# Human Genetic Potential And Upper Cervical Chiropractic

BY KEITH WASSUNG

# HUMAN GENETIC POTENTIAL AND CHIROPRACTIC

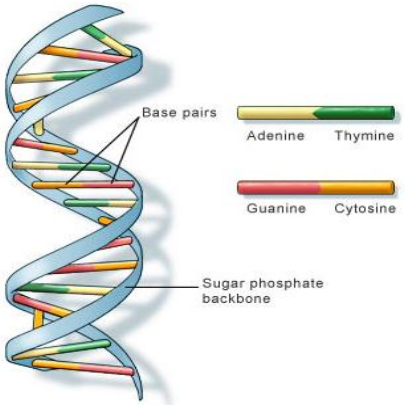
The 21st century promises to be packed with exciting technical research and innovations and none is more promising than the rapidly growing field of human genetics. The next one hundred years can truly be called the century of human genetic potential.

### FOR DNA: A DEFINING MOMENT

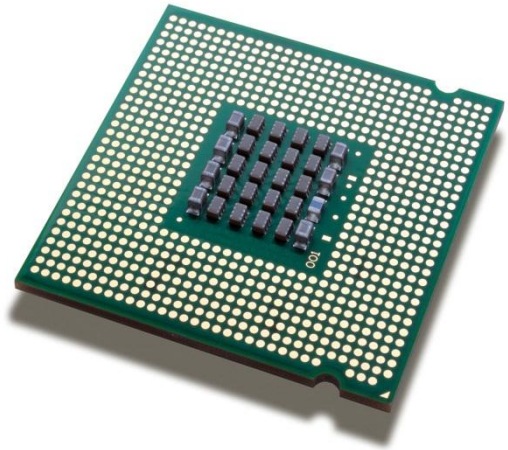
For a decade, the double stranded thread of genetic code known as the human genome project has been the object of the biggest and boldest biological enterprise ever launched, costing about two billion dollars and requiring millions of times the computing power used to land a man on the moon. The Human Genome Project, formally begin in 1990 with the goals of identifying the estimated 100,000 genes found in DNA, determining the sequence of the three billion chemical base pairs in DNA and storing information. [1]

# FUNDAMENTALS OF GENETICS

**Human Cell**: Each of the 100 trillion cells in the human body (with the exception of red blood cells) contains the entire human genome—all of the information necessary to build a human being. This information is coded into three billion base pairs, sub-units of DNA (egg and sperm cells have half this amount of DNA.)




**The Cell Nucleus:** Inside the cell nucleus, six feet of DNA are packaged into 23 pairs of chromosomes. (one chromosome from each parent is in each pair)



As a carrier of information, DNA is 45 trillion times more efficient than the most advanced silicon computer mega chip, which is made by high skilled teams of design engineers

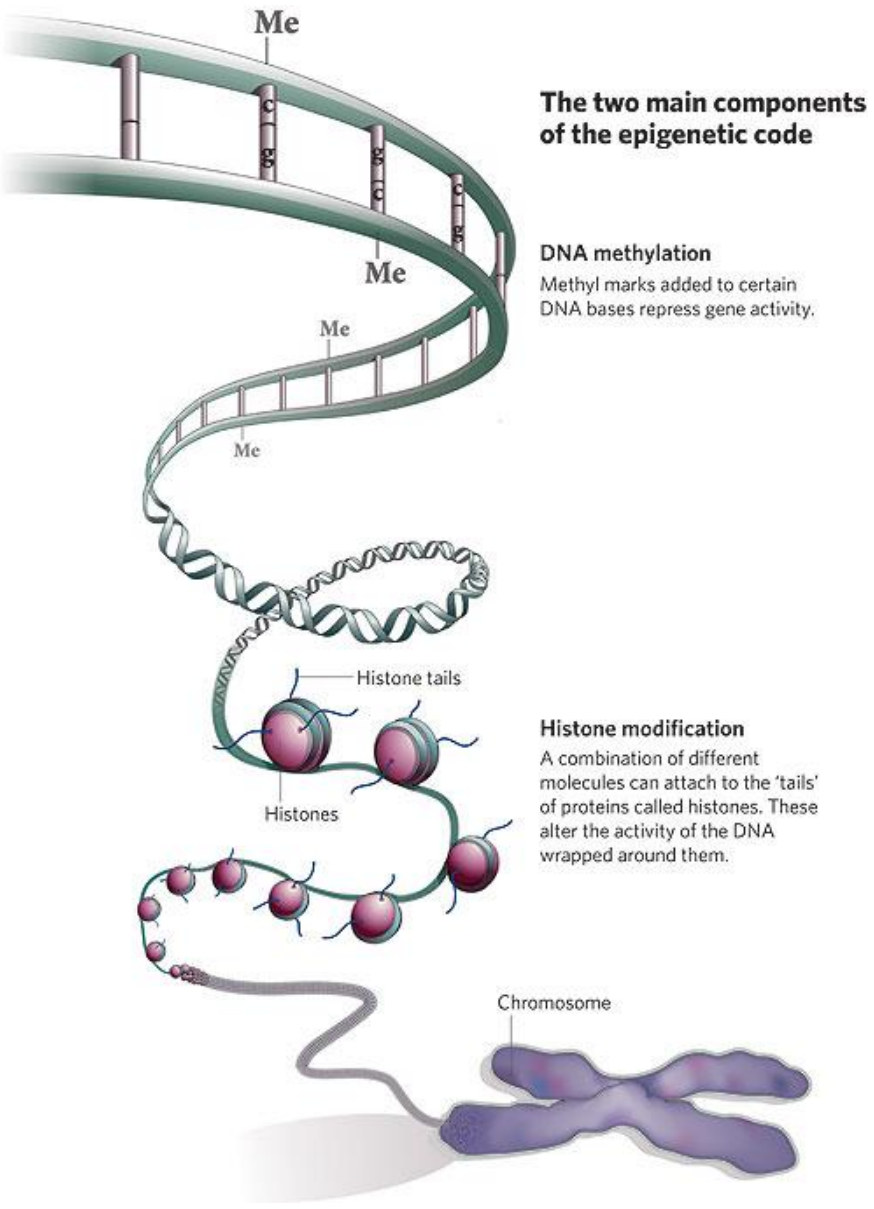
**Chromosomes**: Chromosomes contain the DNA for hundreds of thousands of individual genes—the units of heredity. Two of these sets are sex chromosomes that determine our genetic sex; the other 44 are the 22 pairs of autosome traits.

