



THE SCIENCE OF ENERGY HEALING

TRANSCRIPT

Invisible Biology: An Introduction to Quantum Biophysics | Part 1

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Bruce: Hello, dear friends and cultural creatives. Bruce Lipton here. I'm so honored to be here today to offer an insight and introduction into the nature of energy medicine and a significance of what we might refer to as quantum-biophysics. To introduce this story we have to recognize this—in today's world of allopathic medicine, the concept of energy as relevant to our health is really not considered. There's a fundamental reason why this is true and it really days back to the beginning of conventional science and this was in the days of 1700's especially with the work of Isaac Newton.

Isaac Newton offered a new science to the world, the science of classical physics or Newtonian physics. I say, "What's relevant about this physics?" The significance is that at the time of Newton, the church was running the world and the belief system was that God and spirit and invisible forces were running life as we know it. However, at the same time, Isaac Newton was revisiting an understanding offered by Descartes nearly a hundred years earlier. Descartes was around at the time when clocks were just being invented.

When Descartes looked at the nature of the universe and considered a new relation to a clock, Descartes came up with the idea that the solar system is like a machine, a giant mechanical device. With that idea in his head, Newton started to look at the nature of the mechanisms of how the universe works. It's important for us to understand that there's a synonym with mechanisms and that is physics. Physics equals mechanisms, mechanics. **The science of physics is a science of the mechanisms of how the universe works.**

As Isaac Newton started to understand the nature of the universe he had to create a new math called calculus. The data that he put into his equation, his calculus equation, consisted of physical data: the size of a planet, the mass of a planet, the velocity of a planet, the vector of the planet and the way it moved. He puts this physical data into his equation and solves the equation to the extent that he's able to accurately predict the movements of the universe. **The significance of this is that science is based on prediction.**

Since Newton was able to accurately predict the movements of the universe it really revealed that he had some insight into the nature of the mechanisms which we now call classical physics. The significance of this physics is simply this, that it is based on the concept of a physical universe separate from an energetic universe. Yes, both the realms of nature existed—the physical and energetic realms—but what was in the physical realm was not really affected by what was an energetic realm. Hence, Newtonian physics is a physics based on materialization, the material aspects of the universe.

Through his equation, since he was able to interpret the movements of the universe with his calculus, it also implies that anything in the universe would actually be understood using the same equations. Therefore, conventional science said, "To understand life on this planet we do not need to invoke invisible forces, God, spirit (whatever you would like to call it). You can understand the universe through its mechanical representation." Therefore, if you want to understand the universe just study the material physical parts and you don't have to offer any insight into the energetic part because it's not relevant as demonstrated by Isaac Newton's equations.

Then, when we start with an understanding that science is based on the physicality then we have to understand the simple aspect of that and that is, if everything in the universe is based on Newtonian Physics, it's a mechanism you can understand. What about things that are complex like the human body? I say, "To understand that, it could be capable of being understood by what? Taking it apart like a machine." As you take a machine apart you can study the pieces and when you study the pieces and understand how the pieces work then you can assemble all this knowledge, put it back into a whole and understand how the whole works.

In understanding a human body in Newtonian physics, the first to understanding is that the body is considered as a machine. The second understanding is, outside of the material aspects, to understand a complex machine you need to take it apart. That's called reductionism. By 1953, science had taken living systems apart to the extent that we saw the nature of DNA, nucleic acid, the material of which genes are made. This is the physical foundation of life—an answer that was sought-after when you recognize in a Newtonian world that the physical expression is the only one you need and the physical expression to make life is reduced down to the story of DNA.

The significance of DNA is the belief that DNA is controlling, not just the physical characteristics of our human body, but also our emotions and our behavioral characteristics as well. The significance is we reached the bottom of reductionism. We take the mechanical device called the living system apart, take it down to its fundamental nuts and bolts, get to the bottom and there you have DNA. You offer DNA the concept that DNA controls life. This is a belief called genetic determinism.

As illustrated in this cover of *Life Magazine* ("Were you born that way?"), what this title is really trying to show you is that the genes that you were born with will determine not just your physical characteristics I mentioned but also, as I said, your emotional-behavioral traits as well. What's the significance of buying into this belief? The significance is this: as far as we know we didn't pick the genes we gained and if we don't like the traits that the genes offer, what can you do about it? You'd have to re-engineer your genetics.

