

The Wisdom of Your Cells

Part 1

by Bruce Lipton

The Wisdom of Your Cells is a new biology that will profoundly change civilization and the world we live in. This new biology takes us from the belief that we are victims of our genes, that we are biochemical machines, that life is out of our control, into another reality, a reality where our thoughts, beliefs and mind control our genes, our behavior and the life we experience. This biology is based on current, modern science with some new perceptions added.

The new science takes us from victim to creator; we are very powerful in creating and unfolding the lives that we lead. This is actually knowledge of self and if we understand the old axiom, "Knowledge is power," then what we are really beginning to understand is the knowledge of self-power. This is what I think we will get from understanding the new biology.

Flying Into Inner Space

My first introduction to biology was in second grade. The teacher brought in a microscope to show us cells and I remember how exciting it was. At the university I graduated from conventional microscopes into electron microscopy and had a further opportunity to look into the lives of cells. The lessons I learned profoundly changed my life and gave me insights about the world we live in that I would like to share with you.

Using electron microscopy, not only did I see the cells from the outside but I was able to go through the cell's anatomy and understand the nature of its organization, its structures and its functions. As much as people talk about flying into outer space, I was flying into inner space and seeing new vistas, starting to have greater appreciation of the nature of life, the nature of cells and our involvement with our own cells.

At this time I also started training in cell culturing. In about 1968 I started cloning stem cells, doing my first cloning experiments under the guidance of Dr. Irv Konigsberg, a brilliant scientist who created the first stem cell cultures. The stem cells I was working with were called myoblasts. Myo means muscle; blast means progenitor. When I put my cells in the culture dishes with the conditions that support muscle growth, the muscle cells evolved and I would end up with giant contractile muscles. However, if I changed the environmental situation, the fate of the cells would be altered. I would start off with my same muscle precursors but in an altered environment they would actually start to form bone cells. If I further altered the conditions, those cells became adipose or fat cells. The results of these experiments

were very exciting because while every one of the cells was genetically identical, the fate of the cells was controlled by the environment in which I placed them.

While I was doing these experiments I also started teaching students at the University of Wisconsin School of Medicine the conventional understanding that genes controlled the fate of cells. Yet in my experiments it was clearly revealed that the fate of cells was more or less controlled by the environment. My colleagues, of course, were upset with my work. Everyone was then on the bandwagon for the human genome project and in support of the “genes-control-life” story. When my work revealed how the environment would alter the cells, they talked about it as an exception to the rule.

You Are a Community of 50 Trillion Living Cells

Now I have a completely new understanding of life and that has led to a new way to teach people about cells. When you look at yourself you see an individual person. But if you understand the nature of who you are, you realize that you are actually a community of about 50 trillion living cells. Each cell is a living individual, a sentient being that has its own life and functions but interacts with other cells in the nature of a community. If I could reduce you to the size of a cell and drop you inside your own body, you would see a very busy metropolis of trillions of individuals living within one skin. This becomes relevant when we understand that health is when there is harmony in the community and dis-ease is when there is a disharmony that tends to fracture the community relationships. So, number one, we are a community.

Fact number two: There is not one function in the human body that is not already present in every single cell. For example, you have various systems: digestive, respiratory, excretory, musculoskeletal, endocrine, reproductive, a nervous system and an immune system but every one of those functions exists in every one of your cells. In fact we are made in the image of a cell. This is very helpful for biologists because we can do research on cells and then apply that information to understanding the nature of the human body.

I was teaching what is called the medical model, the perception that human biology represents a biological machine comprised of biochemicals and controlled by genes. Therefore when a patient comes in to see a doctor, the belief system is that the patient has something wrong with their biochemistry or genes, which can be adjusted and can lead them to health. At some point I realized that I had to leave the university because I found great conflict in teaching the students about what controls the cell and yet getting a completely different understanding from the cells in my cultures.

A New Understanding of Science

When I was outside the university I had a chance to read into physics. Again I found information that did not conform to the science I had been teaching. In the world of new physics, quantum physics, the mechanisms that are described completely collide with the mechanisms we were teaching, which were based on the old Newtonian physics. The new physics currently is still not introduced in medical schools. Before conventional science, science was the province of the church. It was called natural theology and was infused with the spiritual domain, teaching that God's hand was directly involved in the unfoldment and maintenance of the world, that God's image was expressed through the nature we live in. Natural theology had a mission statement: to understand the nature of the environment so we could learn to live in harmony with it. Basically this meant learning how to live in harmony with God, considering that nature and God were so well connected.

However, through the abuses of the church, their insistence on absolute knowledge and their efforts of suppressing new knowledge, there was what is called the Reformation. The Reformation, precipitated by Martin Luther, was a challenge to the church's authority. After the Reformation, when there was an opportunity to question beliefs about the universe, science became what was called modern science. Isaac Newton, the physicist whose primary studies were on the nature of gravity and the movement of the planets, provided the foundation for modern science. He invented a new mathematics called differential calculus in order to create an equation to predict the movements of the solar system. Science identified truths as things that were predictable. Newtonian physics perceives the universe as a machine made out of matter; it says that if you can understand the nature of the matter that comprises the machine, then you will understand nature itself. Therefore the mission of science was to control and dominate nature, which was completely different than the former mission of science under natural theology, which was to live in harmony with nature.

The issue of control in regard to biology becomes a very important point. What is it that controls the traits that we express? According to Newtonian physics life forms represent machines made out of matter and if you want to understand those machines you take them apart, a process called reductionism. You study the individual pieces and see how they work and when you put all the pieces together again, you have an understanding of the whole. Charles Darwin said that the traits an individual expresses are connected to the parents. The sperm and egg that come together and result in the formation of a new individual must be carrying something that controls the traits in the offspring. Studies of dividing cells began in the early 1900s and they saw string-like structures that were present in cells that were beginning to divide. These string-like structures were called chromosomes.

