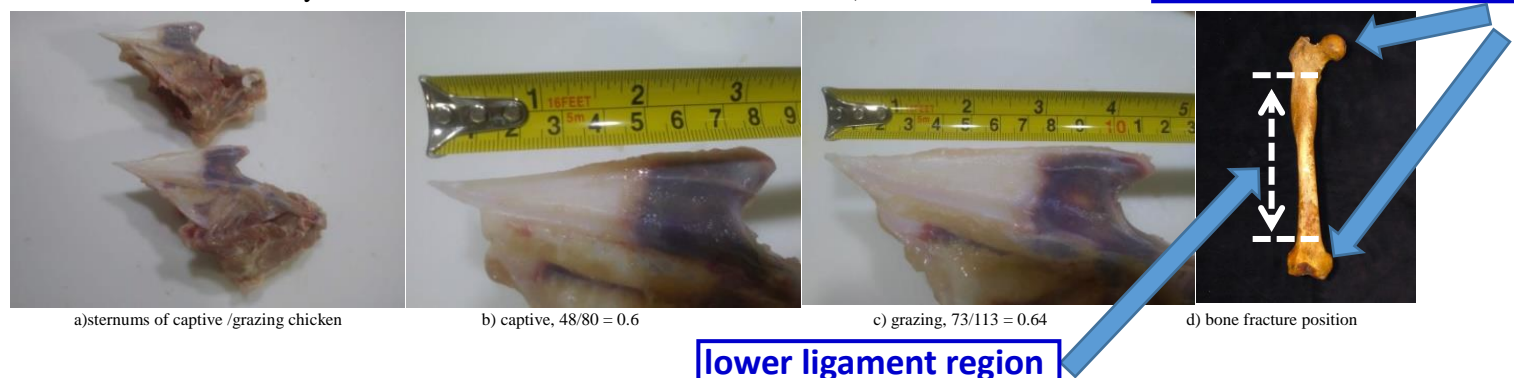
All the digested nutrients get two forces, one is a blue inward force and another is a red outward force, and the

net force is inward as in the figure. In the chyme or digested liquid, higher surface tension digestion parts always on the top to contact the gut wall so we can modulate in such a way. Digestion just inversions of these bio quantum paths, not only inverse into the gut wall but also establish relay or harmonic inversion cascade to absorb gravitational binding to the body, the blue colored vectors exchange with the red colored vectors. (We have mentioned relay inversion before; it means each surface tension region inversion one by one. Harmonic inversion means there are jumps among these surface tension regions and not follow relay inversion sequence. Just like we play a piece of music, relay inversion means notes play on a scale; harmonic inversion means diverse combinations of music note not follow the scale sequence. However, such a “jump” must be regulated by the harmonic system, so we call it harmonic inversion.) Digestion first and foremost absorbs gravitational binding from food, nutrients just subordinate. All the processes of digestion follow the Principle of Least Action, and the inversion of absorption similar to the photoelectric effect on the metal surface; gut peristalsis plus diverse enzyme activates the inversion, similar to photons activate the electron binding forces inversion. (The rat experiment just damages gut inversions.)

Peristalsis is a general phenomenon that means gravitational binding boosts in certain conditions. We can go back to (**Suppl. Movie 1.1**) to observe the ancient boxing; it includes some “peristalsis movements” that similar to gut peristalsis; even for the cell migration in (**Suppl. Movie 6.1**), we carefully observe some region still can find peristalsis movement. Definitely, for ancient boxing or cell migration, we can only get occasional peristalsis movement; gut can holistically issue peristalsis movement for an hour since it gets gravitational binding from the foods, and ancient boxing only adjusts the inner gravitational binding. The performance standard of ancient boxing is still how much “body peristalsis movements” it can issue. Ancient people say “體勁可濟日月壽長”, just means the health benefit from “body peristalsis” even much more powerful than those from the Sun and Moon (Sun & Moon are total training basis.). From here, we can understand that ancient boxing tries to acquire more gravitational binding, different from modern boxing tries to defeat opponents without considering the hurt of their body gravitational binding. Observing a mouse brain with the “fresh observation” method in (**Suppl. Exp. 8**); mouse brain cells possess much more “peristalsis movements” than the cells from other tissues of the body. This observation only refers to macrocosmic tissues, if we can observe microcosmic conditions such as DNA, RNA, etc., the rule of “peristalsis movements mean a bio-inertia boosting state” still apply.

Technologically, different variety of foods has different strengthening & weakening effect on the body structure. Generally, staple food mainly strengthens the spinal cord; meat mainly strengthens the muscles and vegetables mainly strengthen CSF derivatives and diverse connective tissues (such as fasciae inside muscles and tunica vaginalis, etc.). Only at the constant K binding fast increasing stage need much meat foods, after a certain age should avoid meat foods. Staple food needs to keep the original binding and avoid seasoning; meat food needs more seasoning, veg between the two. However, all varieties are necessary and can't be fully separated. Human taste follows surface tension region polarization, still quite reliable for choosing food, especially for those who have had the spinal training. In Wudang Taihe, different kind of kungfu need a different kind of foods; however, rarely have meat, usually replaced by ligaments, especially the sternums. They believe that sternum can directly reflect lifespan; the sternum is one of the best foods, usually add many kinds of herbs. As in the figure, they believed the ratio of the white ligament to the dark bone sediment could directly reveal health and lifespan. We've performed a modern experiment following their idea in Beijing; we can directly measure such a ratio, which should be equivalent to our holistic horizontal / vertical transferring. We can see, for a captive feeding chicken in 12 months, the ratio is 0.6, and for another Chicken hatched in the same batch with around equal initial bodyweight (both male), the ratio enhanced to 0.64 just due to grazing. This experiment is performed in Beijing and the model fit for board animal species; just for other mammals, we can't directly get the ratio (ref. of **Fig. 1j**①, n=4); have to separate and weight the ligament part and the bone part of the sternum. In modern times, we do can roughly calculate R_{hv} of the sternum in such a way. For bone fractures, only these in the middle region of a bone which

ligaments are less can be recovered by fixing technology. If a bone fracture happens in the high ligament region, it will be quite difficult to recover. This means the recovery of bone fractures must rely on the ligaments system of the bone beyond the fracture position. This conclusion can be verified by modern animal experiments with various designs. Ancient people believe the above ratio of sternum controls all the ligament/bone deposit ratio of all the bones inside the body, so the sternum can reflect the health condition.)



There are thousands of conventional herbs and medicines in ancient Chinese medical sciences; most of them need to combine with food or physical training. Like the above case, sternum bone combines with many herbs (totally 108 and shifts with seasons and types of kungfu); this kind of concoctions are essential for advanced kungfu training, and while people success in advance level, do can prevent diverse senility problems such as hypertension, diabetes, cancer, etc.; however, for people have never gotten any training, such kind of concoctions will definitely no use for any of above problems. Ancient Chinese medical sciences always face similar kinds of problems; due to only validated by the people who get training, the medical effects of dealing with those who never get physical training are quite limited. Ancient Chinese people good at diverse medicines for curing bruises, sprains, muscular pain, muscular fatigue, lumbago, occlusion diseases, trauma bleed, punch injury, and rheumatism, etc., these medicines are acquired from their physical strike practice. Physical strike training sometimes can't avoid getting hurt, need some medicine for compensation; also, some people find some medicinal ointments blot on certain parts of the body can greatly benefit physical strike (like the Wudang converge, take a "mystery" medicinal liquor blots on the spinal region before training can shorten the time of requirement; definitely, some people don't use these medicine still can get higher levels of kungfu); these two conditions accumulated one thousand more medicines from dealing with physical training. And for these sorts of medicines, there is no big difference between those who get physical training or not, so they are quite effective; these types of ancient "physical strike derivative medicines" are quite unique and even exceeding than modern medical sciences for these sorts of problems. However, the remaining medicines become quite challenging to use for people who never get physical training, only occasional success cases. (For physical strike derivative medicines, what really effective is the physical training, the medicines only auxiliary. Once separated from the physical training, it will be quite challenging to deal with problems.) Also, ancient Chinese people failed to develop modern science. Therefore, lack enough technological controlling for contagious diseases. (In western countries, controlling contagious diseases was only in the recent century. *Yersinia pestis* was not known until 1895. It will not be odd that ancient Chinese people never knew such kinds of things. And the average lifespan of ordinary western people was still 30-40 years, even in 1850, similar to that of ancient China. The great lifespan increasing was around one century after that time point.)

Western medical sciences based on modern knowledge have contributed greatly to the lifespan of human beings. Most single factor foreign invading problems have been crushed by medicines like antibiotics, sulfonamides, surgical, etc., for at least 3 decades of lifespan increasing; however, for multi-factor internal induced problems such as hypertension, diabetes, AID (autoimmune disease), CHD (coronary heart disease), cancer, etc., western medical sciences even with so powerful of modern technologies still not so successful. In contrast, ancient

physical training developed one millennium ago becomes an effective solution for these internal problems. (The reason is possibly due to modern sciences not consider the physical parameters of the human body.) For those who can follow the physical training system step by step, it is zero risks for cancer. However, the ancient physical system needs people to participate in long term physical training. Western medical sciences from the very beginning are in the philosophy which the patients do nothing but pay money. Is there anything available which can combine advantages of both; such as like western medical sciences, no need of patient doing anything and just pay money; also get the results of decades' ancient physical training? We yet have no answer to this question since it is the dream of humankind; it has to be replied by every one of humankind.