Since we can't do that then you look back and say, "Wait a minute, my life is not controlled by me. My life is controlled by my DNA. Something I didn't pick or select and something I can't change and it controls my life." When you understand something like this you understand something very significant. That significant aspect is that, because we didn't pick the genes and we can't control the genes and the genes control our lives, we are led to believe that we are victims—victims of our heredity. The significance about being a victim is that you recognize that you're not powerful in controlling your own life.

We have essentially programmed the public with a belief in genetic determinism—that genes control their lives, they don't control the genes and, therefore, what is really

necessary at this point is for someone else to come in and rescue them. Hence the medical profession comes in at this point. The whole issue comes down to this: is this belief system correct? Do genes really control life? The significance of this is that the genes are essentially are collected in the structure called the nucleus of the cell.

99% of the genes essentially are in the nucleus. The significance of that is if genes control life, then the nucleus represents the equivalent of the cell's brain because within it the DNA programs would be then controlling the action of life—just as much as neurons in a brain would be controlling the unfolding of our biology. We have bought into a belief system that's in all the textbooks that the nucleus is the equivalent of the brain of cell because that's where decisions are made. I said, "Is this really a true statement?"

The first thing you have to understand is this: if you remove the brain from any living organism, there's only one necessary consequence. That consequence is the organism dies. The significance is without the control then the brain offering that control once removed leaves the organism without control and the organism dies. Then, I say, "Let's go to a cell." We have talked about the fact that the nucleus of the cell represents the brain of the cell because that's where the controlling DNA is to be found. You can remove a nucleus from the cell. It's something called enucleation.

In fact, I did enucleation experiments as much as about 40 years ago. What did we find out? If you remove the nucleus from the cell, the cell does not die. The cell lives and its behavior is essentially unaffected. **In other words, a cell without a nucleus is capable of displaying very complex behaviors—interacting with the environment, interacting with other cells and interacting with parasites and viruses as well. In other words, a cell's behavior is not dependent on the presence of the DNA. The fact is very simple, the nucleus is not the brain of the cell.**

Now we're left with a very important fact that I must emphasize and that is this, **genes do not control biology. You've held a belief all your life essentially that genes can turn on and genes can turn off. This is a blatantly false assumption. Genes have no control over themselves.** Scientifically, the concept is genes have no self-actualization, meaning genes don't make decisions and genes don't make reactions. Let's face it, a gene is simply the blueprint—the equivalent of a blueprint in an architect's office. When you understand that then making the statement, "Is your blueprint on or off?" becomes senseless.

You go, "Obviously a blueprint has no on and off." Then I go, "This is the point. A gene is a blueprint. It has no on and off." Genes do not control our biology. Then, we're left with a very interesting conundrum because, if genes don't control our biology (which is really what is described in all the textbooks), then we have to understand another insight into the nature of how life is controlled. This is interesting because this is where my own research comes into play.

Back in 1967 and 1968 I was cloning stem cells. What are stem cells? Stem cells are embryonic cells that are in your body right now. You say, "Why should I have embryonic cells in my body?" The answer is simply this, everyday you lose hundreds of billions of cells in normal attrition. Age, wear-and-tear, et cetera. Hundreds of billions of cells are dying daily. Then you're left with a very simple logical question, "How many days can you live if you're losing hundreds of billions of your cells everyday?" And the answer is, "A very short time."

However, in our body are stem cells—the equivalent of embryonic cells. Significance? As hundreds of billions of cells die everyday, hundreds of billions of new cells are created from our stem cell population everyday. What are stem cells? Embryonic multi-potential cells that are in your body. Back in 1967 and 1968 I began cloning stem cells. What I would do is take one stem cell, put it in a petri dish all by itself. That cell would divide every ten to twelve hours. After a period of about a week I'd have about 50,000 cells in the petri dish. But the most important factor you have to understand is this: the cells are genetically identical because all of them came from the same parent cell. So I have 50,000 genetically identical cells.

Now here's where my experiment actually rocked my life. I took those genetically identical cells and split the population up and inoculated them into three different petri dishes. In each petri dish I provided a culture medium which I created and changed the chemistry of that culture medium a very little bit. The significance is, when I put the genetically identical cells in three petri dishes, I actually provided three different environments—the culture medium being the environment. What happened was this, in environment A, the cells differentiated and formed muscle.