**Genes**: Each gene is a double—stranded DNA that holds the recipes for making a specific molecule—usually a protein. These recipes are spelled out in varying sequences of four chemical bases in DNA. A (Adenine), T (Thymine), G (Guanine) and C (Cytosine). The base pairs form interlocking pairs that can fit together in only one way. “A” pairs with “T” and “C” pairs with: G”.

**Proteins:** Proteins (Greek for “primary element”) are made up of polypeptide chains that in turn make amino acids, which are the body’s essential components of all organs and chemical activities. Some proteins, called enzymes, control the chemical reactions that occur within living things. The structure of a gene—that is the instructions contained in its DNA—determine which protein it makes and when it makes it

**RNA:** Ribonucleic acid is a single-stranded molecule located outside the nucleus that can be considered a ‘chemical slave” of DNA. RNA carries out the orders for a protein synthesis issued by DNA. There are three forms of RNA that work together to carry out the instructions of the DNA. They are:

1. **transfer RNA (tRNA)**
2. **ribosomal RNA (rRNA)**
3. **messenger RNA (mRNA)**




Genes are expressed in two steps. The first step is transcription, in which many different RNA molecules are synthesized from genes in DNA.

**Transcription** is the process by which genetic information contained in the sequences of bases (genes) in DNA is transferred into a complementary sequence of bases in RNA.

The information is further deciphered into the next step of gene expression, **translation,** which converts the genetic information carried in the sequence if bases in RNA into a sequence of amino acids that determine a particular proteins structure and activity in the cell.

**Genetic Mutation;** A gene mutation is a permanent change in the DNA sequence that makes up a gene.

Mutations range in size from a single DNA building block (DNA base) to a large segment of a chromosome. Gene mutations occur in two ways: they can be inherited from a parent or acquired during a person's lifetime. Mutations that are passed from parent to child are called hereditary mutations or germ line mutations (because they are present in the egg and sperm cells, which are also called germ cells). This type of mutation is present throughout a person's life in virtually every cell in the body.

Mutations that occur only in an egg or sperm cell, or those that occur just after fertilization, are called new (de novo) mutations. De novo mutations may explain genetic disorders in which an affected child has a mutation in every cell, but has no family history of the disorder.

Acquired (or somatic) mutations occur in the DNA of individual cells at some time during a person's life. These changes can be caused by environmental factors such as ultraviolet radiation from the sun, or can occur if a mistake is made as DNA copies itself during cell division. Acquired mutations in somatic cells (cells other than sperm and egg cells) cannot be passed on to the next generation.

**"X-rays, viruses, toxic chemicals and drugs can increase the likelihood of a change to the DNA, causing mutation that may lead to cancer and other disorders of the body"** [2]

HUMAN GENETICS

Genetic research will lead to enormous potential in the fields of genetic testing and gene replacement therapy. However, the advent of this new technology should not be construed to mean that genetics represent the only factor affecting health. Indeed, emphasis and education on lifestyle, as well as environmental and structural factors will play a tremendous role in 21st century health care.

**The environment in which you grow up is as important as your DNA in determining the person you ultimately become. You cannot disassociate genes from the environment that turns genes on and off; and you cannot disassociate the effects of genes from the environment in which proteins exert their effects. Certain genes lead to vulnerability, but not inevitability**.[3]

**NEWSWEEK**

For example, when geneticists say they've found a gene for a particular trait, what they mean is that people carrying a certain "allele"--a variation in a stretch of DNA that normally codes for a certain protein--will develop the given trait in a standard environment. The last few words--"in a standard environment"—are very important, because what scientists are not saying is that a given allele will necessarily lead to that trait in every environment. Indeed, there is mounting evidence that a particular allele will not produce the same result if the environment changes significantly; that is to say, the environment has a strong influence on whether and how a gene gets "expressed." [4]