In Wudang Taihe (and also some other ancient Chinese physical systems such as Shaolin); besides the food mixed with certain herbs, the best food is actually "air". People gulp a large amount of air every day by the "gulping air technology" and then benefit to health. Air has no solid or liquid nutrients; however, it can induce the gut movement, and similar to all other foods; it takes the inversion manner to pass through the gut wall. It can't offer any chemical or biological defined nutrients to the body; air in the gut also doesn't like air in the lungs can offer oxygen; however, it does offer surface tension region or gravitational binding efficiency to the gut and even to the whole human body. We eat food for somatic and mental gravitational binding or surface tension; gulping air can equivalently offer gravitational binding, thus composed of the basis for kungfu training. It is estimated for those who are training kungfu, 1/3 of the gravitational binding comes from foods, and 2/3 of the gravitational binding comes from gulping air. Gulping air can't be used without any food or water for the long term; however, combine with foods, it will issue a large amount of gravitational binding to the body. (Bigu or Taoist fasting is a kind of routine ancient technology without eating food and only gulping air in a certain period, generally lasts for two weeks. Long term Taoist fasting is usually less than three months; therefore, gulping air technology can't be used without food or water for more than three months.) Shaolin gulping air technology is separated from physical training processes in the morning; Wudang gulping air technology is integrated with the kungfu training processes; no big difference and all for more gravitational binding. It just needs to avoid within half an hour before or after eating or drinking. This technology is not specifically present in some human beings; in the animal kingdom, there are still diverse animals include some lower evolved species possess it.

Supplementary Explanation 9 | Physical training system of Wudang Taihe



Wudang Taihe was established by Kunlun Deng (1400-1499 CE), he was the student of SanFeng Zhang. Till now, it has been found for 590 years. The major technologies include four parts: gulping air, physical strike, Wudang (spinal) converging, and sexual control. As mentioned before, gulping air technology can greatly increase the surface tension region acquired from foods. For physical strike, almost every part of the body can be systematically training, even including places such as human eyes and testicles, have very detailed physical strike methods. Wudang converging and Shaolin converging are two sets of important technologies that follow the evolutionary trend. (Sexual control technology is critical to ensuring the success of all training. For modern people not training for kungfu, there is no need for any controlling; however, for those hope to reach advanced kungfu level, that is a must.) My "Shifu" Ke Ping Fan is the generation 13 chief ("Shifu" is the teacher who trains Kungfu in ancient China). He has two rooms in a building full of ancient books, artifacts from Wudang Taihe. (He had only trained around 1/3 of the entire catalog. I personally only trained 1/10 of his kungfu. However, without such training, it will be impossible for me to write this paper.) Attached supply the full catalog of all ancient Wudang Taihe at the end of this section, also include the chief of each generation. From the full catalog, my Shifu Ke Ping Fan published 37 books in 1989 with modern Chinese language which he had trained or believed useful for modern people. (I saw these books in Tsinghua University Library. However, the problem is that the whole set of published books even didn't refer to the Wudang converge. There are also hundreds of versions of Shaolin published books;

also, none of them referred to Shaolin converge. These core technologies need decades of preparation training; without enough preparation training, they will be dangerous to untrained people. This is possibly the reason why they not present in published books.) Later, a new version published again in 2008. (All these published books were only elementary and intermediate levels and not included the advance levels even for the same types of kungfu in the catalog.) Since the full catalog is supplied for historians and archeologists, not interpret into English. And for such kungfu names, it is also difficult to interpret. We supply the full list since Wudang converge and Shaolin converge are potentially impact on the future of humankind profoundly. However, the entire system is for professional people; for ordinary people who have only limited time for training, ancient boxing is one of the good choices. (The whole set of the professional training system is not easy. In the beginning, the “Shifu” will tell you “筋骨多易練，韌帶難成”，“三年可得外堅體，十年可得內氣貫”。These two proverbs just mean, to training for muscle, skin, and bone is easy, to training for myelin sheath, fasciae (ligaments among muscles), and spinal marrow is difficult; three years can resist for blunt strike, it needs ten years to resist for sharp strike. Albeit the proverb says ten years, in Wudang most people need two decades’ training to resist for the sharp strike.) For compromised training, there is a lot of kind of ancient boxing styles; generally, need three years of diverse Wushu training (same with modern boxing) then gradually shift to a certain style. That is to train the peripheral part of the body first then shift to train the eigen part of the body. In Wudang, there are many styles of ancient boxing or weapons; most of them need to open the hip joints first. One of the ancient boxing called Taichi is for secular people since it only required the least religious forbiddance. For modern people who lack time, just Taichi combine with modern sports is possibly the right choice; just most people even don’t know that Taichi needs first open the hip joints. However, if people really hope to deal with cancer, the training to the Shaolin or Wudang converging level is a must. (As mentioned before, stationary and motion are inseparable; therefore, Taichi as training for CSF needs to combine with other peripheral training. Even Taichi itself has normal training (Suppl.Movie 1.1) and attacking training (Suppl.Movie 7.7), and also never separates from the physical strike. The Taichi training that most people take is just compromised parts for secular people. There is a branch called Qigong in recent decades; it also only takes the eigen parts of Kungfu and discards the peripheral training; finally, some Qigong people even become charlatans. The charlatan problem can’t be avoided in all cultures and disciplines. Charlatans have two characteristics; first, it only takes “easy parts” from a system and then incomplete; second, it is present for “easy to acquire short term” commercial or other interests. As the examples of the umbilical stem cell storage, CCR5 embryonic editing, and diverse Qigong branches, all possess the above two characteristics.)

*** Each generation of Wudang Taihe chiefs (From 武当真傳)

Name		Historical record	lifespan
Kun Lun Deng	鄧坤倫	1400—1499	99
Zhao Zhen Deng	鄧兆貞	1470—1572	102
Qing Lin Deng	鄧慶麟	1499—1597	98
Xiang Xian Deng	鄧光祥	1540—1638	98
Zhi Jun Deng	鄧志周	1608—1709	101
Fa Wu Deng	鄧霽吾	1646—1745	99
Yue Ji Deng	鄧越極	1662—1759	97
Yi Bing Deng	鄧亦炳	1700—1801	101
Yin Kui Deng	鄧雲魁	1740—1839	99
Zhong Shan Deng	鄧鍾山	1798—?	
De Gui Li	李德貴	1847—1936	89
Song Ru Li	李松如	1888—1988	100

(We only get the historical record for chiefs. Not counting the generation 10 chief lacks historical record and generation 13 chief still alive, the average life span is 94.8 ± 3.47 , no cancer or other modern senility problems. And in the same historical time, the lifespan of average people in China is around 30-40.)

*** Full catalog of Wudang Taihe Kungfu (Grant by Ke Ping Fan at 2008 in NanJing, China)

武當太極門全藏古籍書目

- 編號 1: 《太極圖說·秋本介八段內月圖說》1 卷，豐埒倫著
- 編號 2: 《太極圖說·秋本老八段內月圖說》1 卷，豐埒倫著
- 編號 3: 《太極圖說·秋本七十二地龍水周天內月圖說》1 卷，豐埒倫著
- 編號 4: 《太極圖說·秋本三十穴天宮八卦內月圖說》1 卷，豐埒倫著
- 編號 5: 《太極圖說·秋本寒吟版功八功夜梨內月圖說》1 卷，豐埒倫著
- 編號 6: 《太極圖說·秋本寒吟版功十穴水子梨內月圖說》1 卷，豐埒倫著
- 編號 7: 《太極圖說·秋本寒吟版功七十二地龍鐵吊衫內月圖說》1 卷，豐埒倫著
- 編號 8: 《太極圖說·秋本尺鈞墜底一百單八梨內月圖說》1 卷，豐埒倫著
- 編號 9: 《太極圖說·秋本轟天龜日月量三圖內月圖說》1 卷，豐埒倫著
- 編號 10: 《太極圖說·秋本五鳳齊鳴變微亦全三十穴功夜梨圖說》1 卷，豐埒倫著
- 編號 11: 《太極圖說·秋本五鳳齊鳴變微亦全七十二水子梨圖說》1 卷，豐埒倫著
- 編號 12: 《太極圖說·秋本五鳳齊鳴變微亦全三十穴天宮合七十二地龍子夜陰陽一百單八梨圖說》1 卷，豐埒倫著
- 編號 13: 《太極圖說·秋本龍升天保三十穴天宮內月圖說》1 卷，豐埒倫著
- 編號 14: 《太極圖說·秋本輕身騰躍七十二地龍內月圖說》1 卷，豐埒倫著
- 編號 15: 《太極圖說·秋本陰陽吟墜一百單八功夜合形內月圖說》1 卷，豐埒倫著
- 編號 16: 《太極圖說·秋本陰陽合形一百單八履水內月圖說》1 卷，豐埒倫著
- 編號 17: 《太極圖說·秋本太極吟坐跌手圖說》1 卷，豐埒倫著
- 編號 18: 《太極圖說·秋本神元陰陽五功手圖說》1 卷，豐埒倫著