In the second petri dish with environment B the cells differentiated and formed bone. In the third petri dish C, with yet a different environment, the cells formed a fat. All of a sudden you're left with the most profound question looking you right in the face and the question is this, "What controls the fate of the cells?" All of a sudden you realize something very simple. All the cells were genetically identical so the genes did not promote whether it became muscle, bone or fat. It was the environment. And all of a sudden there's a new insight that says, **"Wait, the fate of a cell is directly tied to what's going on in the environment around it." Rather than the genes controlling the cell it's the environment that influences the behavior and the genetic activity of the cells.**

What I saw back in 1968 was the future of science because in 1990 a new science was recognized called epigenetics. This is the science that was describing what I was showing back in 1968. What is this epigenetics? First of all, when we talked about genetics, we talked about genetic determinism. When I say genetic control, what I mean is control by genes. Now, we're talking epigenetics. Epigenetics is different. Profoundly. It is revolutionary.

What's different about it" 'Epi' means above. When I say the words 'epigenetic control', I am literally saying control above the genes. Why is that relevant? Because control is not in the genes, it's above the genes. When you understand that then all of a sudden the concept of genetic determinism falls by the wayside. Why? Because we now recognize it is environment that's influencing genetic read out. When genes controlled your life you were a victim because you had no control over the genes.

In the new science of epigenetics, when you understand the environment controls your life, then you realize you have a mastery over your genes because you're the one that can change your environment or your perception of that environment and therefore change your life. We're not victims. What does the new science show us? In this cartoon image of a cell in a culture dish recognize, if I added new chemistry signals from the environment to the system, as the signals come in to the solution many of the signals get picked up on the membrane of the cell. The membrane of the cell, called the cell membrane, is the equivalent of the skin.

What happens is this: when an environmental signal is picked up by the skin of the cell, the signal is relayed inside the cell to control behavior of the cell—to activate behavior. The same signals can also go into the nucleus of the cell and activate the genes. This is what I saw back 40 years ago and today we understand these activities as parts of new science. **The big new science in the field is called signal transduction.** This is the leading edge of today's science and it says, "Signals from the environment are controlling the fate of the cell." So how is the signal from the environment translated into biology? That's the science of signal transduction.

A branch of signal transduction is when the signals from the environment go in and specifically affect the genetic activity of the cell. That's a new science that's called epigenetics. **Epigenetics is the signal transduction version of how an environmental signal alters our genetic activity.** It turns out the skin of the cell is not just skin, but it's also the brain. The cell's brain is the mem-"Brain" of the cell and it's very interesting because in human biology the skin of the embryo becomes the nervous system of the biological human organism.

Basically, yes, in both a cell and a human the nervous system is derived from the skin. If you want to understand how the cell works then you must take it apart. That's the reductionism part. When I did that I found that a cell is made up of about a 100,000 different protein parts. All of a sudden we get to the bottom. Proteins are the physical basis of life. What's very important about the protein (100,000 or more different versions of these proteins) is that proteins can respond to an environmental signal.

Information from the environment can affect the shape of a protein. What happens is when an environmental signal is experienced by that protein, the signal causes the protein to change shape. This is a conformational change in the protein. What's the relevance? A protein is a physical structure that gives you your body, but in the presence of an environmental signal the protein can actually move. It changes the shape.

What is the movement useful for? The movement is useful for this. As proteins move, the movement that they carry out can be used to do work. All of a sudden you say, "Oh my goodness. Life comes from proteins that are moving." We have 100,000 different protein gears (think of it that way) and as these protein gears interact and as they move they create the functions of life. Respiration, digestion, secretion, nervous function, et cetera.

You say, "How can proteins create something like that?" Here's a very interesting short video clip from the Tesla Car plant in California. What's interesting about this is when you see this image on the screen you see that all these red machines scattered through the factory. These are the equivalent of proteins. They are little machines. They have a structure and they have very precise movements on signals.

What can they do? These proteins, each doing their own little movement, are engaged with one another in an assembly line factory and what you can see is that these little protein-like machines are actually building a car. Why is that relevant? At a nano level, proteins are the equivalent of these red machines and at the nano level, when they assemble they create metabolism.

I can create molecules, I can digest molecules. The protein machines become the mechanisms that manifest life because that's where life comes from. It's very fundamental to show it to you. Here's a video taken of proteins moving and this is a

special protein called kinesin—it looks like two pipe cleaners twisted together with two little globular protein foot-like structures. Below the picture at the bottom is a structure called the microtubial that's like a protein railroad track. Watch what happens. When the kinesin molecule touches the protein, it causes the protein to change shape.

When the protein changes shape it moves. So when one of these globular protein touches the microtubial and then changes shape it causes the other globular protein to change its shape and move like a foot forward. Every time one of these globular proteins of kinesin changes shape it causes a shape change in the molecule and the molecule is essentially walking along the microtubial. You say, "Okay, that's pretty interesting in structure, but what does it look like in real life?" It looks like this.