**US NEWS AND WORLD REPORT**

## THE GENE IS NOT NECESSARILY DOMINANT

*Genes* are unquestionably the fundamental units by which our bodies are constructed. However, pure genetic determination does not adequately explain the varied capabilities of our biology. A more accurate view of the role of the genome is to see the genes as providing the overall plan for the developmental pathways. The environment to which the individual is exposed will modify the actual pathway" [5]

**PETER NATHANIELS. MD**

Just as genetics plays a role in the development of many health conditions, so do the conditions and circumstances of our lives and the decisions we make. Heredity may influence a person's health but so does the habits and decisions that are made well. For example, some people may have genes that put that at risk for cancer. However, their chance of actually getting cancer will be less if they do not smoke. Some individuals have genes that put them at risk for diabetes, but they may never get diabetes if they engage in a healthy lifestyle

"The major function of your genes is to transmit health and the inborn resolve to remember wellness. In the sickness paradigm, we are taught that disease-carrying genes determine our destiny. This is a false view. If we were truly destined to live by our genes, we would suffer from the thousands of diseases experienced by our ancestors for as long as we lived, which would not be very long at all. Disease-carrying genes are not our destiny, because they must answer to our inner compass-our healing force." [6]

**EDWARD A. TAUB, MD**
"America's Wellness Doctor"

Research has revealed that there is no simple link between genes and health conditions. Genetics have something---but not everything—to do with health conditions. Genetics do not necessarily equal fate.

## A NEW MODEL OF HEALTH CARE

Research projects around the world are showing great promise for the future of health care, and although these projects have barely scratched the surface, genetics research continues to rapidly change the way we view health care—from a disease and symptom model to one of performance and maximizing the inherent healing potential of the human body.

**GREATER EXPECTATIONS: The future of health care lies not in treating illness, but preventing it**

To maintain a high level of fitness, we must avoid physical decline—not repair it. Open heart surgery, even at its most effective, will never make the heart as good as new. The most effective preventive measures involve change in lifestyle. In addition, as genetic profiles and other predictive tools improve, the art of prevention will grow more sophisticated. Pressed by patients and advancing technology, health care will soon change its focus from treatment to enhancement, from repair to improvement, from diminished sickness to increased performance. The transformation has already begun. Accompanying this will be an increased emphasis on psychoimmunology, the science that deals with the mind's role in helping the immune system to fight disease, which will become a vitally important clinical field — perhaps the most important field in the 21st century.[7]

**Michael Crichton, MD**

**"Health Care is going to change from treatment-based to prevention-based discipline."**[8]

William Haseltine, Chairman Human Genome Science

"There is an alarming high number of disabling conditions-chronic diseases, most cancers, syndromes and other instances of poor health where western medicine is helpless. There is no root cause, no definite problem that surgery can eradicate or drugs can cure. A large part of the problem has to do with the theoretical framework that modern medicine has taken on, namely that of ignoring the workings of the body itself" [9]

**Dr. I. William Lane, "Immune Power"**

## THE BODY'S HEALING SYSTEM

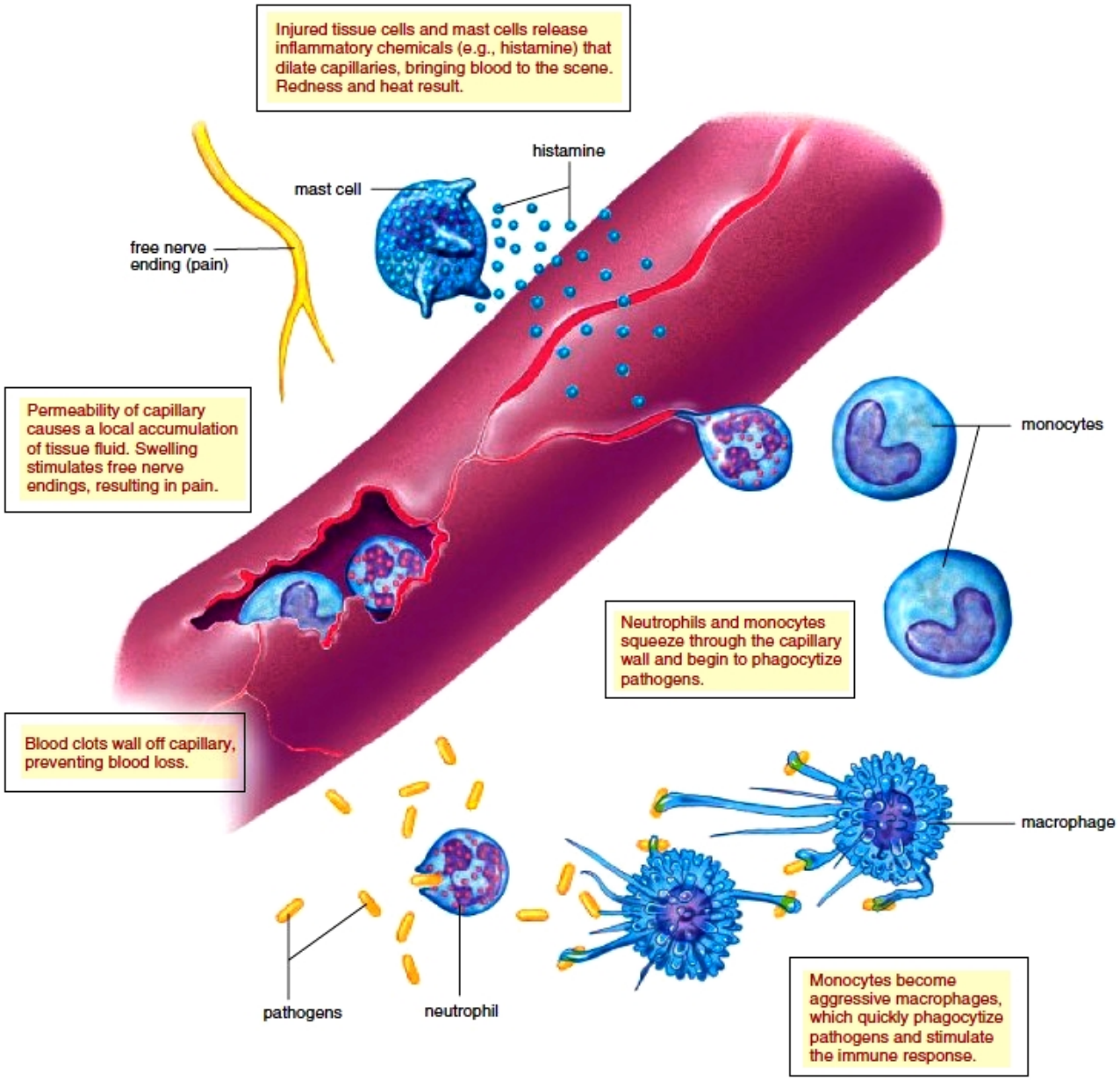
**Genetic research, coupled with recent immunology research has clearly demonstrated the effectiveness and efficiency of the body's healing system.**