Interestingly enough, while chromosomes were identified around 1900, it was only in 1944 that we actually identified which of their components carried the genetic traits. The world got very excited. They said, oh, my goodness, after all these years we

finally have gotten down to identifying the genetically controlling material; it appears to be the DNA. In 1953 the work of James Watson and Francis Crick revealed that each strand of DNA contained a sequence of genes. The genes are the blueprints for each of the over 100,000 different kinds of proteins that are the building blocks for making a human body. A headline announcing Watson and Crick's discovery appeared in a New York paper: "Secret of Life Discovered" and from that point on biology has been wrapped up in the genes. Scientists saw that by understanding the genetic code we could change the characters of organisms and therefore there was a big, headlong rush into the human genome project to try to understand the nature of the genes. At first they thought these genes only controlled the physical form, but the more they started to manipulate genes, they saw that there were also influences on behavior and emotion. Suddenly, the genes took on more profound meaning because all the characters and traits of a human were apparently controlled by these genes.

Are We Victims of Heredity?

Yet there was one last question: what is it that controls the DNA? That would be going up the last rung of the ladder to find out what is ultimately in control. They did an experiment and it revealed that DNA was responsible for copying itself! DNA controls the protein and the protein represents our bodies. Basically it says that life is controlled by DNA. That is the Central Dogma. It supports a concept called "the primacy of DNA" that says who and what we are and the fate of the lives we lead are already preprogrammed in the DNA that we received at conception. What is the consequence of this? That the character and fate of your life reflects the heredity you were born into; you are actually a victim of heredity.

For example, scientists looked at a group of people, scored them on the basis of happiness and tried to find out whether there was a gene that was associated with happy people that was not active in unhappy people. Sure enough, they found a particular gene that seems to be more active in happy people. Then they immediately put out a big media blip on "gene for happiness discovered." You could say, "Well, wait a minute. If I got a sucky happy gene, then my whole life is going to be predetermined. I'm a victim of my heredity." This is exactly what we teach in school and this is what I had also been teaching-that people are powerless over their own lives because they can't change their genes. But when people recognize the nature of being powerless, they also start to become irresponsible. "Well, look, Boss, you're calling me lazy but I just want you to know my father was lazy. What can you expect from me? I mean, my genes made me lazy. I can't do anything about it." Recently in Newsweek they wrote about how fat cells are waging war on our health. It's interesting because in an epidemic of obesity science stands back and says: it's your fat cells that are waging war in your life.

The Human Genome Project

To come and save us, the human genome project entered our world. The idea of the project was to identify all the genes that make up a human. It would offer the future opportunity of genetic engineering to correct the ills and problems that face humans in this world. I thought the project was a humanitarian effort but it was interesting later to find out from Paul Silverman, one of the principal architects of the human genome project, what it was actually about. It was simply this: It was estimated that there were going to be over 100,000 genes in the human genome because there are over 100,000 different proteins in our bodies; plus there were also genes that didn't make proteins but controlled the other genes. The project was actually designed by venture capitalists; they figured that since there were over 100,000 genes, by identifying these genes and then patenting the gene sequences, they could sell the gene patents to the drug industry and the drug industry would use the genes in creating health products. In fact, the program was not actually for advancing the human state as much as it was for making a lot of money.

Here is the fun part. Scientists knew that as you go up the evolutionary scale, simple organisms have less DNA and when you get to the level of humans, with the complexity of our physiology and our behavior, we have a lot more DNA. They thought that primitive organisms would have maybe a few thousand genes but humans were going to have approximately 150,000 genes, which meant 150,000 new drugs. The project began in 1987 and just showed again that when humans really put their heads together they can create miracles. In only about fourteen years we actually had the results of the human genome. It also was what I call a cosmic joke.

To begin the human genome project they first studied a primitive organism, a miniature worm that is barely visible with your eye. These worms had been an experimental animal for geneticists because they reproduce very quickly and in very large numbers and thereby express traits that you can study. They found that this small animal had a genome of about 24,000 genes. Then they decided to do one more genetic model before doing the human and that was with the fruit fly because of the large amount of information already available on the genetics and behavior of fruit flies. The fruit fly genome turned out to have only about 18,000 genes. The primitive worm had 24,000 genes and this flying machine had only 18,000 genes! They didn't understand what that meant but put it on the back burner and started the work on the human genome project.

The results came in 2001 and were a major shock: in the human genome there are only about 25,000 genes; they expected nearly 150,000 genes and there were only about 25,000! It was such a shock that people actually didn't talk about it. While there was a lot of hoopla about completing the human genome project, no one talked about the 100,000 missing genes. There was complete lack of discussion in the

scientific journals about it. When they realized there were not enough genes to account for human complexity, it shook the foundation of biology

Why is it so important? If a science is based on the way life really works, that science would be good for use in medical practice. But if you base your science on wrong information, then that science could be detrimental to medical practice. It is now a recognized fact that conventional allopathic medicine, the primary medicine we use in Western civilization, is a leading cause of death in the United States. It is also responsible for one out of five deaths in Australia. In the Journal of the American Medical Association Dr. Barbara Starfield wrote an article revealing that from conservative estimates, the practice of medicine is the third leading cause of death in the United States. However, there is a more recent study by Gary Null (see Death by Medicine at: www.garynull.com). He found that rather than being the third leading cause of death, it is the first leading cause with over three-quarters of a million people dying from medical treatment each year. If medicine actually knew what it was doing, it wouldn't be that lethal.

I left the university in 1980, seven years before the human genome project was started because I already was aware that genes didn't control life. I was aware that the environment was influential but my colleagues looked at me as not just being a radical but a heretic because I was conflicting with the dogma; therefore this became a religious argument. At some point the religiosity of where I was led me to resign my position. That's when I started to advance into understanding about brain function and neuroscience. What I was really trying to find out is if it's not the DNA that controls cells, then where is the "brain" of the cell?