編號 19:《太極圖說·秋本外內十二功圖說》1 卷, 豐埜倫著

編號 20:《太極圖說·秋本解內開門圖說》1 卷, 豐埜倫著

編號 21:《太極圖說·秋本累砂迷魂手圖說》1 卷, 豐埜倫著

編號 22:《太極圖說·秋本紅砂身魂手圖說》1 卷, 豐埜倫著

編號 23:《太極圖說·秋本五差斷魂手圖說》1 卷, 豐埜倫著

編號 24:《太極圖說·秋本五差壘塔萬手圖說》1 卷, 豐埜倫著

編號 25:《太極圖說·秋本禪代五差代形代手圖說》1 卷, 豐埜倫著

編號 26:《太極圖說·秋本禪代五差龜符圖說》1 卷, 豐埜倫著

編號 27:《太極圖說·秋本太極十三勢圖說》1 卷, 豐埜倫著

編號 28:《太極圖說·秋本太極外手圖說》1 卷, 豐埜倫著

編號 29:《太極圖說·秋本太極乾坤新圖說》1 卷, 豐埜倫著

編號 30:《太極圖說·秋本太極外手圖說》1 卷, 豐埜倫著

編號 31:《太極圖說·秋本老當中踏虎圖說》1 卷, 豐埜倫著

編號 32:《太極圖說·秋本中踏虎手圖說》1 卷, 豐埜倫著

編號 33:《太極圖說·秋本四門單刀圖說》1 卷, 豐埜倫著

編號 34:《太極圖說·秋本雁尾槍圖說》1 卷, 豐埜倫著

編號 35:《太極圖說·秋本雁門槍圖說》1 卷, 豐埜倫著

編號 36:《太極圖說·秋本老當君子新說》1 卷, 豐埜倫著

編號 37:《太極圖說·秋本太極形新圖說》1 卷, 豐埜倫著

編號 38:《太極圖說·秋本白蟻蟻舞鐵棍圖說》1 卷, 豐埜倫著

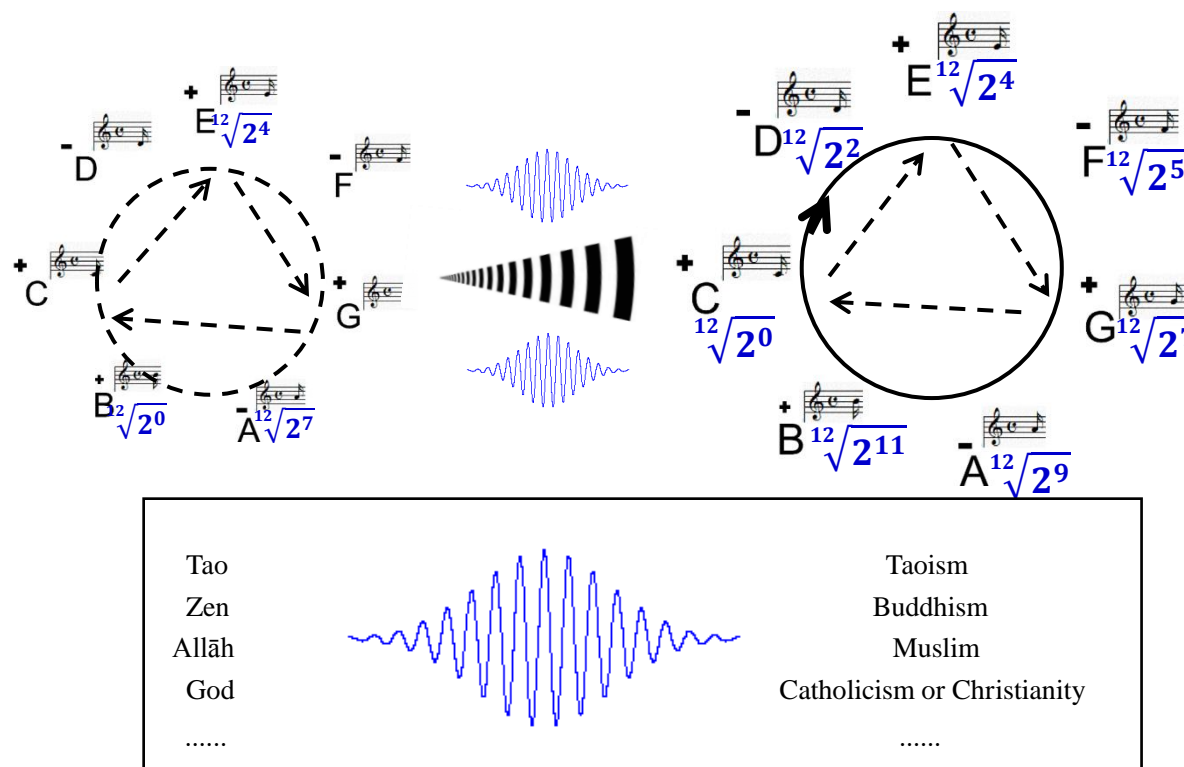
編號 39:《太極圖說·秋本酸中跌八鷹圖說》1 卷, 豐埜倫著

編號 40:《太極圖說·秋本鳳羽裡象圖說》1 卷, 豐埜倫著

- 編號 41:《太師廟典·秋本青翠雁月刀圖說》1 卷, 豐埒倫簡
- 編號 42:《太師廟典·秋本鸞鳳金鐵圖說》1 卷, 豐埒倫簡
- 編號 43:《太師廟典·秋本機爭隱形鐵圖說》1 卷, 豐埒倫簡
- 編號 44:《太師廟典·秋本神環然乎飛祥圖說》1 卷, 豐埒倫簡
- 編號 45:《太師廟典·秋本三十穴陰陰圖說》1 卷, 豐埒倫簡
- 編號 46:《太師廟典·秋本七十二祀神圖說》1 卷, 豐埒倫簡
- 編號 47:《太師廟典·秋本曉外預修一百單八乎機圖說》1 卷, 豐埒倫簡
- 編號 48:《太師廟典·秋本推演淺夢圖說》1 卷, 豐埒倫簡
- 編號 49:《太師廟典·秋本藥物采集粉性圖說》1 卷, 豐埒倫簡
- 編號 50:《太師廟典·秋本百蟲訓微圖說》1 卷, 豐埒倫簡
- 編號 51:《亦明肅神卷御總奇門承器對觀》1 卷, 豐埒倫簡
- 編號 52:《亦明肅神卷老嵩山真庵向豐埒倫譜長重修太(周)子勳圖譜》
- 編號 53:《亦明肅神卷老嵩山真庵向重修神譜乎內外篇秋本》不分卷, 陳名簡錄
- 編號 54:《亦明肅神卷老嵩山真庵向重修乎陽縣洪銅縣奏譜長短八極秋譜》1 卷, 陳名簡錄
- 編號 55:《亦明肅神卷老嵩山真庵向重修乎陽縣洪銅縣奏譜長穴合乎秋譜》1 卷, 陳名簡錄
- 編號 56:《亦明肅神卷老嵩山真庵向重修乎陽縣洪銅縣奏譜長門肅秋譜》1 卷, 陳名簡錄
- 編號 57:《亦明肅神卷老嵩山真庵向重修乎陽縣洪銅縣奏譜長於九輪秋譜》1 卷, 陳名簡錄
- 編號 58:《亦明肅神卷老嵩山真庵向重修乎陽縣洪銅縣奏譜長鋒魔福秋譜》1 卷, 陳名簡錄
- 編號 59:《亦明肅神卷老嵩山真庵向重修乎陽縣洪銅縣奏譜長葵青肅秋譜》1 卷, 陳名簡錄
- 編號 60:《亦明肅神卷老嵩山真庵向重修乎陽縣洪銅縣奏譜長穴合輪秋譜》1 卷, 陳名簡錄

Supplementary Explanation 10 | Converging transferring (R_{hv}) of the spiritual world and somatic structures, eigenbelief of the validate-able somatic religion [Δ](#)

We have mentioned relay inversion and harmonic inversion before, we can simply believe that memory is the relay inversion on the spinal cord and thinking is the harmonic inversion on the spinal cord; however, thinking has been inversion again to the brain and memory still remain on the spinal cord, albeit complex memory and thinking are always entangled together (the saltatory conduction of myelinated neurons is a kind of harmonious conduct effect, it definitely composes of board inversions, just *in vivo* sampling is too challenging). Thinking can't be separated from the religion, all the spiritual world (memory & thinking) can be written into the same inversion map as in the figure.



In the figure, we only write down the inversion or eigen part and omit the binding part which the eigen part resides on. Just from this simple figure, we could understand that warship symbols such as God, etc., just represent the eigen signals for the later spiritual world. Diverse rituals and myths just offer people the original converging patterns; then the later spiritual world can add memory based on the patterns. Due to both the spiritual world and the somatic structures possess a wide spectrum, the “equal converging pattern” requirement is achieved by the maximum effective superposition region (a few vertebrae) on the spinal cord. As in (Fig.g, h) of (Suppl.ExpL. 4), CSF integrates two parts together by surface tension or gravitational polarization. The above belief symbol is just the least surface tension or gravitational binding which can be recovered, or memory is the least superposed surface tension signal that can be recovered under certain conditions. Like all the biological processes, thinking and memory are still driving by gravitational binding polarization.