"The fact that healing is a natural power is a concept that is missing from traditional medicine. This seems to be the greatest defect of modern medicine—a defect that has immense practical significance since it underlies our ability to find cost effective solutions to common health problems."[10]

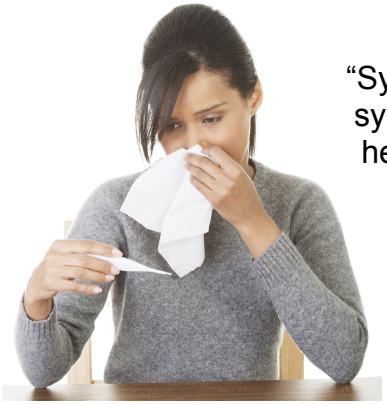
**Andrew Weil, MD**

"An automatic self-healing ability is programmed into our body's genetic blueprint. The wisdom and "know-how" behind the body's functioning is extremely complex. The body's innate wisdom is more powerful than all of the accumulated knowledge of the human race. As we respect this by properly meeting the "essentials of health" we can utilize the "self-healing" blueprint that already exists within us." [11]

Arthur Baker
THE WONDER MACHINE




When cells are damaged, either externally through physical trauma or internally by toxins or parasites, the damaged cells release hundreds of chemical messengers that communicate the occurrence of damage to the central nervous system. The CNS responds by sending nerve messages that begin, coordinate and facilitate the entire healing process. The cardinal signs of inflammation—such as heat, fever, redness and pain are all signs that the healing process is proceeding on schedule.



"Symptoms represent the body's best efforts to heal itself, therefore by treating symptoms you are suppressing the body's natural response and inhibiting the healing process. Rather than treating symptoms, doctors should concentrate on stimulating the body's defenses to allow for completion of the healing process." [12]

**Dt. Stephen Cummings**

# CENTRAL NERVOUS SYSTEM & HEALING

The human body is a masterpiece of natural engineering. It can perform an amazing number of feats—from sprinting down a football field to catch a pass to converting air molecule vibrations into the sensation for sound. It metabolizes food into the exact combination of nutrients that the body requires for energy and transports vital materials around a complex interior network. It also defends and repairs itself when it is either attacked by harmful germs or when it is injured. At the controls is the most sophisticated super computer in the world—the central nervous system.

"To understand health is to understand the central role of the brain and nervous system in maintaining the resistance of the body. Health maintenance is the primary function of the brain, not educational thoughts, language, poetry and other functions usually associated with the brain."[13]

**Robert Ornstein, PhD & David Sobel, MD**
**The Healing Brain**

**"The quality of healing is directly proportional to the functional capability of the central nervous system to send and receive nerve messages."** [14]

Janson Edwards, MD. PhD

"An intact nervous system will lead to optimum function of the human body." [15]

**Dorland's Medical Text**

**"The nervous system is the most complex system in the body and it is estimated that as many as half of all genes are expressed in the nervous system. The intricate sequence of events leading from the earliest origins of the neural tube to the adult brain, spinal cord and peripheral nervous system is a complex process of gene expression and regulation**." [16]