The Computer Within

The new biology revealed that the brain of the cell is its skin, the mem-brane, the interface of the interior of the cell and the ever-changing world we live in. It is the functional element that controls life. This is important because understanding its function reveals that we are not victims of our genes. Through the action of the cell membrane we can actually control our genes, our biology and our life and we have been doing it all along although we have been laboring under the belief that we are victims.

I started to realize that the cell was a chip and that the nucleus was a hard disk with programs. The genes were programs. As I was typing this on my computer one day I realized that my computer was like a cell. It had programs built into it but what was expressed by the computer was not determined by the programs. It was determined by the information that I, as the environment, was typing onto the keyboard. Suddenly all the pieces fell into place: the cell membrane is actually an information-processing computer chip. The cell's genes are the hard drive with all the potentials. That is why every cell in your body can form any kind of cell because every nucleus

has all the genes that make up a human. But why should one cell be skin and another cell be bone or eye?

The answer is not because of the gene programs but because of the feedback of information from the environment. All of a sudden the bigger thing hit me: what makes us different from each other is the presence of a set of unique identifying protein keys (receptors) comprising the keyboard on the surface of our cells. The identity keys on the cell membrane respond to environmental information. The biggest “Aha!” was this: that our identity is actually an environmental signal that is playing through the keyboard on the surface of our cells and engaging our genetic programs; you are not inside your cell, you are playing through your cell using the keyboard as an interface. You are an identity derived from the environment.

In my younger days, I didn’t see that religion was offering me truth. I went away from spirit and ended up in science. Realizing that my identity was something from the environment playing through my cells was the greatest shock to my world because I was completely thrown from a non-spiritual reality into the requirement of a spiritual existence. My cells were like little television sets with antennas and I was the broadcast that controlled the readout of the genes. I was actually programming my cells.

I realized that if the cell died, it did not necessarily mean the loss of the broadcast—that the broadcast is out there whether the cell is here or not. All of a sudden it hit me with such profound awe. What I realized was that survival was not that important because of my eternal character was derived from some broadcast in the field. The fear of mortality disappeared. That was about twenty-five years ago and it was one of the most wonderful, liberating experiences I ever had.

Perception: The Power of the New Biology

We perceive the environment and adjust our biology, but not all of our perceptions are accurate. If we are laboring under misperceptions, then those misperceptions provide for a mis-adjustment of our biology. When our perceptions are inaccurate we can actually destroy our biology. When we understand that genes are just respondents to the environment from the perceptions handled by the cell membrane, then we can realize that if life isn’t going well, what we have to do is not change our genes but change our perceptions. That is much easier to do than physically altering the body. In fact, this is the power of the new biology: we can control our lives by controlling our perceptions.

We are holding “truths” about science that are actually untruth, they are actually “assumptions,” and false assumptions at that. Until we correct them, we are misunderstanding our relationship to the planet, to nature and the environment. As a result we are destroying that which has provided us life, the environment.

False assumption number one is that the universe is made of matter and its understanding can be attained by studying matter. Our perception of a material-only biology and environment is no longer scientifically accurate. Another assumption is that genes control life. It is actually our perceptions that control life and by changing our perceptions we can get control over our lives. I will discuss more about this later. Assumption number three is a very dangerous assumption: that we arrived at this point in our evolution using the mechanisms of Darwinian theory, which may be summed up as “the survival of the fittest in the struggle for existence.” It turns out in the new biology that evolution is based on cooperation. Until we understand that, we keep competing with each other, struggling and destroying the planet without recognizing that our survival is in cooperation and that our continued competition is the death knell of human civilization.

The Future of Medicine

Everything in the universe is now understood to be made out of energy; to our perception it appears physical and solid, yet in reality it is all energy and energies interact. When you interact in your environment you are both absorbing and sending energy at the same time. You are probably more familiar with terms such as “good vibes” and “bad vibes.” Those are the waves at which we are all vibrating. We are all energy. The energy in your body is reflecting the energy around you because the atoms in your body are not only giving off energy, they are absorbing energy. Every living organism communicates with these vibrations. Animals communicate with plants; they communicate with other animals. Shamans talk to plants with vibrations. If you are sensitive to the differences between “good” and “bad” vibrations, you would always be leading yourself to places that would encourage your survival, your growth, your love, et cetera, and staying away from situations and places that would take advantage of you or cancel who you are.

When we are not paying attention to our vibrational energies, we are missing the most important readouts from our environment. Understanding of the new physics says that all energies are entangled and interact with each other. Therefore, you must pay attention to these invisible forces that are involved with what’s going on in your life. While medicine does not train its doctors to recognize that energy is part of the system, they very easily adapted to using the new scan systems to determine what is going on inside the body. It is humorous that they read their scans as “maps,” but do not have the fundamental understanding that their maps are direct readouts of the energy present in the body.

For example, in a mammogram revealing a cancer, one is you are visualizing a characteristic emission of energy distinctive of a cancer. Rather than cutting out the cancer, what if you applied an energy that, through interference patterns, would change the energy of those cancer cells and bring them back to a normal energy? Presumably you would get a healing effect. This would make sense out of thousands of years of what is called “hands-on healing.” The recipient is getting an energy that

is interacting with their body through interference and through that interference, changing the character of the energy reflected in the physical matter because the matter is the energy. This is the future of medicine although we are not there with it right now.

Quantum physicists reveal that underneath apparent physical structure there is nothing more than energy, that we are energy beings. That means that we interact with everything in the field. This has an important impact on health care. Quantum physics reveals that energies are always entangled with each other. In an energy universe, waves are always flowing through and interacting with all other waves. We can never separate someone fully from the environment they live in. Quantum physics says the invisible energy is one hundred times more efficient in conveying information than are material signals (e.g., drugs). What we are beginning to recognize is that there is an invisible world that we have not dealt with in regard to understanding the nature of our health.

In other words, rather than focusing on matter, in a quantum world we focus on energy. In the mechanical world we said we can understand everything by reductionism. But in the newer quantum understanding of the universe we have to understand holism: you cannot separate one energy vibration from another energy vibration. We have to recognize that in the world we live in we are entangled in an unfathomable number of energy vibrations and we are connected to all of them!