All religions over the world, even include the scientific kingdom, arts, and politics, are training via the spiritual world. (This means the effective superposition region is still not changed, only limited to a few vertebrae no matter how these disciplines are running.) Only Wudang Taihe is an exception, train both the spiritual world and somatic structures by the Wudang converging (Fig.2b(5)). This system can expand the effective superposition region of the spiritual world & somatic structures on the whole spinal cord (higher level people can attain the whole spinal cord region); therefore, greatly develop human life potential. We can call such a physical training system as “somatic religion”, all over the world only Wudang can be called the “somatic religion”. Started from SanFeng Zhang, Wudang began to advocate the fusion of three major religions. Different from diverse other religions with

certain classics or diverse scientific disciplines have a lot of written theories; somatic religion believes that every people could develop his or her own systems in a lifetime based on all available info. The higher level he or she can train for somatic structures (such as how well can perform the posture in **Fig.2b⑤**), the well of the system he or she can develop. So this discipline never has classics like other disciplines, only somatic training system; therefore, people can train somatic structures from such a system and then develop their own theoretical system from the “theoretical raw materials” of any other available disciplines. The only “somatic religion” in the world can exist in China is not accidental; started from Jiahu bone flute, some ingredients had already begun to present, then gradually evolved out the “somatic religion” 590 years ago. The “God” and “Goddess” for this discipline are Sun and Moon. Since for physical training, the Sun and the Moon are the maximum controllable impacts on our body; a lot of training designs based on them. (Albeit at that time, people had already known the Milky Way and diverse constellations, the effect of utilizing them as reference for kungfu training was inferior to that of the Sun and Moon.) They admire the one who attains a higher level of Kungfu. (This way is similar to modern science. The belief of science is validate-ability; people admire certain scientists only because their theories are the most validate-able format to satisfy the curiosity of people at that time, not because someone can summon the “spirit of science” louder than others.) “Dragon worship” is originated from here. Dragon is one of the 12 Chinese zodiac animals; all the other animals exist in nature; only Dragon is legendary. It is an imaginary creature based on the morphology of the human spinal cord with the least attached structures. Other animals have more attached structures; therefore, they can’t match Dragon in somatic and spiritual power. (Both Shaolin converging and Wudang converging are physical training system which maximizes the spinal cord issue for bodyweight and minimizes the help of attached structures of the body, incorporated this belief so well.) The earliest jade Dragon artifact presented in Hongshan culture (4700 BCE), and even before that time, the totem “Dragon” was associated with the emperor and imperial power. While people use Sun and Moon as reference for kungfu training, the success of the training is reflected in the spinal cord. The function of the spinal cord to the human body is like that of an emperor to a country. Even today, Wudang still calls all the training for the spinal cord as “train the big dragon”. The well of the training of the spinal cord means the higher of the kungfu, then get more respect. We mentioned “somatic religion”, it is actually a “spinal cord religion”. The quiddity of “dragon culture” is “spinal cord” culture. Therefore, the establishment of Wudang Taihe in ancient China is not accidental; it does possess a profound historical basis.

Wudang system mainly composes diverse spinal cord training technologies, and every disciple needs to develop one’s own system based on the spinal cord training. Not like other religions, the belief is from Bible or something imposed by other people; the belief in this religion comes from people’s own validation in the physical spinal training system, not something imposed by other people; anything without validation can’t be called a belief and seeking of truth is a lifetime career. Due to absorbing diverse theories, it can tolerate any theories, doctrines, beliefs, etc. However, such “tolerance” is still quite intolerant to those who fail to deal with the lifetime value of people equally. E.g., one Buddhist religion in Tibet, use alive human skin to make the Thang-ka. (Little girls are cheating into the temple, cut out the tongue to avoid lying since lying is believed impurity and will impact on the



a) human skin Thang-ka



b) human skull instrument



c) human bone horn

quality of “products”; till 16 then make into Thang-ka. First drawing on skin with Thang-ka pattern, cut a hole on top of the head and infuse mercury, mercury with higher density will separate the skin from the body; finally, the entire skin is taken off; and after the skin is taken off, the girl still not die immediately.) This religion doesn’t deal with equal life value for people; some people’s life is sacrificed for the benefit of others, albeit they believe in the value of their sacrifice. For the inequality of life practice, everything from this Thang-ka cult is forbidden to use.

We must understand, any religious beliefs or scientific disciplines, or any technological practices, at any conditions must base on the equal life opportunity for everyone; develop our own system must strictly follow this rule. (Modern stem cells or organ transplantations do hide some risks of breaking this ethnic rule if not carefully handled. As mentioned before, only *in vivo* fresh stem cells have enough oscillation spectrums for limited medical use. People intentionally “ignore” this hard fact and advocate stem cell therapy is tampering this ethnic rule.)

In the long history of human evolution, civilizations always included both scientific as well as religious components. In European countries, science divorced with religion a little time before the Newtonian Times; then religion still keeps its absolute authority manner which nothing can be doubt and validated, you can’t make an experiment to validate whether God exists or not, you also can’t doubt authority of Bibles, Ten Commandments, etc.; science keeps a new manner which everything can be doubt and need enough validation (even under today’s technological level something gets validated, in the future while technology advances, it still needs validation again; this means science composes of eigen-validation). Historically, there were conflicts between science and religion; today, they no longer interfere with each other again, just you keep your absolute authority, and I keep my validate-able authority, albeit some scientists believe in God and some religious people study science. (Gregor Johann Mendel, the founder of genetics, is a religious person.) However, the somatic religion of China is unique; it is the only validate-able religion in the world. It’s a religion, but everything of it still needs validation, not like other religions worldwide, not tolerate any validation. Or we can say, this unique religion has never divorced with science from thousands of years ago till today, they cohabit together in the whole history. (The Needham puzzle just wonders why the industrial revolution didn’t originate in China since all the technological conditions had already well prepared. Now we can understand it was due to there is no divorce from science and religion; the industrial revolution did require the divorce of science from religion; therefore, we can’t see some “divorced format of science” in China. However, somatic religion is a validate-able discipline; it possesses the components of science, a lot of big engineering presented in ancient China still can be regarded as another format of the earlier industrial revolution.) We also understand, Dragon as a worship symbol has already included technological components. The worship symbols of other religions can be genuflected by all the people without technological restrictions, just with absolute authority and no doubt. However, spinal cord training to the level of Wudang converging or Shaolin converging level needs decades of time that not everyone can attain; this means technological components have already incorporated. This also means that belief is lifetime practice, not something imposed by others, or something can easily indoctrinate to others (In some religions, we usually see that some people not really believe in God but become a pastor, make-up pious to God, indoctrinate to others, and raise money. Belief integrated with technological components does avoid such kinds of things.); lifetime practice composes of belief; we can call this eigenbelief; eigenbelief is the sort thing that needs eigen-validation. (As mentioned before, all “eigen-” process in bio-system is for more surface tension; not only a DNA sequence or a protein can get more surface tension by eigencycle but also a human belief still can do the same things. Human thinking is a surface tension converging process; eigenbelief means lifetime practically increases the surface tension of a belief, or equivalent to enhance the connotation or binding of a belief. Actually, each religion is different from other religions only because religion relies on absolute authority, and the God of each one is different. The reason for various “Holy wars” is actually due to the incompatible of different “God”. However, once the God of any religion becomes a validate-able symbol, it will possess an eigenbelief format and no reason for a Holy war.)

Today, if some people bring something from religion to science, due to damage to the validate-ability of science, it is unacceptable. Also, science can't enter into religions due to damage the absolute authority and piousness. However, if we bring something from the "somatic religion" to science, that should be acceptable since the unique somatic religion is establishing and developing from practical validation from the very beginning; therefore, what brings to science is still belonging to the same "validate-able system", never damages the validate-ability of science. Scientists are humans by nature; they need to make a living and generally dislike touching an experiment that takes decades to get significant results. Under such conditions to bring some historical evidence to scientific study is acceptable. This paper only brings the ancient spinal training system, not refer to religion, and all write down on the paper still continuously subject to nowadays and future positivistic validations.

Only refer to the spiritual world; there are many philosophies in the world that historically be classified into two major categories as "materialism" and "idealism". Based on the above "maximum effective superposition on the spinal cord" model, we could write them into the equation as, $(\text{materialism}) \cdot (\text{idealism}) = (\text{maximum effective superposition on the spinal cord}) = \text{constant K}$, different people just with different "materialism" and "idealism" ratio on the spinal cord. We can see, this formula is somewhat similar to Heisenberg's uncertainty principle in classical quantum mechanics. However, classical quantum mechanics presents a pure 100% idealism explanation which contrary to its uncertainty principle, "observation collapse wave function". Actually, the so-called quantum is a kind of surface tension frequency energy which different from the indiscriminate energy we usually see. (Like a chicken, if we give it small heating, the energy will be transferred into surface tension energy or bio quantum paths inside its body, then it will feel happy; however, once heating is over the transfer tolerate limit, it will then unhappy or even be toasted. Bio-systems can only utilize surface tension energy.) Its stability depends on the inversion stability, which oscillates from other correlated quantum. Only when the inversion capacity of a quantum is damaged, then it will collapse, never concerns with observation. The quiddity of the wave function is just superposed bio quantum paths.

Supplementary Experiment 16 | NKT clinic cell therapy for cancer patient after-operation-recurrence inhibition, the real cause of tumor recurrence and the concept of "spinal cancerous recurrent factor" Δ

Following our model, known acquired immunological reactions are equivalent to binding network hierarchy terminal reactions; macrophages, T cells, etc., fighting for the invaders means the binding network hierarchy copy number increase; such network activation will also polarize the inversion process or gravitational binding of the whole network; that is the innate immunity; finally all the innate immunity must rely on the spinal cord. The spinal cord supply inversion capability for all the networks. Cancerous cells have their memories on the spinal cord.

