Fulvic Acid, An Essential Nutrient

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There is far more to most things than meets the eye, the function of the human body being one of them. Most of what happens with respect to the creation and maintenance of daily life occurs outside the realm of sensory perception. Taste, hearing, sight, smell and touch help a person to experience the power and magnificence of Mother Nature, but provide little ability to comprehend the organization and function of the universe. Making sense of it all comes from the realm of the mind, an ethereal part of existence with an innate desire to answer the important questions of "who, what, when, where, why and how? Driven by an unquenchable thirst, mankind has continually advanced in knowledge, gradually making sense out of the seemingly unknowable and organizing what seems to be chaos. To be optimally healthy, a person must absorb and apply accumulated knowledge of both the seen and the unseen worlds that surround, contain and define life, especially electricity.

Starting from the ground up……

All life is composed of energy and matter. Matter is composed of elements from the periodic chart of elements. Elements are found in air, in water, and in the ground. Some of the elements are gases. Most of the elements are solid minerals (rocks). For the sake of this discussion, movement of all elements generates electricity that powers all of organic life. Minerals conduct the electricity from place to place. Minerals are required, therefore, to sustain and support all organic life. How do solid minerals get dissolved in water and move from where they are in the soil or in the water and flow from one place to the next, from one organism to the next? The simple answer is: complex organic polymers called humic substances, which are found in soil, in lake water and in ocean water. So that the principles of humic substance can be better understood and applied, a more detailed explanation follows.

Minerals are either inorganic or organic. Inorganic minerals contain no carbon. Organic minerals contain the carbon element. Minerals in water on in the soil must be converted from inorganic rocks to organic liquid solutions in order to sustain and support organic life. It is humic substances, also called humates, which turn inorganic minerals into organic minerals. Humates, therefore, are the bridge between inorganic and organic life. ***No organic life, including that of the human cell, is sustained without humates.***

Humates are the result of biologic and chemical breakdown of dead organic matter by symbiotic microorganisms living on the hair roots of plants. Humates have several components, each with a different color, as shown in ***Figure 1***. Humates are classified according to molecular weight, carbon and oxygen content and degree of solubility at various pH levels, among other things. Each component has a specific function.

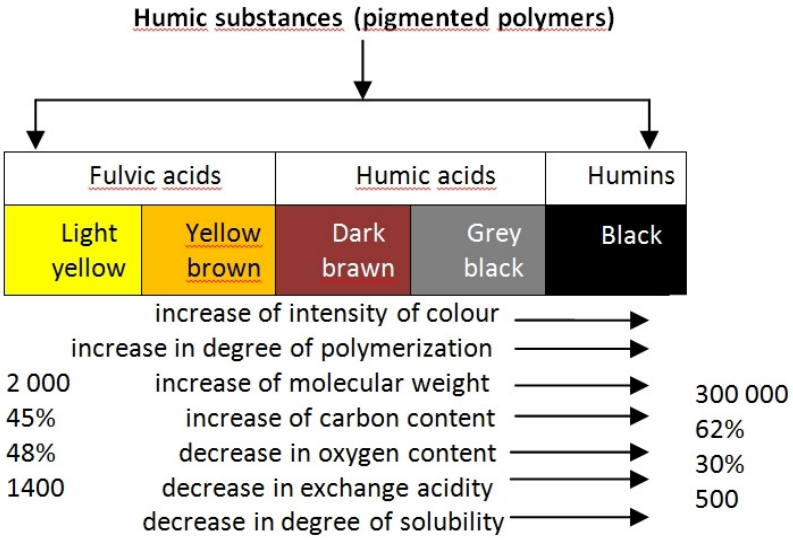
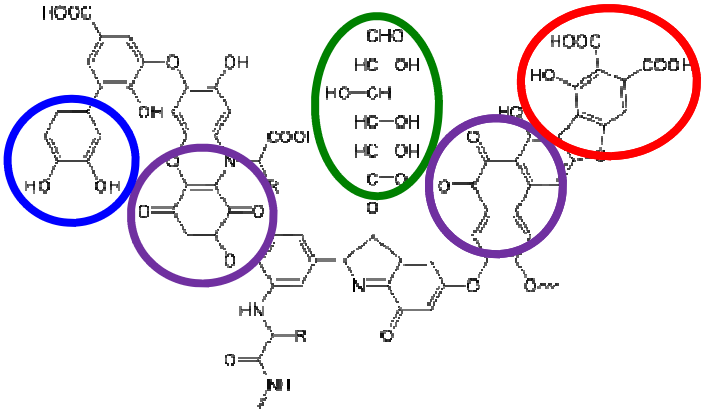