Here is my definition of the environment: it is everything from the core of your being to the edge of the universe. It includes everything in close proximity to you as well as the planets and the sun and what is going on in the entire solar system. We are part of this entire field. To summarize the significance of this let me give you a quote from Albert Einstein: "The field is the sole governing agency of the particle." What he says is this: the field, the invisible energy, is the sole governing agency of the physical reality

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The Wisdom of Your Cells

Part 2

by Bruce Lipton

How Your Beliefs Control Your Biology

Conventional physics sees the human body as a machine made of atoms and molecules but the quantum physicists reveal that underneath that apparent physical structure there is nothing other than energy. That means we are energy beings interacting with everything in the entire energy field. What we are beginning to recognize is that there is an invisible world that we have not dealt with in regard to understanding the nature of our health. In other words, rather than focusing on matter, in a quantum world we focus on energy. In the world we live in we are entangled in an unfathomable number of energy vibrations and we are connected to all of them! In trying to understand a person's health, if you only focus on the physical, you miss the energy. If you only focus on the person, you miss the influence of the field. We are coming into a more holistic way of studying the fact that everything is one whole.

In quantum physics we also encounter a world of uncertainty. We have to let go of our Newtonian belief that we can determine everything, control everything and dominate nature, and come back to the natural theology approach that said to learn the patterns as best we can and live in harmony. By doing so we would be far better off today than in the world we have created, where our deterministic pursuit has changed the environment, changed ourselves and actually threatens our own demise. There is a comeuppance here and it comes down to understanding the nature of the field, meaning everything from the core of our being to the edge of the universe. We are part of this entire field.

Our thoughts are part of the energy field as is the energy from other living organisms and from non-living things. *Everything* is giving off energy. As we are doing neurological processing of the world that we live in, including our thoughts and beliefs, we are actually creating a magnetic vibration, like a tuning fork that emanates from our head out into the field. Scientists have found that if they take our magnetic field and direct it back into the head they can influence brain activity.

Why this becomes relevant in our lives and in quantum mechanics is that we go back to the quote by Einstein: "The field is the sole governing agency of the particle." If we apply this understanding of Einstein's to the field that we generate with our thoughts, we can see that there is a connection wherein our thoughts can give shape to the particles that are the world we live in. All of a sudden we see that we are not disconnected little pieces moving around on the planet. We are little broadcast

devices, giving the field shape and the shape that we generate manifests as the life experiences that we have.

It has been well known for a long time that in “crowd effects” or “mass event effects” where you get enough people together with their thoughts coherent, major events can occur on the planet. We are very much involved with shaping the world we are in. While mass events shape mass reality, we also participate in shaping our local reality and experiences through our own thoughts. This becomes important because if thoughts are giving rise to the material world, which according to physics they would be doing, then we have to start thinking about what kind of thoughts we are generating. Physicists have now come to owning that we all collectively create the world we live in through our observations: the world that we observe is the world that we create. This is very hard for most people to accept.

In fact, when quantum physics was first becoming accepted as the mechanisms by which the universe operates, the physicists had trouble with this themselves. They could say, “Well, I can see these ideas working at the level of atoms and molecules but I can’t bring that kind of weirdness into my life.” So there was an arbitrary decision back in the 1920s to say, “Let’s restrict quantum mechanics to the world of atoms and molecules and use Newtonian physics to describe the rest of the world.” That is why biology went on its merry way using Newtonian physics. Yet we are today beginning to see work by very reputable scientists that says the universe is created by our observations; we create the field and the field shapes the particle. The big lesson is that what you think or ask for, as the Asians would say, is what you are going to get. It is not a coincidence; we are actively involved in physically shaping the world that we experience.

How It Works: the Biology

To understand how it works, we are going to talk about the biology. We start with the fact that we are made of cells and cells are living organisms made from protein building blocks. There are over 100,000 different kinds of proteins, which are molecules with very complex shapes almost like gears that engage with each other. Some of these coupled-protein gears create respiration, some provide for digestion, others for muscle contraction, et cetera. All the functions of the cells are due to protein gears. The blueprints for the gears are the genes. When I need to make gears for myself I have to go get the blueprint from the DNA, copy the blueprint, which is called RNA, and then use that RNA to build the proteins.

The assemblies of protein gears in biology are called pathways, such as a digestive pathway or a respiratory pathway. I can look at all the physiologic characters of the human body and identify them as gears that are engaging with each other and through that interaction providing the movements that are the character of life. At this point we should have a big drum roll because I am going to try to tell you the *secret of life*. The secret of life is movement. Without movement there is no life; animation is

a character that distinguishes living things from non-living things. So the issue is, what is this movement and how does it come about?

All proteins are like strings of pop-it beads; the beads are amino acids. There are twenty different kinds of amino acids, and each of these amino acid “beads” has a unique shape. Changing the sequence of amino acids in the chain, changes the final shape of the protein. Here’s the secret: the sequence of amino acids are like built-in knitting instructions that tell the string how to fold up to form a specific structure. It’s like self-knitting yarn. When amino acids are assembled into a chain you get a piece of protein “yarn” and then this piece of yarn will automatically knit itself into a specific structure based on the sequence of amino acids. We have 100,000 different proteins and each protein has a unique length and a unique sequence of amino acids that will determine how to knit that piece of yarn into a shape.

The body of a person who just died has all the physical characters and attributes of a live person, but it is not moving. Therefore the secret of life is not the proteins alone. The proteins provide for the structure but what causes the structure to move? Along the length of the protein chain, many of the linked amino acids have positive or negative charges where other kinds of chemical signals can bind. The final shape of the protein will provide uniquely shaped binding sites that complement specific environmental signals (such as hormones, drugs and other biochemical factors). When a protein binds its complementary signal, it changes the balance of the positive and negative charges along the protein “yarn.” This causes the protein string to “adjust” its shape. In the process of changing shape, the protein moves. The movement is then used to do “cellular” work. Functions such as digestion and respiration are a result of proteins changing shape.