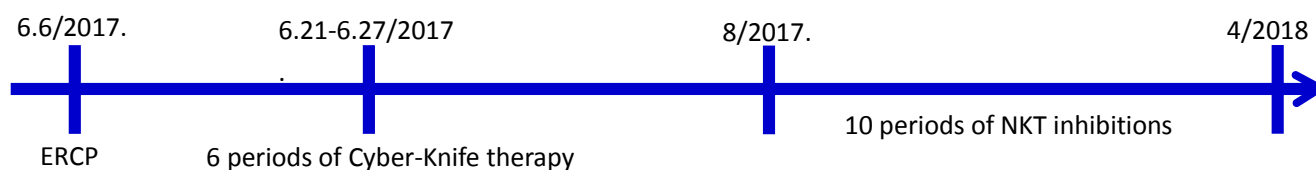
Tumor cells not just certain chemical or biological definitions; all these definitions must finally represent by incorrect physical converging patterns or inversion frequencies for the system. From this model, cancer is finally a physical spinal cord problem, not just a certain chemical or biological defined tumor genes or tumor cells growth in the body. Cancerous factors include two parts; one part is the tumor cells or solid tumors in the body; another part is the conjugating "tumor recurrent factors" on the spinal cord. No matter which method we use to deal with the tumor cells or solid tumors in the body, we still need clean the conjugating "spinal cancerous recurrent factors", albeit nowadays medical sciences have never realized that and totally lack technologies to deal with these "recurrent factors" on the spinal cord. So-called (molecular) targeted therapy, targeted drug delivery, "precision medicine", etc., are historical disciplinary misconceptions which unknown of the spinal physical functions. (We try to study this molecule or that biomarker which can induce cancer, from a tumor specimen, we only can get to know the final higher expression genes, actually lack information of how these final profiles establish; know the final profiles precisely not mean can "cure", only know the whole driving forces for these final profiles can offer substantial help. And all these driving forces are from the spinal cord, far beyond the reach of nowadays "precision

medicine". Spinal controlling of inner molecules is a natural interference process instead of human biased interference. Technologically speaking, cancer (molecular) targeted therapy must possess two conjugating targets; one is the conventional target; another is the conjugating target on the spinal cord, without the target on the spinal cord, recurrence will be uncontrollable.)

Dr. Minghua Zhang got a similar pattern from his research and publications¹⁻⁵; he believed that NKT cells are finally from the spinal cord and compose of the innate immunity. Therefore, he designed the following clinical trial for cancer patient after-operation-recurrence-inhibition. Here "after-operation-recurrence-inhibition" is intended to remove "spinal cancerous recurrent factors", this is definitely the first clinical trial in the world to do so.

Nowadays, a lot of medical technologies can deal with cancer; can be classified into three categories as surgical treatment, radiotherapy, chemotherapy. (We call all the process use available proper technologies to deal with certain cancer patients as "operation".) The problem is after an "operation", in one to a few years, cancer will be recurrent uncontrollably. This trial uses NKT cells to inhibit cancer patient after-operation-recurrence-inhibition. The donation of the stem cells comes from the family; most cancer patient over fifties, then their sons or daughters or close family relations should have the most closed related genetic composition, then donation come from these people on consent. There are three key points of the clinical trial, which all have been verified by animal experiments in our lab before. First, as mentioned before, liquid nitrogen storage impacts on the stem cells; therefore, all cells are a fresh donation, can't be stored. Second, the cells come from bone marrow donation. (As mentioned before, the only bioactive stem cells which can attain the therapy oscillation spectrum is from the living bone marrow or the spinal cord. Diverse umbilical blood cord stem cells or are just a commercial story, no use for therapy. Various induced pluripotent stem cells are also published stories, no use for therapy, and even have higher risks of inducing tumors than natural stem cells.) Third, the collected stem cells can't be amplified in vitro, also need CSF activation. Artificial *in vitro* amplification of stem cells can't offer oscillation wave function as the CSF to cells; therefore, the cultured cells physically lack enough oscillation spectrums, even can't satisfy by the immune system from the same people. Also, as mentioned before in the paper, CSF derivatives possess critical roles in human physical control at diverse levels from the cytoskeleton till the spinal cord; therefore, donated stem cells also need CSF from the same donator for activation before injection. Albeit CSF amount is small, such kind of activation should be critical for the stem cells' performance after infusing into the patient. No artificial CSF or wave function available; therefore, the trial has to rely on donated CSF even if the wave function is not in an ideal state. Now we offer a few reports as examples: (Case reports are from Medical Center, Tsinghua cell therapy, Dr. Zhang's lab, Medical Science Building B343. We must emphasize that organ transplantation is totally different from stem cell therapy; organ transplant can't pass phase I trial. Organ transplant for a group of healthy people will greatly impact on their lifespan; therefore, organ transplant is only a clinical trial inadmissible emergency technology. However, diverse stem cells can pass the phase I trial since healthy people get stem cell injection will not impact on their lifespan severely, albeit stem cells still full of a lot of unsolved issues. As a research method, it is at least much better than the so-called organ transplantation. The following are from our phase II clinical trial.)

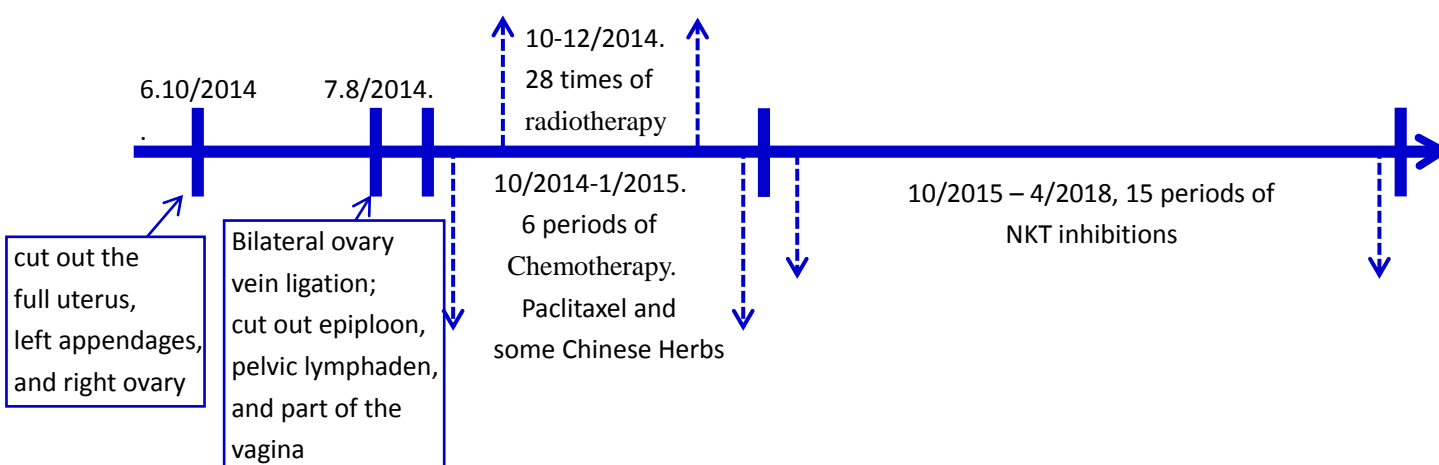
NKT after-operation-recurrence- inhibition case 1(for a Cholangiocarcinoma patient)



In the cell inhibition period, tumor marker monitor, CA19-9 $\ll 10.0 \text{ u/ml.}$, CT image doesn't show tumor

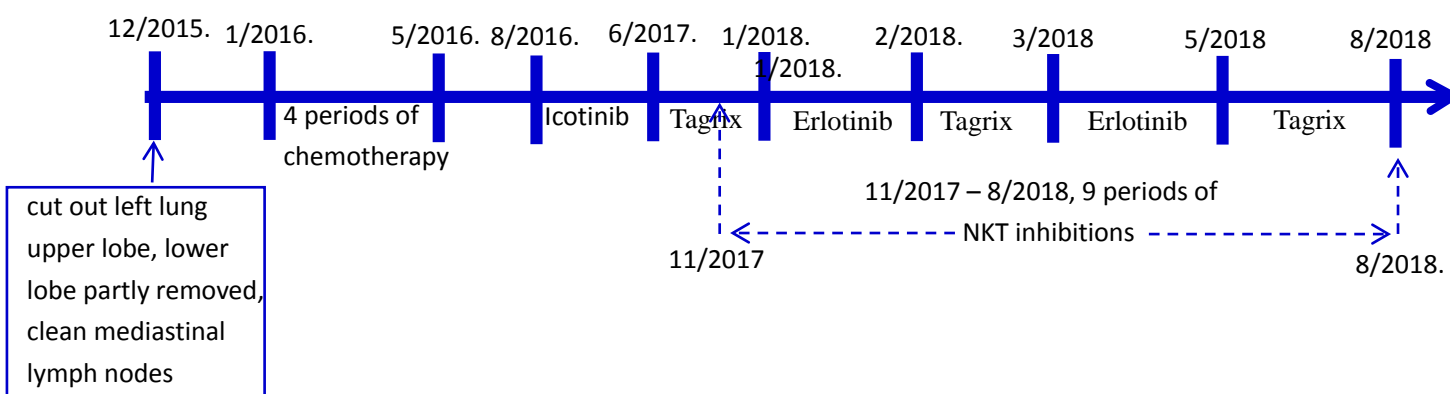
expanding.

NKT after-operation-recurrence- inhibition case 2(for an endometrial carcinoma metastasis patient)



In the cell inhibition period, tumor marker monitor, CA125 $\ll 35.0 \text{ u/ml}$ and CA19-9 $\ll 34.0 \text{ u/ml}$. CT image does not show any further metastasis.