Figure 1

The humin and humic acid components of humates are high molecular weight substances that are black, gray-black and dark brown. Humin and humic acid chemically modify the structure of soil or water, which supports healthy soil and water ecology and prepares nutrients for delivery into organic life forms. Chemical modification, as shown in ***Figure 2*****,** binds minerals, amino acids, amino sugars, peptides and other nutrients for transport through the plant cell wall. This process is necessary to get soil-bound or water-bound solid nutrients into the plant in dissolved liquid form, which in turn supports the metabolism of the animal or the human consuming the plant. The high molecular weight of humin and humic acid, as well as their insolubility at acid pH prevents humins and humic acids from passing through the plant cell membrane. Humins and humic acids, therefore, do their work outside the plant and, by default, outside the human cell. However, in a process that can perhaps be compared to a smaller spaceship detaching from the mothership, the low molecular weight fraction of humates, called the fulvic acid group, acts as a conduit, not only transporting the chemically bound nutrients



Example of a typical **humic acid**, having a variety of components,
including **quinone**, **phenol**, catechol and sugar moietie

Figure 2

through plant and human cell membranes into plant and animal cells, but participating as an integral part of the process. It is the fulvic acid group, soluble at all pH levels and light yellow to yellowish brown in color that is the "gold" for both plant and human cells. It is the fulvic acid group of humates maintained in the plant that stimulates plant growth and activates a plant's secondary metabolism to increase CO2 uptake, generate energy and support photosynthesis**.** ***Fulvic acid passed through the plant or the animal that ate the plant has the same biologic activity inside the human cell. Fulvic acid maintained inside the human cell stimulates growth and repair and supports energy production. Fulvic acid is an essential nutrient.***

Besides having the lowest molecular weight, fulvic acid also has the highest oxygen content, the lowest carbon content and numerous chemically active sites, including many –COOH (carboxyl groups) and –OH (hydroxyl groups) (***Figure 3***)**,** making it uniquely suited to a wide variety of functions in the human cell. Fundamentally, fulvic acid is a natural organic electrolyte, a substance that is soluble in water and capable of conducting an electrical current. It is the proper creation and maintenance of electricity, supported by electrolytes conducting electricity that maintains physical and energetic well being in all life. Adequate amounts of electricity are especially critical during overwhelming physical, mental and emotional stress, uncontrolled infections, unbalanced diet, traumatic injury, surgical illness and prolonged loss of sleep. ***During all types of physiologic stress, human cell needs for fulvic acid increase. This makes adequate amounts of fulvic acid essential for life in the 21st century.***