DEVELOPMENTAL BIOLOGY

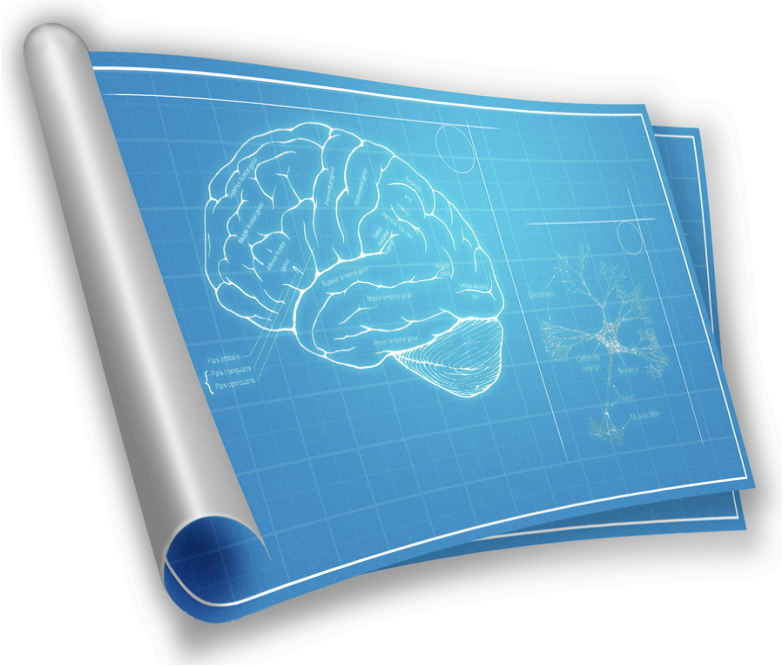
**The proper development and function of the nervous system is a primary key to maximizing the human genetic potential of health, healing and performance.**

## Molecular Genetics in Developmental Neurobiology

Molecular genetics in neurobiology has developed rapidly with the introduction of the new and productive methodologies of genetic engineering and cellular manipulation. Particularly in the field of developmental neurobiology, molecular genetics has had impact in research on the molecular mechanism if development and differentiation in the nervous system.

**SYMPOISA OF BRAIN SCIENCES**

**Every doctor, scientist and researcher in the world will agree that the foundation of health begins with a properly functioning nervous system. The central nervous system is the master control system in the human body and every single function reflects its activity.**



Nerve impulses travel from the brain, down the spinal cord, and out through nerves to all parts of the body. Nerve impulses then return to the brain through return pathways.

**There are approximately 100 billion neurons, or nerve cells, in the brain and in a single human brain; the number of possible connections between those cells is greater than the total number of electrons in the universe.**

Research has shown that activity that occurs at the molecular levels is controlled and coordinated by the central nervous system.

"The nervous system does much more than transmit sensory information to the brain or control motor functions. It actually controls the peripheral organs, including its biomolecular environment. The Central Nervous System is involved in all disease conditions as the CNS not only processes incoming physical and chemical information from the body, it actually controls organs and cells to maintain health and homeostasis." [17]

**MEDICAL HYPOTHESIS**

"We can only conclude that an analog-transmission and control system exists in the body, located in the perineural cells and transmitting information by means of the follow of semi-conducting DC electrical current. This system senses injury and controls repair, and it may serve as the morphogenic field itself. It controls the activity of body cells by producing specific DC electrical environments in their vicinity." [18]

**ROBERT BECKER, MD**

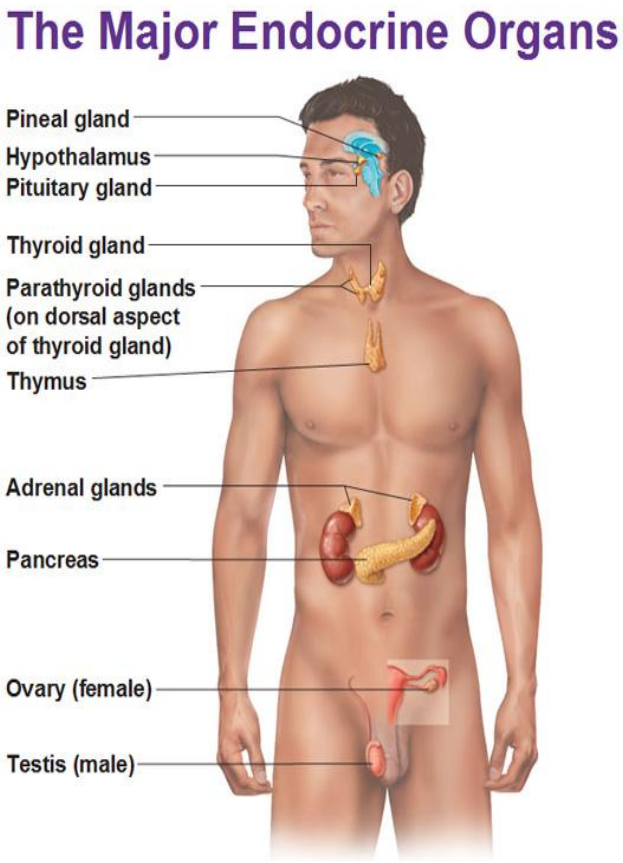
**There is a greater quantity of biological communication in the human body than all of the man-made communication systems in the world combined. Signaling is essential to genetic expression**