Life is a result of proteins being engaged by signals in a lock and key fashion. Newtonian-based conventional biology considers that all the signals that control biology must be chemical. As a result, the pharmaceutical industry was created to make new, life-controlling signals called drugs. Conventional medicine believes that if your biology is not working appropriately, your gears are not engaging correctly. Therefore, if we change the signals in your system we can change the regulation and functioning of the protein gears and take you from a diseased state into a state of health by changing your chemistry. But quantum mechanics questions whether the “signal” has to be a physical chemical. In fact, invisible energy signals are a hundred times more efficient in signaling proteins than are actual chemical signals. To summarize, proteins provide the function-creating gears; protein movement, driven by the binding of signals, provides for life; and the signals can be of two kinds: chemical signals or the more efficient energy signals.

The energy signals are the medium that unites most complementary medicine modalities. Asian medicine, for example, with its meridians and acupuncture points, is based on dealing with energy fields. Western medicine tries to manipulate the

body's physical components while Eastern medicine tries to change the body's energy fields. It is important to note that quantum physics, which describes the mechanics of the universe, emphasizes that energy signals are a hundred times more efficient than drugs.

What Can Go Wrong?

If you are expressing a dysfunction or a disease, to what can you attribute it? It is probably due either to the proteins not having the right structure, or the presence of inappropriate signals. How can the protein structure be off? Defective genes alter a protein's amino acid sequence, causing proteins to be assembled incorrectly and as a result not function appropriately, thus leading to disease. But here's the catch. Only a very small percentage of people actually have genetic defects that can cause a disease, far less than five percent of the population. That means ninety-five percent of us arrived on this planet with genes that were capable of providing us with a healthy existence. For ninety-five percent of the population, if they are failing in health it is not something wrong with the genes and the proteins, it is something wrong with the body's *signals*. Inappropriate signals are the source of most human illnesses and dysfunctions.

What could cause the signals to be off? The first cause is trauma, damage from an accident that interferes with the conduction of signals from the brain. The second is from toxins, chemicals that shouldn't be in the body but when present interfere with the body's signaling chemistry. And the third, most important and predominant source of incorrect signaling is the mind. If the mind sends the wrong information at inappropriate times, our systems become imbalanced, leading to dysfunctions and diseases. Therefore rather than focusing on the genes and the body's chemistry, which is the myopic focus of conventional allopathic medicine, the new physics and the new biology reveal that we should be focusing on both the physical signals and the energetic signals, which include thought.

The surface of our cells may have over a hundred thousand protein receptors waiting for their complementary signals to show up. The cell reads both the physical and non-physical elements of the environment through these proteins. Signals generally provoke a response that causes the cell to maintain its survival. "Food is out there; take it in. Toxins are out there; escape and avoid them." The skin of the cell and the skin of the human body carry out the exact same functions. They're "read and respond to" signals.

The Role of Perception

On the surface of the cell at any one time there are over a hundred thousand different switches prepared to respond to a massive variety of environmental signals. While we can describe the nature of one signal engaging one response, we have to incorporate the complexity of wholeness when thousands of signals are acted upon at the same time. If we really want to know what the cell is doing we can't look at any

one switch; we have to identify what a hundred thousand switches are doing. The numbers of interactions go beyond our ability to grasp with our minds and would be a very difficult project even for computer engineering.

These protein switches control the functions of our lives through *awareness of the environment*. That is precisely the definition for the word *perception*: an awareness of the elements of the environment through a physical sensation. These membrane switches are fundamental units of perception; they read an environmental perception and adjust the biology to the need required. This becomes very personal because it is the way we perceive the world that controls our behavior. *Perception controls behavior*

If our perceptions are accurate then the opportunity of survival is very great. But if we are programmed with misperceptions and read the environment inaccurately, then that means we will inappropriately engage our responses. Consider an anorexic person looking in a mirror. While we may see that person as dangerously thin, the anorexic perceives himself or herself as very large and fat. That misperception signals their biology to get rid of more fat and that misreading of environmental cues can lead to their death. The significance is very clear: when our perceptions are inaccurate, our behaviors are no longer synchronized to support our survival.

Perception also controls the read-out of the genes. It is how we see life that determines which genes will be activated to provide for our survival. Again, emphasizing the role of misperception, if we inappropriately activate genes because we sent the wrong signal at an inappropriate time, then we can subvert the function of the biology and actually cause disease and dysfunction. We are not so much the victims of genes as we are the creator of our lives, selecting genes to control our systems, based upon our perception of reality.

It is true that we have a period of development from conception to the fetal stage wherein the body plan is being laid down and the structure is being coordinated by the genes. Information feedback between the embryo, its environment and the genes controls this developmental period. This is a period where genes are the primary source of control. From the fetal stage on, our perceptions of the environment determine what is going to happen to the rest of our development.

Genetic Engineering

Today we're dabbling with genetic engineering. In so doing we've created a great number and variety of genetically engineered crops. What we are not considering is the consequence of putting those crops into the real world. We are now finding the engineered genes we put into certain genetically modified organisms moving through the ecosystem and being picked up and used by other organisms. For example, in efforts to make plants resistant to a poison that is used to kill surrounding weeds, scientists engineered crop plants with poison-resistant genes. It was later found that

these plants passed the engineered genes on to all the other plants around them resulting in the creation of “super weeds” that no longer can be killed by the usual agricultural poisons.

The point is that all organisms are part of a community and share their genes. It has also been recognized that when we eat genetically modified foods, the bacteria in our gut can pick up and incorporate the food’s genetically engineered genes. Our tampering with Nature is even changing the genetic organization of the bacteria within our own digestive system! *We will probably only find out the costs of genetic engineering when the fruits of our labor come back to bite us.*

Dealing With Stress

Survival is very much tied in with growth mechanisms that replace the number of cells we lose every day as a result of normal attrition. But another part of our survival behavior engages a completely different set of mechanisms: those we use for our *protection*. Protection shuts down growth processes and allocates energy to behaviors needed to sustain us in a threatening situation. We engage in either growth or protection mechanisms every moment of our lives, funding these activities with our life energy. It takes energy to grow and it takes energy to protect ourselves. When we engage in protection mechanisms, we close ourselves down and conserve energy by shutting off growth.