Here is a kinesin molecule carrying a vesicle down the microtubial like a railroad track and moving it down the cell and all of this is a result of a protein conformational change. Now, we're left with a very simple understanding of life and it's based on this: **proteins are the building blocks of which your body is made, but proteins can respond to signals. When a signal is complimentary to a protein and it binds with the protein it causes the protein to change shape and that creates behavior. This is the fundamental equation of life.** You are a protein body and your body's proteins are responding the signals. When they hear or respond to that signal they change their shape.

The movement that result is then used to do the work such as respiration, digestion, muscle contraction, neural function. All of these are due to proteins responding to signals and creating behaviors. That's really the secret of life. But now the question is, "What kind of signals drive the proteins?" This is an interesting article from a guy called Dr. Tsong. Dr. Tsong is a scientist who was deciphering the language of the cells (as the article is entitled). What was he doing? He was working with electromagnetic fields and asked, **"Can electromagnetic vibrations be a signal that can control protein function? Of course he found out, "Yes." In fact, very specific vibrational frequencies can activate different functions in cells.**

Why I'm showing you this is not about the article of energy affecting the movement of the proteins, but I wanted to show you a quote which is right in the introduction of this paper. I'll read it to you and the quote is, "A prominent biochemist, in a recent conversation with this author [that's Tsong], even labeled the study of this type of cell-to-cell communication as 'astrology' and maintained that signals could only be carried by 'the substance of chemistry.'" You say, "Yeah, but what does that mean?"

That is a Newtonian Classical Physics based understanding of life. Life is a physical machine and therefore in this world of scientific materialism it requires a scientifically material, physical device to alter that machine. Remember, in classical physics the energy realm and the physical realm are separated. So the fact that Tsong shows electromagnetic vibrations can activate the protein movement was not really relevant to this biochemist having been trained in classical physics that says, "Ignore the invisible stuff and focus on the chemistry."

That's why he said, "Signals can only be carried by the substance of chemistry." **What's the relevance of that? The answer is simply this: if a patient comes in and they need a doctor's help then the doctor is going to provide them signals which are called drugs which are chemistry. It's a consequence of a science based on**

materialism. In this illustration, the schematic of an idea of how a signal can fit into a protein in our mechanical physical interpretation of the world. The signal is like a key that plugs in to the protein and activates the protein's function to change shape.

In our conventional world, the signals come from the environment. But by our conventional understanding, the signals are chemistry which then means, **if you're going to be in the healing arts of our conventional allopathic world, then you're going to use chemistry as a signal to help people change their behavior and that chemistry is referred to as drugs. That's why the allopathic community, the drug industry community, relies on chemistry to control life. But the question is, "Is the mechanical material signal the only signal that affects proteins?"**

In a world of Newtonian mechanics the part of the universe that we need to understand is made up of matter and if you want to understand how matter works, we take it apart—reductionism. And then we understand the mechanical devices and now we put a picture in that chemistry plus proteins causes life to occur. This is really good, except in 1925 a new concept of physics came in called Quantum Mechanics. It changes the entire thing. It's a revolution.

We've been focusing on a material-mechanical universe in a Newtonian world and in a quantum mechanical world it's all based on energy. In fact, everything made out of matter is actually made out of energy. When we get into the realm of quantum mechanics we have to recognize something very important. **Newtonian mechanisms are still present in the world of quantum mechanics.** That doesn't mean because quantum physics came in Newtonian mechanisms are out, no. Newton's equations still work today as they did in the 1700's. **What you have to understand is this, quantum physics is a very big science. Newtonian physics is a small science.**

Therefore, if you really want to understand the universe and how it works...if you focus on the Newtonian mechanism you're leaving out a bigger picture of the universe. Now we have to understand, "What is energy?" It's invisible but it has a force aspect so it can move things. Can I see what energy would look like? I know it's invisible, but does it have a shape? Sure. Drop a rock into a pond and, as the falling rock hits the water, the kinetic energy of that rock is translated into the water and the force of that energy shapes the water into ripples that radiate out.

Yes. What you saw is water being forced into the shape of waves by the energy. What you're seeing is a reflection of energy shape in the formation of the water. Energy is like waves that move through space, invisible waves. When we talk about energy we have to recognize this. There are two ways of looking at energy. One way is looking at it as a force: energy making things happen. Energy pushing the car down the street—drive force, energy force. What's interesting is that there's another way of looking at energy and that is as information.