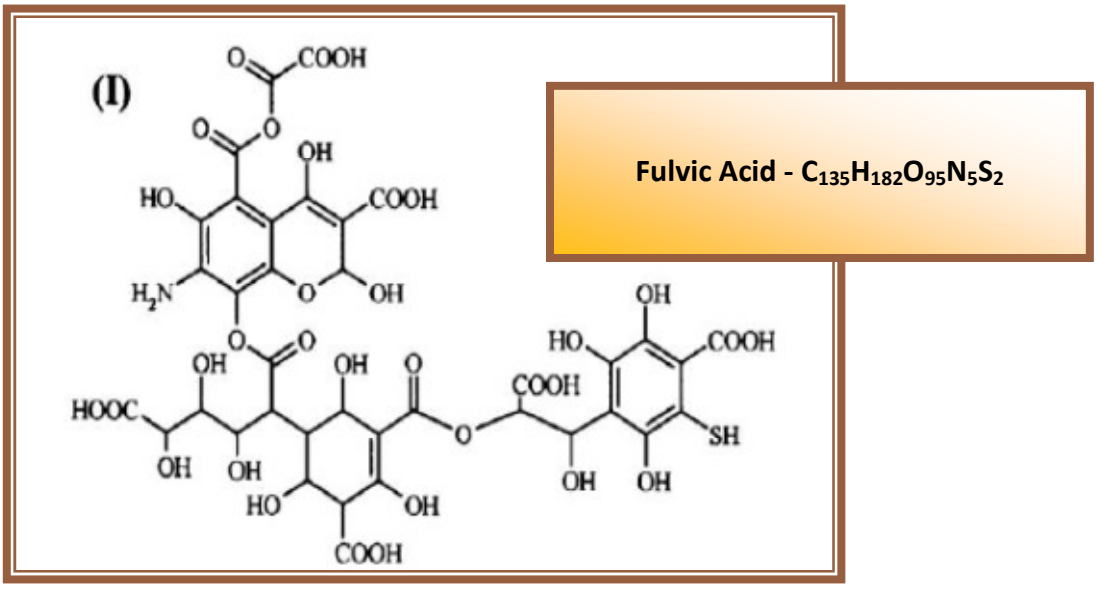


Figure 3

As an electrolyte, fulvic acid enhances the flow of electricity, thereby improving everything about human cellular metabolism. Because of its very low mineral salt content, the fulvic acid fraction supports electrical flow, with minimal corrosion. The more smoothly electricity flows and the more efficiently electricity is conducted, without arcing, without circuit interruption and with minimal corrosion, the better the cells function. ***Electrical circuitry in the human body is not maintained without fulvic acid. Without electricity, cells rupture and disintegrate***. When electricity is restored by applying fulvic acid to cells that have disintegrated, cells restructure and resume normal activity.

Enhancing electrical flow and supporting electrical efficiency is the major power in fulvic acid. Enhancing electricity increases the availability of all nutrients, including dietary proteins, carbohydrates, fats, vitamins and minerals. Enhancing electricity allows oxygen to be more readily absorbed and supports both oxidation and reduction reactions, making fulvic acid by far the most important free radical scavenger. Fulvic acid functions as either an electron donor or an electron receptor, the very definition of oxidation and reduction. Electron exchange is critical to building functions, recycling functions and waste disposal functions of the human cell. No "antioxidant" supplement is capable of both oxidation and reduction functions. Supporting only the reduction side leaves unprocessed metabolic waste inside the cell, in the blood, in the lymphatic system, and all other body fluids. Unprocessed metabolic waste is solid particle waste which, in the presence of the heat of cellular metabolism, hardens inside the body, disrupts blood and nutrient flow to the cells and is the seed crystal of all dis-ease.

Fulvic acid provides the chemical structure on which vitamins and minerals dissolve into water and then contributes to the electrical conditions by which these nutrients are passed through the cell membrane. Fulvic acid increases the efficiency of protein metabolism, enhances enzyme reactions, supports pH balance and enhances cell growth and repair. Fulvic acid allows minerals to be recycled and prolongs the residence time of essential nutrients in metabolic pathways, thereby reducing ongoing needs for mineral supplementation. Fulvic acid enhances the capability of the immune system for better anti-microbial, anti-viral and anti-fungal defense.

Last, but certainly not least, is the ability of fulvic acid to bind organic pollutants such as pesticides, herbicides and other petrochemicals, chelate heavy metals and detoxify radionuclides, also known as radioactive minerals or radioactive isotopes. Fulvic acid is capable of reacting with all radioactive metal and organic pollutant elements to form stable, detoxified chelated organo-metal complexes, preventing them from being absorbed into either the plant or the human cell. ***Fulvic acid is nature's chelating agent and does so in a way that chemically modifies the structure of toxic substances, rendering the toxic substance harmless and leaving the nutrient minerals available to either the plant or the animal or the human.***

All life is interconnected and interdependent through the energy that sustains it and the minerals, proteins, carbohydrates and fats that keep it running. Nutrient supply starts in water or soil and circulates through plant, animal and human life and returns again to the soil and water from which it came in a continuous circle of life. What flows through and supports energy and nutrient exchange along the entire circuit are complex polymers called humates. The fulvic acid fraction of humates is what electrifies and energizes plant cell and human cells, similar to how a battery holds an electrical charge that is transmitted through a spark plug to start and keep an engine running. For generations however, plants being consumed have been deficient in fulvic acid, which has compromised the health of human beings and the entire planetary ecosystem. Civilizations through the ages have been wiped out as humic and fulvic acid levels were reduced to levels no longer capable of sustaining crop production.