NKT after-operation-recurrence-inhibition case 3(for a lung cancer metastasis patient)



In the cell inhibition period, tumor marker monitor, CEA, CYFRA21-1, and NSE are in the normal range. SCC increased in the March of 2018 and then fell back in Aug. of 2018. In the surgical period, the patient had already present liver and brain metastasis. In the cell inhibition period, CT image not shows the expanding or metastasis of focus.

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The above three cases are positive results till now; there are 17 cases of positive among totally 58 cases of diverse tumors. All these already done clinical trials have specifically chosen metastasis patents which conventional medical sciences have no way to deal with. This proves that our “spinal cancerous recurrent factors” conjugating model is correct: cancer recurrence or metastasis factors are on the human spinal cord. The remaining are negative results; NKT cell therapy failed to inhibition the after-operation-recurrence for the remaining 23 cases. However, this doesn’t mean our model is incorrect; it just means NKT cell therapy is not a complete method for removing “spinal cancerous recurrent factors”. It still needs to find better ways to deal with these “recurrent factors”.

If we following the conventional clinical standard, this result should be effective; however, following our new definition of cancer, this method fails to fully interfere on innate immunity or the spinal cord. There are a lot of

biomarkers and definitions for cancer in modern medical sciences; the final diagnosis standard is still tissue biopsy since all the biomarkers have substantial errors. And no biopsy parameters refer to the cancerous factor on the spinal cord since CSF is not an anatomical structure. Also, there are around 300 anti-cancer drugs that have passed FDA clinical trials and gone to the markets. (<http://pharmaknow.com/list-of-anti-cancer-drugs-approved-by-the-fda/>). However, most of the clinically approved candidates are statistical stories which only evidently enhance the patient's lifespan for a few months. This means these drugs or chemotherapy can only interfere with the terminal part, such as certain genes, cells or biomarkers, etc.; still fail to repair on the spinal cord. Once the cancerous parameters from the spinal cord begin to proliferate, these drugs begin to fail. (Among so many approved anti-cancer drugs, only a few such as Gleevec can substantially increase "the five-year survival rate". [Gleevec is orally used for chronic myelogenous leukemia CML) and acute lymphocytic leukemia (ALL) that are Philadelphia chromosome-positive (Ph+), certain types of gastrointestinal stromal tumors (GIST), hypereosinophilic syndrome (HES), chronic eosinophilic leukemia (CEL), systemic mastocytosis, and myelodysplastic syndrome.] Possibly the cancer types that Gleevec deal with concerned with the spinal cord in the least degree, then it could become prominent among so many anti-cancer drugs.) Surgical removing of cancerous tissues is also evaluated by the "five-year survival rate". This means "surgical removing of cancerous tissues" is equivalently failed on the spinal cord. We remove certain cancerous tissues in the body still not touch the cancerous parameters in the spinal cord; therefore, few years after the operation, once the cancerous parameters in the spinal cord begin to proliferate, cancer will get a recurrence.

Several cancer immunotherapy agents that target the PD-1 receptor have developed and passed clinical trials. These drugs still only refer to acquired immunity models and never concerning with the spinal cord. The NKT stem cell tumor-after-operation-inhibition clinical trial in our lab is different. It is possibly the first one in the world which tries to take innate immunity or spinal cord functions for cancer metastasis inhibition, so we report it here. (Right now we actually lack effective medical methods to interfere with the human spinal cord unless long term ancient physical raining. Ancient physical training is not regarded as a medical interference by modern society. And all the available cancer theories, drugs and clinical trials have never concerned with the spinal cord functions. NKT is the only one. About stem cell therapy, there are still many unsolved problems. As mentioned before, both bone marrow and CSF transplantation technologies are potentially inducing issues of failing to equally deal with the life value of people since they do significantly impact on the lifespan of people. However, this clinical trial is the first one in the world that refers to the spinal cord functions; even with some potential problems, we have to report it. All over the world, those who advocate the applications of stem cells always neglect the same types of problems. (I personally have also mentioned these problems in the lab; however, people in the lab believe this is also a research project, and "spinal cancerous recurrent factors" are critical enough to neglect these problems.) For this clinical trial, if not considering the availability of stem cells and the new definition of cancer, it still can make a "statistical story" of improving the survival period of the patient in certain degrees like most of the regulatory approved anti-cancer drugs; just following new definition, it fails to fully solve the cancerous factors on the spinal cord or medically repair the damaged spinal cord as expected. Also, we should know if following the new standard, more than 99% of FDA clinically approved anti-cancer drugs need reconsideration since none of them refer to the human spinal cord. According to the new physical model of cancer, any tumors on the certain parts of the body must accompany with conjugating parameters on the spinal cord. No cancer can be independent of the conjugating factors on the spinal cord.) Moreover, we should realize that many scientific study stories of "cancer earlier detection" still face the challenging of physical (the spinal cord) or chemical interference difference. Even if we find some "earlier detection", if we can't simultaneously find the conjugating cancerous factors on the spinal cord along with the actual tumors we found on the certain non-spinal region, and also get rid of these factors, we still can't "cure" the problem. No matter earlier detection or later detection, the critical challenging is still on the spinal

cord and how to correct the physical problems of the spinal cord. Fail to repair the issues on the spinal cord physically; even so-called earlier detection will not solve the problem or increasing the actual survival period.

This NKT clinical trial uses a physical cancer model; however, the interference method still belongs to chemical or biological or combined. For physical interference, right now the only available methods still a long term systematic physical training, no quick method like take a pill which no need of the patient to do something. Refer to the above clinical trial, after an operation, what the patient needs most is to recover the innate immunity or the spinal cord converging pattern to inhibition the cancerous cells with a deformed converging pattern. However, for people who have never gotten an ancient physical training, it has been too later to arrange any physical training due to age and damaged body structures. Ancient boxing is not enough; too later physical strike technology also not enough; people need at least can perform the Shaolin converging or Wudang converging position for two hours every day to preclude cancer. This level of physical capability generally needs decades of ancient training and impossible to arrange for the cancer patient with old age and deformed body surface tension regions. (Any physical training can only strengthen or maintain certain surface tension regions by means of horizontal & vertical transferring before they have broken, for already broken surface tension regions, physical training can't repair them again.) For people got systematic physical training before, he or she will not become a cancer patient.

For those who get ancient physical training and finally attain the level of Shaolin converging or Wudang converging level, they will be lucky to reduce cancer risk to zero. However, for those who fail to access such a system before and also get cancer at an older age; to add some physical medical interferences into nowadays chemical or biological-based medical systems is a kind of dream for medical science. To achieve this dream, for chemotherapy, we need an anti-cancer drug which can chemically remove the cancerous factors on the spinal cord then combine this "super spinal cord agent" with all the approved chemotherapy drugs nowadays; or each clinically approved drug finds its own "spinal cord repair agent". For surgical treatment, besides certain medical procedures, we still need to repair the cancerous problems of the CSF. Only surgically removing of certain tumor tissues or cells and fail to physically repair the conjugating issues of the CSF; it still can't solve the problems of cancer recurrence and metastasis, such "compromised" ways which never refers to the spinal cord can only offer some statistical stories to satisfy the regulatory requirements as what happened in today's clinical trials. (Statistics can only tell a drug is significant or not for certain cancer; it can't tell us whether this drug increases the cancer patient survival time for three months or three years in real conditions. Also, it can't tell us whether the "significance" of the anti-cancer drug is from the action on the tumor or the action on the conjugating "spinal cancerous recurrent factors". Just from the later applications of these approved drugs, we could know, almost all of them fail to crush recurrence.) Radiotherapy is still not validated for its medical significance, albeit it is widely applied. Most of the radiotherapy methods are even methodologically irrational. The basis for radiotherapy is that people believe surgical treatment can't clean the tumor tissues or cells, then the radiation can help "clean" the escaping tumor tissues or cells. People also believe that the cause of tumor recurrence is due to these "escaping tumor tissues or cells". Following our model, the real reason for tumor recurrence is the cancerous factor on the spinal cord and not these "escaping tumor tissues or cells". If we can't remove the physical "recurrent factors" on the spinal cord, radiotherapy is almost no use. (Cyber-knife has a different mechanism with that of the radioactive "clearance", just the surgical process is replaced by accurate radiation; therefore, more rational for medical use than conventional radiation. However, it claimed to remove the solid tumor tissues which size lower than 2cm with accuracy attains a single cell's size still difficulty in crushing tumor recurrence. This fact again proves that "recurrent factors" are on the spinal cord, not the "escaping cells" in conventional theory. Cyber-knife world-widely has indisputably proved our conclusion!) Until now, the only effective way which can interfere with the human spinal cord is by means of ancient physical training. As the possible replacements for such long term physical training, the "super spinal cord agent" and "human CSF repair" we mentioned are still in the idea stage which the future is totally unknown.

Repairing human CSF is too challenging for nowadays technological levels. Albeit modern science has exponentially developed so many new technologies, ancient physical training is still an unsurpassable technology for human spinal cord interference since none of these later developed modern technologies can interfere with the human spinal cord to the level of precluding the “spinal cancer recurrent factors”. And the “spinal cancer recurrent factors” should be physically modulated by the frequency notation with a converging pattern we mentioned before. In a large binding network, the wrong inversion frequency on the hierarchy root part will make the whole network continuously induce cancer recurrent factors, which modern biotechnology can't deal with right now.