"No one could survive without precise signaling in cells. The body functions properly only because the cells constantly communicate with each other" [19]

**SCIENTIFIC AMERICAN**

“All body systems would be immobilized with the nervous system. It controls and regulates every body activity down the workings of the tiniest cell.” [20]

**WORLD BOOK ENCYCLOPEDIA OF SCIENCE**




Hormones, which get their name from the Greek word meaning to “urge on”, are the body’s internal chemical Messengers. They carry the information that controls the function of much of the body’s tissues and cells. Researchers have discovered how the main endocrine (hormone producing) glands function. Some, but not all, are controlled by the pituitary gland, which is controlled In turn by the hypothalamus—both of which are located
In the brain

> Hormones teach every part of the body, and the membrane of every cell has receptors for one or more hormones that stimulate or retard a specific body function. The hypothalamus, located at the base of the brain, acts as the mastermind that coordinates hormone production, producing regulatory or releasing hormones; these travel a short distance through special blood vessels and nerve endings to the pituitary gland.” [21]
>
> **THE HUMAN BODY**

Hormones do not damage or alter genes; rather they cause the gene to act in a certain way telling it when to activate or reproduce. It is much like a transmitter sending signals to a cell phone or a radio. If the nervous system is working properly, then the correct chemical message is sent to and received by the genes.

To exert their powerful influence in the body, hormones must first bind with specifically tailored cell proteins called receptors. There are hundreds of different kinds of receptors, each one designed for a specific chemical signal. Within one cell, there are 10,000 or more of one type of receptor, although a small number need to be activated to elicit a response. The receptor and its hormones have an intricate and precise fit, much like a lock and a key, and this hormone receptor then binds to the specific regions of the DNA in the cell nucleus to activate specific genetic sequences.

## The central nervous system-endocrine-gene connection is the key to understanding and realizing our human genetic potential

The central nervous system is so vital to overall health and optimal genetic expression that it is encased in a Protective bony structure. The brain, which is protected by the skull, extends directly into the spinal cord, which is protected by the bones of the spine called the vertebra,

**A total of 24 vertebral bones form the spinal column, which is moveable to allow for mobility and shock protection.**

When the spine is in its proper structural position, the nerves are protected and optimal communication exists between the central nervous system and the rest of the body. This is when the body is best able to express its optimal genetic potential.

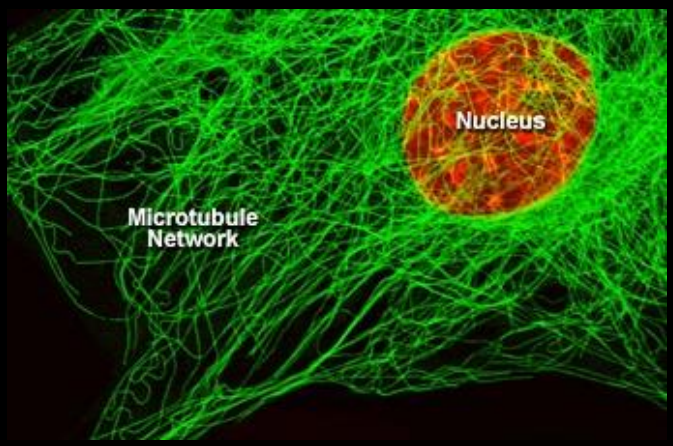
**"For all living cells, regulation of gene expression by extracellular neurological systems is a fundamental mechanism of development, homeostasis, and adaptation. The neurological mechanisms that underlie the control of gene expression are becoming increasingly well understood. Every conceivable step in the genetic sequencing process is subject to dynamic regulation by the central nervous system."**[22]

NEUROBIOLOGY

**It would stand to reason that a breakdown in the control and coordination of the nervous system would result in decreased genetic expression.**

**"Individuals with the neurofibromatosis type 1 (NF1) inherited cancer syndrome exhibit neuronal dysfunction that predominantly affects the CNS resulting in vulnerability to reduced genetic expression."** [23]

JOURNAL OF NEUROSCIENCE




"Microtubules are integral to neuronal development and function. They endow cells with polarity, shape, and structure, and their extensive surface area provides substrates for intracellular trafficking and scaffolds for signaling molecules. Consequently, microtubule polymerization dynamics affect not only structural features of the cell but also the subcellular localization of proteins that can trigger intracellular signaling events. Studies have shown that a reduction in the functioning of microtubules results in a reduction of gene expression." [24]