For natural restoration of fulvic acid, the soil has to be uncultivated for 3-5 years and for upwards of twenty years for humin and humic substances. Modern commercial and organic farming practices are most certainly not meeting these conditions. Most importantly, the soil or water must be teeming with microorganisms. Pesticide use, chemical fertilizer, soil erosion and poor agricultural practice have sterilized the soil, such that even though minerals and nutrients are being recycled, there are not enough microorganisms on the hair roots of the plants to make

adequate amounts of humin and humic acid to prepare adequate amounts of nutrients for fulvic acid to deliver to plant and human cells. Water treatment removes fulvic acid from drinking water. Commercial and organic farmers are generally not amending the soil with humates, which in and of themselves are capable of bringing microorganisms back to life, similar to how restoring electricity allows a cell to regenerate.

The good news is that word is spreading and agricultural and human supplement practices are changing. Slowly but surely, farmers and gardeners looking to optimize crop yields and healthcare practitioners and individuals looking to optimize health are being educated by scientists who have dedicated their life's work to this subject. The bad news is that the science is so complex, only a handful of companies in the world have the expertise to produce humates for soil enrichment and human consumption. There is also a lot of confusion, especially for human supplementation, thinking it is the minerals bound to fulvic acid that are important, when it is the fulvic acid alone serving the highest and best use. The power of fulvic acid as an electrolyte and chelating agent is reduced when it is bound to minerals. In addition, vitamins and minerals are most bioavailable having passed through plant or animal biochemistry. This is especially true of iron, which must be converted to heme by the ruminant animal. Without heme iron, all the red organs of the human body, including the liver, the kidneys, the spleen, the thyroid and the bone marrow are compromised.

It is also extremely important to understand that alkaline extracted products, which contain both humic and fulvic substances, contain heavy metals. Humic substances do not discriminate. Humic substances support all life. They therefore bind heavy metals and light minerals, both of which play an integral part in plant and microbial metabolism. Human cells mostly run minerals with an anatomic number less than 50, the "light minerals". Consuming a product with heavy metals is not in the best interests of a human cell, which has no use for them, and cannot eliminate them without outside help and/or the support of fulvic acid. Heavy metals prevent human cell nourishment.

The safest product for human consumption is pure fulvic acid. ***Pure fulvic acid contains no heavy metals, no hydrocarbons, no radionuclides and no organochemicals. The fulvic acid group can only be made using a natural acid extraction process and must be consumed at an acid pH. When a product is black or black-grey or dark brown, and/or alkaline extracted or perhaps acid extracted from humate salts and yellow, the product contains humins and humic acid and should be avoided.***

The science gets very confusing, but the bottom line is this: To be optimally health in the 21st century, supplementation with pure fulvic acid is required, because fulvic acid has been

depleted in the food chain for a very long time. Fulvic acid is necessary for normal electrical function inside the human cell. Cells thrive with fulvic acid. Fulvic acid supports growth and repair of hair, skin, nails as well as all cells in the body. Fulvic acid supports a strong immune system, a strong organ system and an optimally healthy body. Fulvic acid is nature's chelating agent, neutralizing heavy metals, organophosphates, petrochemicals and radioactive minerals in a safe and effective way. Fulvic acid is required to bring all nutrients into the body. Without adequate fulvic acid, human cellular metabolism is compromised. Without fulvic acid, herbal supplementation, vitamin supplementation and especially mineral supplementation is dangerous. Why? Because without fulvic acid as the conduit, supplements are not fully processed, becoming metabolic trash in the blood, the nervous system, the lypmphatic system and inside the cells themselves! Without adequate amounts of fulvic acid, vitamin, mineral and herbal supplementation cause electrical circuits to overload, short out and eventually break. Initially, electrical overload from supplementation may feel better, especially for a person with little or no energy. This feeling is short lived as long term overload of electrical circuits prevents human cells from generating and maintaining power and energy on their own. Supplements are just that: supplements. They are no substitute for maintaining the fundamental principles on which life operates. And when life is supported from the ground up, aided by fulvic acid, very little supplementation is required.

Power generated from within the cell is the sustaining life force, not power coming from outside the cell feeding to feeding, craving to craving or fix to fix. Food energy has to be converted on a continuous basis to cell power, which requires fulvic acid and metabolic enzymes. Power inside the cell is generated according to the laws of electricity, similar to how a light bulb will light in water that contains dissolved mineral salts. Meeting needs for energy, vis-a-vis electrical balance, is the key to generating and maintaining power for optimal health. Fulvic acid plays a major role in energy balance and electrical balance inside the human body. Consider fulvic acid supplementation. Seek guidance and clarification as necessary to navigate the world of science on which the human body runs.

For further information about fulvic acid supplementation,
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