Ref. from Dr. Minghui Zhang which issue the clinical trial design

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Supplementary Explanation 11 | The mechanism of gravitational bindings in multi-surface tension region system modulated by Maxwell's equations (divergence theorem) for horizontal & vertical fluctuation

If we want to change Newtonian physical parameters into surface tension parameters, we need to take a bio quantum path as a “quantum” or a wave function is enough. Classical quantum mechanics just claims the “wave function collapse” to a certain value. However, in bio-systems, all the bio quantum paths always with certain kinds of $|z+|/|z-|$ ratios for existing, we can call them as “existence ratio” or “wave function collapse ratio”. Now, the concept of “wave function collapse to certain values with probability” is upgraded into “wave function or quantum collapse to certain ratios in surface tension region”; life can then survive for its lifespan by exchanging or shifting the $|z+|/|z-|$ ratios of various surface tension region bio quantum paths at diverse levels once sustaining signal is available. (From human CSF, we can clearly see how the ratio is maintaining.) In classical physics, Maxwell's equations are a model that fit for a novice as well as an advanced level people, and we've mentioned “Maxwell's demon” before, so we start the discussion from it, the set can be given as:

Integral equations

$$\textcircled{1} \oint_S \mathbf{E} \cdot d\mathbf{S} = \frac{1}{\epsilon_0} \iiint_V \rho \cdot dV$$

$$\textcircled{2} \oint_S \mathbf{B} \cdot d\mathbf{S} = 0$$

$$\textcircled{3} \oint \mathbf{E} \cdot d\mathbf{l} = \frac{\partial}{\partial t} \iint \mathbf{B} \cdot d\mathbf{S}$$

$$\textcircled{4} \oint \mathbf{B} \cdot d\mathbf{l} = \mu_0 \left(\iint \mathbf{J} \cdot d\mathbf{S} + \epsilon_0 \frac{\partial}{\partial x} \iint \mathbf{E} \cdot d\mathbf{S} \right)$$

Differential equations

$$\text{or} \quad \nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$$

$$\text{or} \quad \nabla \cdot \mathbf{B} = 0$$

$$\text{or} \quad \nabla \times \mathbf{E} = \frac{\rho}{\epsilon_0}$$

$$\text{or} \quad \nabla \times \mathbf{B} = \mu_0 \left(\mathbf{J} + \epsilon_0 \frac{\partial \mathbf{E}}{\partial t} \right)$$

Eq. ① means the electric flux through the boundary surface $\partial\Omega$ can be given as the total electric charge density of the volume enclosed by this surface; it is a kind of space integral to surface integral transferring geometry. In contrast to Eq.②, the magnetic flux through an enclosed boundary surface becomes zero. This is due

to magnetic flux can't be asymmetrically present in an enclosed surface. (There is a monophyletic group of bacteria called magnetotactic bacteria that have organelles called magnetosomes to accumulate magnetic crystals genetically. For them, Eq.② possibly needs to be modified; however, for the remaining bio-systems, this equation is correct.) Maxwell's equations partially come from: $\iiint_V (\nabla \cdot \mathbf{F}) dV = \oiint_S (\mathbf{F} \cdot \mathbf{n}) dS$ which is known as the more general Gauss's divergence theorem; the latter not just refers to the electric field and magnetic field; any kind of flux can be modulated in a similar way. Writing the theorem in Einstein's notation:

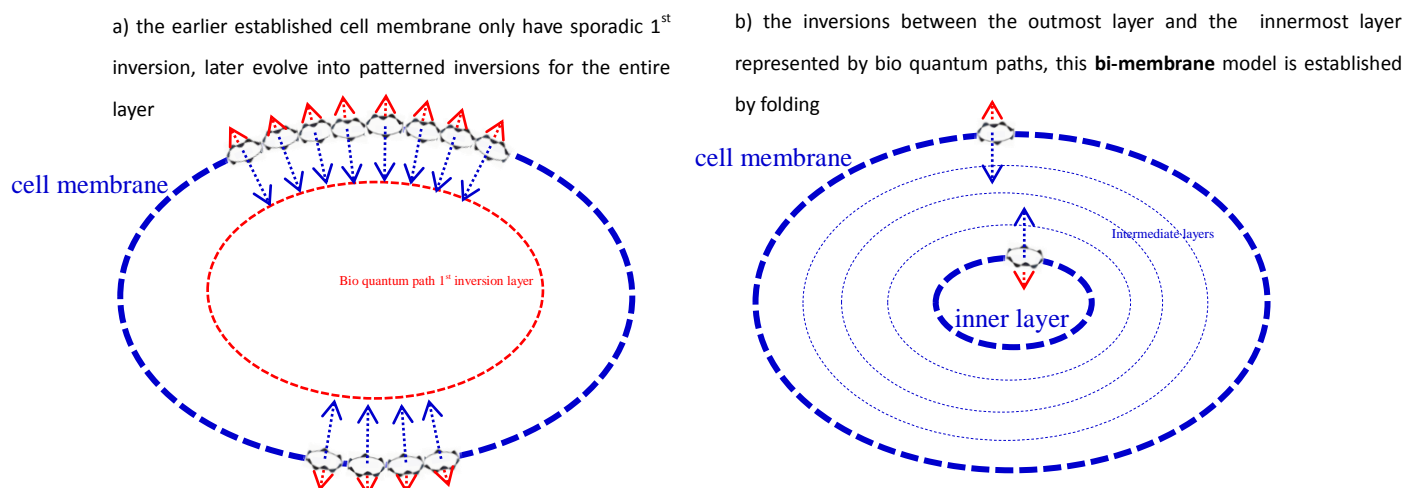
$$\iiint \frac{\partial F_i}{\partial x_i} dV = \oiint F_i \cdot n_i dS$$

Replaced the vector field \mathbf{F} with a rank- n Einstein's tensor field \mathbf{T} , this can be generalized to:

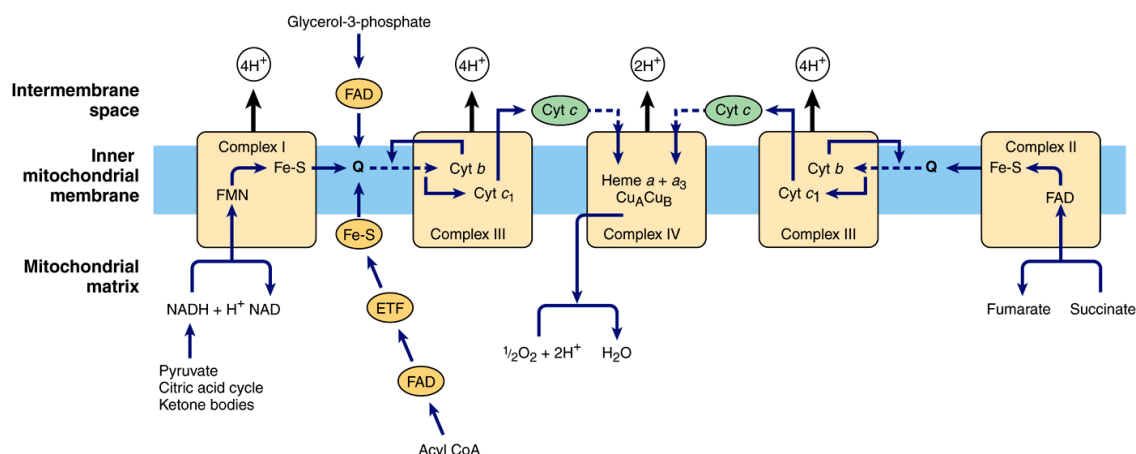
$$\iiint \frac{\partial T_{i_1 i_2 \dots i_n}}{\partial x_{i_q}} dV = \oiint T_{i_1 i_2 \dots i_n} \cdot n_{i_q} dS$$

No matter which format of the above equations, they just describe the flux transfer from volume to the surface, which is fully agreed with the evolution tendency: polarization at the surface tension region. Just in these equations, the transfer is absolute and the surface thickness is zero; however, in life-systems, the transfer needs certain commutation time and any surface tension region possesses thickness which can be expressed into one or more surface tension regions. Like the process of digestion needs 2-4 hours to get all the surface tension regions from the food by peristalsis. (With the senility, the efficiency of such transfer is gradually decaying. Young people can get most of the surface tension regions from the food mixture and deliver to the inner multi-surface tension system of the body, and older people can only acquire a small number of surface tension regions from food, and their inner surface tension percentage is also decaying.) We even can regard all the above equations and their similar as an ideal condition and define the parts which fit for those equations as surface tension regions; then the surface tension region percentage is the parts that fit for the equation to the total parts.

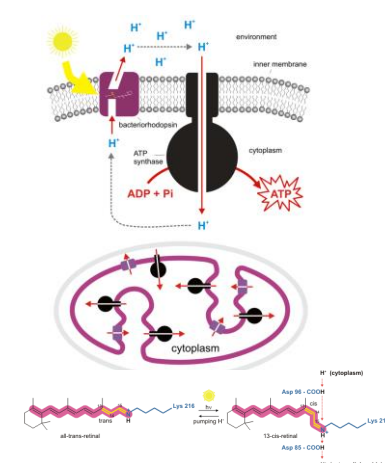
In Eq.①, it just says the total electric charge density of the volume enclosed by this surface, not clearly say positive charge and negative charge; however, it does connotation the positive charge and negative charge. The electric field has positive and negative charge then gets Eq.①, and a magnetic field generally lacks this property (for an enclosed surface, if there is one magnetic field line enters into the surface, it will then definitely run out of the surface.), it gets Eq.②. We can then generalize that **any influx with polarization will get the Eq.① and any influx without polarization will get the Eq.②**. A general polarization is a kind of fluctuation; we then can know that signal can fluctuate both on the surface and inner space will get Eq.① and those can't get Eq.②. From here, we can further understand the "bi-membrane model" we mentioned before in the (Fig.g) of (Suppl.ExpL.4).



c) respiratory chain, horizontal inversion on cell membrane



c) bacteriorhodopsin (primitive ATPase)

drives H⁺ inversion on the cell membrane

(Fig. a) shows an early membrane, it composes of a layer of bio quantum paths with diverse ratios in responding to various environmental signals. This layer of bio quantum paths has a “compromised 1st inversion region” represented by the red cycle. While outside signal reaches, it will make certain bio quantum paths inversion vertically to the red cycle; then horizontally transfer to other bio quantum paths in the layer. With evolution, further inversion layer gradually presented. (Fig. b) shows the eukaryotic cell bi membrane model, the outmost membrane and the innermost membrane compose of the inversion relationship as in the figure. Also, between the outer membrane and the inner membrane, there are many intermediate layers; each intermediate layer was gradually established by horizontal & vertical inversion in geological time. With them, the out cell membrane can exchange signals with the inner layer by inversion. (Suppl. Movie 6.0) shows the simplest cell migration model that omits all the intermediate surface tension signal transferring and the inversion processes. However, it does represent how signals transfer in the simplest bi-membrane model.