Nature designed us to use protection in acute responses like running away from a saber tooth tiger. But if we maintain protection for too long, we compromise our survival. What really becomes important is this: how much of our lives are in growth and how much in protection? The more we live in fear, the more we allocate our energy into protection. The more afraid we become, the more we shut down growth—to the extent that we can be scared to death. In the world that we live in today, the protection response has become a greater and greater percentage of our everyday life experience; most of us are living in very high levels of stress and are continuously debilitating our system by interfering with growth. Cells cannot move in both directions at the same time. They are either in growth, open to the environment and assimilating what’s going on, or in protection, shutting themselves down waiting for the environment to clear itself before again expressing their normal functions. We are a community of cells that responds to perceptions generated by our central nervous system.

Today we have fears from which we seemingly can’t escape. Who is Al-Qaeda and where are they? Where is the bird flu? We are presented with fears that threaten our survival, perceptions that cause us to question whether we can stay alive. Those perceptions cause us to get into a protection posture and shut down life-conserving growth. This is important because it affects almost everybody on the planet today.

We have two different protection mechanisms. The immune system deals with internal threats like viruses, bacteria, parasites, or cancer cells. The adrenal system secretes stress hormones that protect us against exterior threats like a poisonous snake or an attacker. Stress hormones cause the blood vessels of the gut to constrict and they also cause the immune system to shut off. The reason for that is very obvious: if you are being chased by a lion, you don't put energy into fighting off a bacterial infection; you put it all into running. The medical professional has known for years that stress hormones shut off the immune system. They provide recipients of grafted tissues or organs with stress hormones, so that their immune systems do not reject the grafted foreign tissue. But what does this mean in the operation of our day-to-day lives? Every day, as we experience stress we're debilitating our immune system.

As we repress the immune system, common everyday things can start to take over and create disease. Most people are very familiar with this because as we find more stress in our lives we get weaker and sicknesses becomes the way of life. Kids at school, for example, are more likely to get sick around exam time. The concept that we have to catch something is silly because it turns out that most of us have almost all of the pathogens that affect humans in our bodies already. The stress that inhibits the immune system also shuts down growth processes that replace cells lost to normal attrition. With enough stress, there will be a point where the numbers of cells lost and not replaced will compromise our functions and we will start to express a disease.

There is another factor of stress that I refer to as "adding-insult-to-injury." Stress hormones cause the blood vessels in the forebrain to constrict, forcing the blood to the hindbrain to nourish the high-speed reflex center used in stressful conditions. Basically, constricting the blood vessels in the forebrain shuts down consciousness and intelligence. So an interesting and unwanted aspect of the stress response is that we become less intelligent when we are under stress. Therefore, a group of people or a nation that is bathed in fear is less intelligent than a nation that is living in growth and harmony; those living in fear will make "hindbrain" reflex decisions that may be inappropriate. This may account for some of the conditions of the world we live in right now because the fear levels are so great. It becomes incumbent upon us to recognize that our biology doesn't know the difference between a real fear and a made-up fear. The simple reality is that our perceptions and beliefs, whether right or wrong, are still going to control our biology.

Our biology did not intend for us to engage stress mechanisms as a twenty-four hour, 365 days a year event. It was designed as a response to an acute event; the rest of the time we should be maintaining growth. Yet the world that we have chosen (the media, the government, et cetera) really encourages us to live in ongoing fear and it causes great debilitation of our physiological maintenance and the neurological and immunological characters that we express. It is important for us to

understand that if we change our perceptions, we can change our biology and our world. We must stop living in fear because it is killing us as individuals and threatening our existence as a species.

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The Wisdom of Your Cells

Part 3

by Bruce Lipton

Every cell is an intelligent organism. You can remove it from the body, put it into a Petri dish and it will manage its own life: handle the environment, grow, reproduce and form communities with other cells. In the human body we are dealing with a vast community of cells working together in harmony. In a culture dish, cells behave as individual entities. However, in a body cells act as a community; individuals really cannot do whatever they want because then the coherence of the group will fall apart. Therefore, when cells come together in a community they acquire a central intelligence that is involved with coordinating the activity of the individual cells in the group. The cells actually defer to the higher order of that central voice. A human organism is a community of upwards of fifty trillion cells operating in unison and harmony, trying to conform to the requests and demands of that central voice. And it is the central voice that acquires and learns the perceptions that we must deal with throughout our lives.

There are three sources of life-controlling perceptions. Source number one is genetics, which provides for *instincts* common to all humans, basic things such as automatically pulling your hand out of the fire. A second set of perceptions is derived from the subconscious mind, the part that controls all the functions we don't have to think about. Once you learn how to walk, the program to control walking becomes part of the subconscious mind. You just have to have the *intention* of walking and the brain will coordinate the behavior. The third source of perceptions is from the conscious mind. The conscious mind can rewrite any of the subconscious programs you acquired and you can even go back and change the genetic activity. The conscious mind is unique because it can change an entire history of perceptions in order to engage in different behaviors and life styles.

How Babies Learn

In human development, when a sperm and egg come together their fate is presumed to be controlled by the inherited genes. The role of the woman in fetal development has primarily been restricted to her contribution in regard to nourishment via the components of her blood that pass through the placenta to the fetus. But her blood contains a lot more than just nutrition. Blood contains all of the information molecules as well, such as hormones and emotional chemicals. The mother is always adjusting her physiology and her emotions to deal with the contingencies of life. Since her blood via the placenta is directed to the fetus, the fetus is experiencing and feeling what the mother senses. This is a super-intelligent idea on the part of Mother Nature. Since the fetus, when it is born, is going to live in the same environment that the mother perceives, the mother is helping the fetus "adjust" to current world conditions.