**U.S. National Academy of Science**

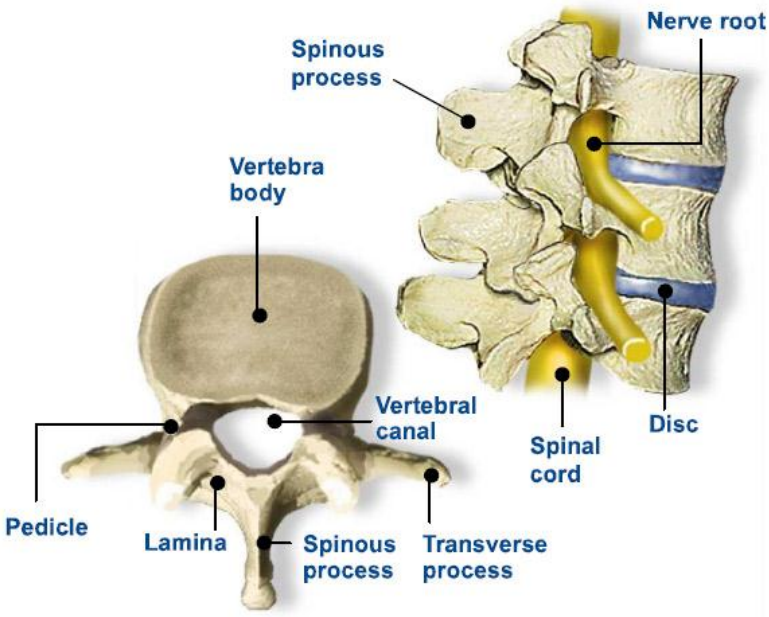
# VERTEBRAL SUBLUXATIONS

Disturbances to the nervous system are referred to in scientific literature by several names; *dysponesis, nerve dysfunction. neuritis, nerve impingement, double crush phenomenon, and subluxation,* all of which cause **interference** to the nervous system.

The primary cause of nerve **interference** is found in the spinal column. When the spine is in its proper position, it protects the nerve pathways.

However, when spinal vertebra become misaligned, **interference** to the nerve impulse occurs, which reduces the overall function of the nervous system and of that particular organ

Nerve disturbance caused by the spinal column is called a vertebral subluxation. Vertebral subluxations are often referred to as the "Silent Killer" because they can be present for long periods of time without any evidence of pain or symptoms.




This is similar to a cavity eating away at a tooth long before a toothache occurs. Subluxations irritate the nerves which interfere with the flow of nerve impulses. This reduces the body's inherent natural healing ability. Subluxations also alter the optimal structure of the spine which weakens it and increases degeneration. Vertebral subluxations are devastating to a person's health and are well documented by leading health authorities.

"Subluxation is very real. We have documented it to the extent that no one can dispute its existence. Vertebral subluxations change the entire health of the body by causing structural dysfunction of the spine and nerve interference. The weight of a dime on a spinal nerve will reduce nerve transmission by as much as sixty percent." [25]

**Chang Ha Suh, Ph D**
**Spinal Biomechanics Expert**

**"**Subluxations of vertebra occur in all parts of the spine and in all degrees. When the dislocation is so slight as to not affect the spinal cord, it will still produce disturbances in the spinal nerves passing off from the foramina." [26]

**Dr. James Woddersee, Neurosurgeon**

“Nerve dysfunction is stressful to the visceral nerve and other body structures and the lowered tissue resistance modifies the immune response and lessens the overall capability of the immune system.” [27]

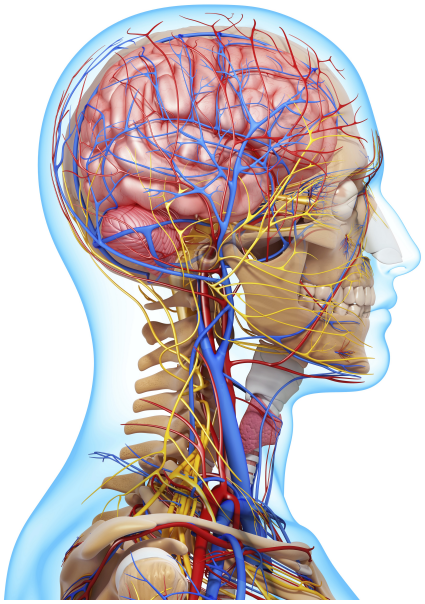
**Science**

“Hyper functional or Hypo functional neurons along a neural chain prevent normal nerve transmission causing disturbances in the homeostasis of the cells, tissues and organs.” [28]

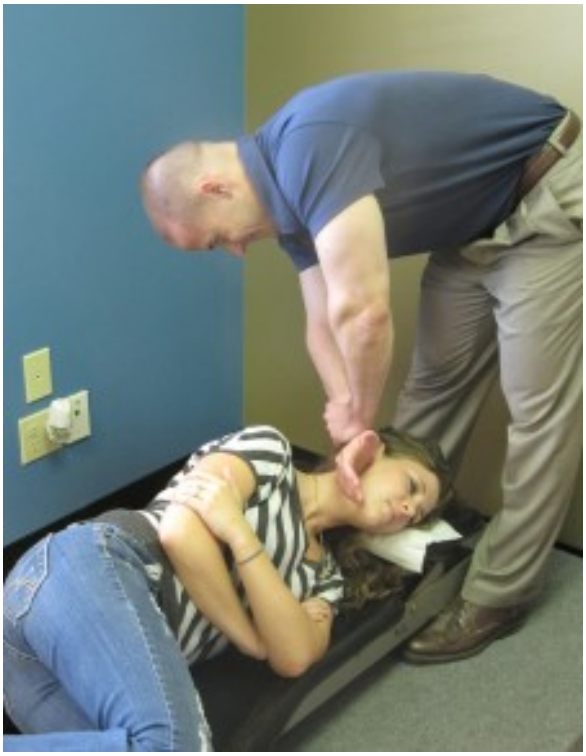
**Dr. T. N. Lee**
**Academy of Pain Research**

“Pathological changes have been observed at the cellular level after experimental compression of neural structures. These include Wallerian degeneration, dystrophic axons and occasional loss of myleniated nerve fibers.” [29]

**R. B. Delamarter, MD**



# CHIROPRACTIC AND GENETIC POTENTIAL



Doctors of Chiropractic have long understood and emphasized the importance of a proper nerve supply to overall health. Chiropractors detect and correct vertebral subluxations by physically adjusting the spine. This restores the nervous system to an optimal level of function, which maximizes the body’s inherent healing ability including the maximization of genetic potential.