(Fig. c) shows a typical respiratory chain. It is in the cell membrane for horizontal inversion transfer; however, each complex is also included subordinate vertical surface tension regions. An earlier respiratory chain can be seen at (Fig. d); it composes of Bacteriorhodopsin on the cell membrane. Bacteriorhodopsin is a protein used by Archaea, esp. by halobacteria, acts as a [H⁺] pump to capture photo energy to move [H⁺] across the membrane out of the cell. The resulting proton gradient is subsequently stored into ATP. (Rhodopsin is a light-sensitive receptor protein involved in visual phototransduction which found in the rods of the retina. It is a GPCR belongs to opsins and should evolve from Bacteriorhodopsin.) All these processes are composed of profound horizontal & vertical inversion; proved evidence that most critical functions are first established on the membrane, and then gradually fold inside.

Maxwell's Eq. ③ describes the electric field induces the magnetic field and Eq. ④ describes the magnetic field induces an electric current. These two equations are conditional, just describe from path integral to surface integral transfer under certain conditions. In bio-systems, a similar process should be from DNA to cell membrane proteins. This “path integral to surface integral transfer” process is too complex to write into an equation. However, it does reveal that from path integral to surface integral still need fluctuation; this is why coded genes need to combine with palindromes for functioning. Also, the bio quantum path itself has already included path integral to surface integral transfer; it is a wave-shaped path but also on the surface of an ellipsoid and resonates with a larger structure. This is a perfect path integral to surface integral transfer, which needs the sustaining signal. The basis for Maxwell's equations is Gauss's divergence theorem. Bio-systems do follow this classical equation for their surface tension fluctuation transfer, just need to upgrade the single surface to multi-surface, and each surface layer composes of bio quantum paths. No matter in Gauss's divergence theorem and Maxwell's equations, all the

surfaces are ideal and thick-less; however, in bio-systems, each surface has its thickness, which can be modulated by the scale of bio quantum path z dimensional oscillation based on real measurements. In this modulation, both the actual measurements and theoretical calculations are more challenging than the original thick-less model; however, the tendency is the same, just from the volume integral to the surface integral, or from the path integral to the surface integral. From here, we can clearly see, life is not a special or odd thing; it follows the most general physical laws and just evolved from the single surface tension region evolved to the multi-surface tension regions. In contrast, Newtonian laws only describe the physics required by human engineering, actually less general than the laws that drive evolution. Physics refers to the surface tension parameters are more general in the universe than those of the latter, albeit they get less attention for various reasons.

As mentioned before, the gravitational polarization described by Einstein gravitational waves is too small, $\frac{\delta L}{L} < 10^{-21}$. This level of polarization equals to non-polarization to bio surface tension regions; following Eq.②, the gravitational flux should equal to zero. However, from (Suppl. Exp. 6-7), bio-systems follow Eq.①. This means the polarization rate of $\frac{\delta L}{L} < 10^{-21}$ have enlarged enough to produce resonating fluctuation on the surface membrane of a cell as well as the inner cell membrane. It is the resonance between the surface membrane fluctuation and the inner cell membrane fluctuation bind the gravitational waves. (In prokaryotic bacteria, there are no nuclear membranes; however, such resonance still happens.) Albeit Einstein's system not directly refers to surface tension regions, his field equation applied in cosmology get some solutions of the boundary of our universe. This means the tendency of the existing of the surface tension region of the universe. On Earth for life systems, we definitely can't say that certain surface tension region means the size of something. Whether the surface tension region of the whole universe in the astronomical scale can mean the size of the universe is still unknown. The advantage of setting polarization rate $\frac{\delta L}{L} < 10^{-21}$ is that Einstein's field equation becomes the basis of cosmology. Now back to our small scaled but higher polarization rate bio-systems. Due to the energy transfer in bio-systems needs inversion. Maxwell's equations or Gauss's divergence theorem could be modified as:

$$\oint \mathbf{G} \cdot d\mathbf{S} = \iiint \mathbf{I}_{inversion} \cdot dV$$

Here \mathbf{G} is the gravitational flux of certain surface tension with area \mathbf{S} . $\mathbf{I}_{inversion}$ is the strength of inversion happened in this enclosed space. Einstein's gravitational waves bind by the inversion strength of a series of surface tension regions in bio-systems. While inversion stops, life will be ended. (In Gauss's divergence theorem, there is no requirement of oscillation. Maxwell's equations make the theorem into oscillation since the electric field is a simple harmonic oscillation. Now in bio-systems, not only binding gravitational waves, any parameters with oscillations can be modulated in a similar way.) We even can say that $|z|/|z|$ inversion is the prerequisite condition for the existing of the bio quantum path; the reason has been hidden in classical quantum mechanics for a long time. Given a pair of operators follow $[\hat{F}, \hat{G}] = \hat{F}\hat{G} - \hat{G}\hat{F}$, if $[\hat{F}, \hat{G}] = 0$, they are commutation; if $[\hat{F}, \hat{G}] \neq 0$, they are not commutation. A typical example in quantum mechanics is, $[\hat{x}, \hat{p}_x] = i\hbar$, means they can't be measured simultaneously, that is the uncertainty principle. It also means the commutators have a common eigenvalue which can apply for quantum mechanics. The non-commutation item " $i\hbar$ " is then what quantum mechanics can target.

In bio-systems, things become quite complicated; "measure" means the interactions among various biomaterials. E.g. DNA \rightarrow RNA \rightarrow protein, we can say RNA "measure" DNA or protein "measure" DNA, or they measure each other with commutation inside. All these measurements take inversions, no matter which types of inversions. So the inversion of bio-systems or even non-living surface tension region equals the commutation relationship in classical quantum mechanics, just more complex due to constant k binding. In bio-systems, time is commutation time, which means all the biomaterials can "measure" each other by inversions.

The equations of commutators in classical quantum mechanics can be given as:

$$\begin{aligned} [\hat{A}, \hat{A}^n] &= 0, n=0, 1, 2, \dots, K, \quad [\hat{A}, \hat{B}] = -[\hat{B}, \hat{A}] \\ [\hat{A}, \hat{B} + \hat{C}] &= [\hat{A}, \hat{B}] + [\hat{A}, \hat{C}], \quad [\hat{A} + \hat{B}, \hat{C}] = [\hat{A}, \hat{C}] + [\hat{B}, \hat{C}] \\ [\hat{A}, \hat{B}\hat{C}] &= \hat{B}[\hat{A}, \hat{C}] + [\hat{A}, \hat{B}]\hat{C}, \quad [\hat{A}\hat{B}, \hat{C}] = \hat{A}[\hat{B}, \hat{C}] + [\hat{A}, \hat{C}]\hat{B} \\ [\hat{A}, [\hat{B}, \hat{C}]] &+ [\hat{B}[\hat{C}, \hat{A}]] + [\hat{C}[\hat{A}, \hat{B}]] = 0 \end{aligned}$$

These equations can use to modulate bio quantum path $|z\rangle/|z\rangle$ in some conditions, or even use for music composing since they are actually inversion relationships, just no one writes a piece of music in this way. In an enough gravitational binding Le Châtelier's system, the establishment of musical patterns is naturally happening.

Albeit the modern scientific world lacks inversion modulation and music harmonic is the only exception. It is astonished that ancient people a thousand years ago had already established complete physical inversion training. As in



the figure, just a simple headstand. Since Kungfu is training for CSF-ligaments, use skull and not hand to support the body weight can give CSF a holistic inversion training.

Use hands to do so can only train hand muscles and not CSF inversion. Modern sports

lack these sorts of training since they never train the CSF. This is a kind of rest after

diverse kungfu training. Like the Wudang converging or Shaolin converging, always

combined with this training. However, it can't be used for precluding hypertension or

other senility problems if people can't follow religious forbiddance. Suppose one guy has a lifespan of 80 years, if he trained by the ancient system and followed the religious forbiddance he can live for 90 years; however, if he trained by the ancient systems and can't follow the religious forbiddance, then he can live only for 70 years, even lower than his normal lifespan. (Actually, even for modern people who take sports, too much sexual behavior is still negative to health and lifespan. Just modern sports training for muscles, such a negative effect is not so obvious. However, from (Suppl.Exp.13) we can easily know such a problem. For people who can't reduce sexual behavior to a lower degree, especially after high performance age, the negative effect will gradually emerge.)