If the mother perceives the world as threatening, this sends completely different signals to the fetus than if she perceives the world as a warm, supporting place.

When stress hormones cross the placenta they have exactly the same target sites in the fetus as they have in the mother. They cause the fetal blood vessels to be more constricted in the viscera, sending more blood to the periphery, preparing the fetus for a fight/flight behavioral response. In a developing fetus this is going to enhance the development of the musculoskeletal system and make a bigger body, with a coordinated increase in the hind-brain function to control that response. In a truly unstable world, this mother is creating a child that will have a great advantage because its ability to be a fighter and survive is greatly enhanced. Yes, the genes control the unfolding of a body plan but how you enhance some organs and take away from other organs is based on the flow of information chemicals that are transported from the mother's blood into the placenta.

It is now recognized that when the child is born he is fully capable of experiencing almost all the emotions of adults. Newborns can express rage, jealousy, anger, love and sadness. It turns out that both the mother and father are actually tailoring and shaping the child's physiology and behavior to fit into their world. If the parents find the world troubling, their child will be affected. For example, when parents do not want a child, this information, in the form of emotional chemistry, is crossing the placenta! The fetus already knows that its support is not guaranteed. It is clearly important for us to recognize that creating a child is a very important, dynamic, interactive process between the parents and the fetus. In fact, recent understanding in human pathology clearly reveals that issues that affect us as adults, such as cardiovascular disease, cancer and obesity, actually have their roots in the periconceptual, fetal and neonatal phases of life. The conditions under which a child is developing in utero profoundly shape her for the rest of her life in regard to behavior and physiology

When the child is born, it will stare into the faces of its parents and within hours it learns to read their facial expressions. The reason for this is very important-the facial expression of the parent serves to instruct the infant about its new world. As the child explores its world, if he encounters something "new" and the parent's face expresses concern or fear, it immediately_learns_ that thing should be avoided. The child will back away from whatever he perceives as threatening, and that is a healthy response for his life. Through this bonding and in all their interactions, the parents are programming the responses of the child. When parents are not there and do not follow through on this bonding, it leads to problems in development, referred to as attachment disorders. Such children have trouble focusing and express characteristics similar to attention-deficit disorder. Science has documented how responses to the world that we acquired from our parents are profoundly important in shaping our own physiology, our health and the diseases that we may experience later in life.

Fitting Into Society

Here is how a child learns to rapidly fit into society: a child's brain can download experiences at a super high rate of speed. From the moment a child is born through about the first six years of life she is in a super-learning state. Children learn and assimilate from how we treat them and how we respond to each other. We understand through hypnosis that you can download information into someone's subconscious mind and bypass the conscious mind. Why is this relevant? Because between birth and age six, the child's EEG brain activity is operating in a hypnotic trance state, so that whatever the child is learning is being downloaded into the *subconscious* mind. The subconscious mind "records" and habitually plays back these programs. Think about all the rules of society, about every way we live, the nuances of our language. A three-year-old child can learn three different languages at the same time and not confuse their grammar, vocabulary or syntax. By age eight or nine just learning one new language is difficult. What is the difference? When the child is under six, the conscious mind is not developed so it does not interfere with the programming. Observed life experiences are directly downloaded into the subconscious mind. At this time, the child also develops an idea of self-identity and these programs play throughout life.

The Power of the Mind

We are powerful and we are capable of doing things that are called miracles. Miracles are actually events that science does not understand yet. Very profound miracles happen every day. For example, some people have cancer and suddenly their perception changes and they may experience spontaneous remission. By changing their perceptions of life, they reprogram their cells. That is the expression of epigenetic mechanisms, molecular processes that give the power back to the individual. Rather than perceiving that "we are victims of the cells," the new science recognizes the power that we have to control the cells.

There are many stories throughout history that reveal the power of our thoughts. The placebo effect is really the "perception effect." If you believe that something is going to help you, that belief itself can lead to the healing process. Among the biggest selling drugs on the market are the SSRI drugs-things like Prozac and Zoloft-and it has been revealed by the drug companies themselves through the Freedom of Information Act that these drugs turn out to work no better than placebos. The placebo effect is something that we have not really taken advantage of, the idea that beliefs can control our biology and physiology. In fact, it is now established that one third of all medical healings, including surgery, are the result of the placebo effect.

But what is most important and what has been left out of the picture is the equal and opposite effect called the "nocebo effect." This is when a negative thought or belief is used to shape our biology. For example, if a professional person, a medical doctor or specialist, says you are going to die in three months and you believe him, then you may set this date into your perceptual clock, start to disentangle yourself from your

life and actually die in three months. Basically the placebo and nocebo effects are two sides of the same coin and simply represent the *perception* effect.

But here comes a problem: the conscious mind can process about forty bits of data per second but the subconscious mind can process forty million bits of data in the same second. The relevance is simple. The subconscious mind is one million times more powerful as an information processor than the conscious mind. We all believe that we run our lives with a conscious mind. *This is what I want from life. I want to do all these wonderful things.* Yet our life doesn't match our intentions; as a result there is a tendency to say, "I can't get the things that I want, _ the world is not providing them to me _." We take on the role of victim. New insights have completely revolutionized this idea. We now recognize that ninety-five to ninety-nine percent of our cognitive activity comes from the subconscious mind; less than five percent is influenced or controlled by the conscious mind.

When we are doing affirmations or positive thinking, we are using the tiny processor that has less than five percent influence, which means that we have to depend on *willpower to overpower the subconscious mind*. That is a nearly impossible job because the moment we take our eye off the ball, we automatically go back to the preset programs that are in our subconscious mind. Positive thinking is a good idea, much better than negative thinking, but while you are engaged in positive thoughts using the conscious mind, the subconscious mind with its limiting and self-sabotaging programs is running the show! Consequently, positive thinking does not improve the situation for most people.