There's a cellphone communication in this room right now. It's not going to drive your car anywhere, but it carries information so it's energy. **Relevance is this: allopathic medicine (the conventional scientific medicine of the world in which we live today) only looks at energy as force. Therefore it only looks at energy that changes the physical body.** For example, we refer to it as ionizing energy. Allopathic medicine looks at things like UV light. It looks at cosmic rays. It looks at x-rays.

Why should it look at those forms of energy? Because those forms of energy have force that can actually change the physical body. Energy is crossing over into the physical realm and therefore that kind of energy is in the domain of allopathic medicine. The question is, "What about energy as information?" That's not the way energy is perceived in the allopathic world. They just look at it as a force field. **But information is valuable because information represents signals. And so holistic, complimentary and integrative medicine recognizes this—energy is used and the concept of it is used not as a form of force but as a form of information organizing factors that regulate control of life.**

This becomes very important because in energy medicine, outside of allopathic medicine, there must be a way that energy can influence biology, otherwise there's no mechanism and there's no meaning to it. First thing we must understand is simply this: in Newtonian world we picture an atom like this [see slide]. This Newtonian atom looks like marbles and ball bearings and a little tiny solar system. It's a physical representation of an atom. It's a model. Because we live in a physical, mechanical world we look at this model and go, "Yeah, I can see how these physical particles being physical can be assembled like building blocks put them together and create stuff..." That's a physical expression of life. But is an atom physical?

This is where quantum physics came in for a simple reason. At first, up until 1895, they thought the atom was the smallest particle in the universe. But in 1895 they started to find things were inside the atom. They found things such as electrons that were associated with atoms and then subsequently found out there was a solid structure in the center called the nucleus. And all of a sudden they say, "The atom is not the smallest particle. There are smaller physical particles inside—electrons and neutrons and protons."

That's when everything began to break down because then when the physicist started to say, "What are those subatomic particles made out of?" Then they started to realize they weren't physical at all. The subatomic particles were actually like nano tornadoes—little miniature force fields that are very powerful—just like a tornado is powerful, but a nano size. So what does the atom look like in today's world of quantum physics? The atom looks like this. [See blank slide] There's nothing wrong with the picture. The simple reason is this: there's no physicality to an atom.

You say, "Yeah, but how do you mean 'no physical characteristics'? Look, I can see you. I can see you, you must be physical because invisible energy, we said, was not visible and that's what made it energy. I can see you, you must be physical." I go, "Is that really true? Can you see me in the dark?" Yeah, sounds like a foolish joke. "No, I can't see you in the dark." **Here's the important point. When you see me in the light, you're not seeing me. You're seeing photons of light bouncing off my energy field and being reflected back to you. You're not really seeing the energy that I am. You're seeing a reflection of light.**

If there are no photons of light, you can't see me and then you go, "That's foolish without the light." I go, "Yeah, but you don't understand. What you're really seeing is not the body of energy. You're seeing the reflection of energy photons bouncing off the surface and coming back to your eyes...so you're seeing a reflection of light." Then, you might also say, "Wait a minute, even in the dark I can come up...I can feel you, I can touch you. I can physically see that you're there that way." I go, "This is not necessarily true. Let me show you a picture here of a tornado." Why is this relevant?

I say, "Listen, take your car, drive across this open field and toward that star at 100 miles an hour." And the quick question is simply this, as you drive across the field and you hit the base of the tornado, is your car going to go through the tornado? Yes or no. Absolutely not. When you hit the tornado it will be exactly the same as hitting a stone wall. You'd be crushed by it. You say, "Wait, that tornado you showed me is not energy. I can see it there. I can see the physical stuff." I go, "Wait, wait. Let's take another back track. Let's remove the dirt and dust from the image and now look at the same image."

There's a tornado in the field but you can't see it. Why? Because it's a force field. Then I say, "Okay, drive across this open field 100 miles and hour toward that star on the horizon right there." As you're driving across this open field, boom! you hit nothing. That thing would destroy your car. The relevance about this is what? You hit something. It wasn't matter as you know it, it's a force field. What's a force? It pushes things. Your car is going this way, the tornado is going this way. Which has a stronger force? The tornado has a stronger force point.

Your force cannot penetrate in to the tornado. The tornado will push on you. Relevance? Then you could feel the tornado. You can put your hands on it, you can feel where the energy is. All of a sudden you say, "It's physical." I go, "No, energy is a force. It can push back. It feels physical. It's not physical. It's not even visible unless you have a light to reflect on it." **Get a new understanding of atoms. Atoms are simply focused energies. They are like a group of nano tornadoes hanging out together and their force fields are so powerful that it's not easy to push your force through that force. That's why you can feel matter.**