“Recent advances in cellular science are heralding an important turning point. For almost fifty years, we have held the illusion that our health and fate were preprogrammed in our genes, a concept referred to as genetic determinacy. Though mass consciousness is currently imbued with the belief that the character of one’s life is genetically predetermined, a radically new understanding is unfolding at the leading edge of science. This new awareness is bringing conventional biomedical philosophy into close alliance with D.D. Palmer’s original Chiropractic philosophy.” [30]

**Dr. Bruce Lipton**

In 1975, Ronald Pero, Ph.D., chief of cancer prevention research at New York's Preventive Medical Institute and Professor of Medicine in Environmental Health at New York University, began developing scientifically valid ways to estimate individual susceptibility to various chronic diseases. Pero and his colleagues found strong evidence that susceptibility to cancer could be gauged by the activities of various enzymes involved in metabolic and genetic changes from exposure to carcinogenic or "mutagenic" chemicals. An individual's immune system responsiveness, or "immune competence," also was directly linked to certain DNA repairing enzymes that provided an objective way to assess disease susceptibility. Lack of those enzymes, Pero said, "definitely limits not only your lifespan, but also your ability to resist serious disease consequences."

Pero was fascinated by various hormones' synergistic relationship with other cancer-inducing agents to promote the disease. For example, thyroid hormones affect the early phases of radiation- and chemically-induced cancers. If the thyroid produces too much of either thyroxin or thyroid stimulating hormone, cancer risk greatly increases. And because the nervous system regulates hormonal balances, it too can influence susceptibility to cancer. Along these lines, various kinds of spinal cord injuries are accompanied by a high risk of developing cancer, particularly lymphoma and lymphatic leukemia.

This connection led Pero to consider chiropractic a potential alternative for reducing the risk of immune breakdown and disease. Measuring 107 individuals who had received long term chiropractic care, Pero's team had surprising findings. All chiropractic patients were `genetically normal," that is, they had no obvious genetic reasons for increased resistance or susceptibility to disease. Any difference, therefore, had to be accounted for by environmental or therapeutic factors.

The chiropractic patients also had 200% greater immune competence than those who had not received chiropractic care, and 400% greater immune competence than those with cancer or other serious diseases. Despite a wide range of ages in this study, immune competence did not show any decline with age; it was uniform for the entire group.

Pero concluded that "chiropractic may optimize whatever genetic abilities you have" so that you can fully resist serious disease. "I'm very excited to see that without chemical intervention this particular group of patients under chiropractic care did show a very improved response," he told CBSRF. "These changes occur from chiropractic treatment. [31]

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# THE EDUCATION AND TRAINING OF A DOCTOR OF CHIROPRACTIC

Educational requirements for doctors of chiropractic are among the most stringent of any of the health care professions. The typical applicant at a chiropractic college has already acquired nearly four years of pre-medical undergraduate college education, including courses in biology, inorganic and organic chemistry, physics, psychology and related lab work. Once accepted into an accredited chiropractic college, the requirements become even more demanding — four to five academic years of professional study are the standard. Because of the hands-on nature of chiropractic, and the intricate adjusting techniques, a significant portion of time is spent in clinical training.

Doctors of chiropractic — who are licensed to practice in all 50 states, the District of Columbia, and in many nations around the world — undergo a rigorous education in the healing sciences, similar to that of medical doctors. In some areas, such as anatomy, physiology, rehabilitation, nutrition and public health, they receive more intensive education than their MD counterparts.

Like other primary health care doctors, chiropractic students spend a significant portion of their curriculum studying clinical subjects related to evaluating and caring for patients. Typically, as part of their professional training, they must complete a minimum of a one-year clinical-based program dealing with actual patient care. In total, the curriculum includes a minimum of 4,200 hours of classroom, laboratory and clinical experience. The course of study is approved by an accrediting agency which is fully recognized by the U.S. Department of Education. This has been the case for more than three decades.

Records form insurance and court cases have constantly shown that chiropractic is the safest portal of entry health care available to the public today. Although no healthcare procedures are 100% safe, chiropractic stands on its record of safety and effectiveness unmatched in healthcare.

The chiropractic adjustment is a safe, efficient procedure which is performed nearly one million times every working day in the United States.

There is a singular lack of actuarial data that would justify concluding that chiropractic care is in any way harmful or dangerous. Chiropractic care is non-invasive, therefore, the body's response to chiropractic care is far more predictable than its reactions to drug treatments or surgical procedures. Of the nearly one million adjustments given every day in this country, complications are exceedingly rare.

**COMPLIMENTS OF**

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