It is not that the conscious mind is not powerful, for it can run anything in the human body. We used to think it could only run the voluntary system-the skeletal muscles, arms and legs. But yogis have revealed that the conscious mind can change body temperature, blood pressure and heartbeat. The conscious mind, if it focuses on any part of the body or any function, can control it. But the conscious mind, being a small (40 bit/sec) processor, doesn't have the capability of controlling as many things at the same time as the subconscious mind can, operating at 40 million bits/sec.

Most people hardly use the conscious mind. They run their day-to-day existence from programs stored in their subconscious mind. What programs will that subconscious mind run? The answer is the exact programs that were downloaded into it. No variations on a theme. What it has learned it will play for its entire life unless we go into the subconscious mind and rewrite the program. The conscious mind is frequently oblivious of the programs running from the subconscious mind because the conscious and subconscious minds operate in tandem: one does not observe the other. So if the things in my life are not what I'm looking for, is it because the universe isn't offering me the opportunity or is it because I'm sabotaging myself? Almost inevitably we are sabotaging ourselves with limiting programs stored in our subconscious mind.

Must we go back and identify how the subconscious programming occurred? Absolutely not. The subconscious mind does not have a future or a past. It is handling the present moment all the time. A signal from the environment comes up, pushes the receptor that engages the effector that then coordinates the response. That is the subconscious mind. There is nobody in there. There is nobody to talk with or negotiate with in the subconscious mind. We must find other ways of influencing and impacting the subconscious mind's programming. One approach is what Buddhists call *mindfulness*-to be fully conscious all the time and make decisions with your creative mind, not from your habitual subconscious mind. The Yoga paths all provide various such practices. Other approaches include clinical hypnotherapy and a new field of diverse modalities that are collectively called "energy psychology," ways of identifying and rewriting belief programs in our subconscious minds.

Taking Personal Responsibility

The new biology is very important for it addresses why we lack personal responsibility, why we do not recognize how powerful we are in controlling our lives and controlling what happens in our world, why we are on the path where we are facing extinction, and why our world is falling apart. We are destroying the environment. We are in crises of all kinds including a health crisis. The fears we are experiencing are worsening the healthcare crisis because our fears cause protection responses that shut down growth mechanisms and the function of the immune system. We are in an escalating cycle of fear and ill health. All this is a wake-up call. It is up to us as individuals to finally *own* who we are.

The new sciences of epigenetics and quantum mechanics recognize the important role of the invisible fields in controlling life, which includes the thoughts and energies that contribute to our reality. This new awareness changes our old worldview. We now know that we control our genes. We control our lives. Our thoughts are real and tangible. They influence our physiology. Physicists are now beginning to recognize that the *universe is a mental construct*. Knowing these things we become empowered. The programs in our subconscious minds are downloaded as the life we are experiencing. What we have to do is review our lives and identify the things we want to change. The things that we strive for and don't work generally reflect a subconscious program that sabotages our efforts to get there. We do not have to go back and find out how we acquired that program; that would be tantamount to killing the "messenger" over the "message" (the resulting acquired subconscious program). Though we can rewrite subconscious programs using a variety of methods, until we do, we are actually victims of our subconscious minds. Not victims of the world, victims of our own belief systems. When we clear these pathways we become empowered. Then and only then will we likely experience what Jesus said: "You could do all these miracles even better than I, once you *believe* you can."

You must recognize something that I also had to recognize. It is not just acquiring the awareness in my conscious mind; it is actually applying that awareness into my

life that makes the change. While the mind can lead us there, we actually have to do something to manifest the magic in our lives. We are in a desperate race to change who we are and what we are so that we can bring our environment and our planet back into harmony, to bring back the opportunity for our survival. We are all cells in a larger organism called humanity. When we have that belief we will start supporting each other instead of killing each other. Our future lies in recognizing that we are far greater as a whole than as individuals.

Think about it this way: underneath your skin are fifty trillion cells living in harmony in a very closed environment. These cells are very intelligent. We have always looked down at everything less than human as not being intelligent. That is our hubris and it is going to cost us a lot. If you can look inside the body and see those trillions of cells living in harmony, recognize this: every cell is a sentient being just like every one of us. Every cell lives in a community and has a job to support that community. There are rules and regulations. Cells get services. There is health care by the immune system. The garbage is taken out by the excretory system. The digestive system delivers the food. There is a society consisting of trillions of individuals inside our bodies that can thrive when we are in good health, yet the few billion people on the entire surface of the planet are so out of balance that we are destroying our environment.

This understanding returns us to the age of mystical belief that offered, "The answers lie within." If we want to understand how to structure a human population of a few billion people on our planet, the answer lies under our skin. Humans are evolving. Humanity will complete itself as a multi-human community and at that time we will recognize that when we fight others, we are fighting ourselves. Humanity is a single body containing cells and each one of us is a cell in that structure. When we understand that, we should stop harming each other and start organizing ourselves into the social structures that reflect what is going on in the human body. When we arrive at that point, the Earth will complete its evolution as a single living cell. What is our role in that living Earth cell? We are the equivalents of the proteins in the Earth's cell membrane. We are the "receptor" proteins on the surface of the earth that receive the signals from the environment and the "effector" proteins that engage in the behaviors that control the expression of the planet!

We have lost our original mission statement. The aboriginals that are still here remind us that we are the gardeners and what we have done to this point is devastate the Garden. But as we evolve we will start to recognize the power of our consciousness. We must organize our lives now to plan for the future. We can create a whole different experience on this planet. When the planet completes its evolution it will be an individual living cell. Evolutionary history reveals that every time a level of development completes itself, it joins other similar entities to create a more powerful social structure. Therefore, I anticipate at that time that we will begin to interact with other earths, other cells out in space, and start to create a large matrix

of living cells as planets that constitute the universe. We have great hope and possibility before us. We are living in a very supportive garden, a garden that should support all of us, where we can enjoy life and peace, prosperity and happiness.

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