

# Activated Water

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## Abstract:

*This particular article relates to subtle electrical effects, and provides some evidence of a fundamental nature on how electromagnetic fields might be utilized to modify the molecular arrangements and activity of water. I have focused my efforts on the water molecule to show that it can be activated both for physical processes and for influences on cellular life structures.*

*Activated Water is produced with the help of patented, non-chemical Molecular Resonance Effect Technology. The process of water activation induces the formation of water molecular clusters similar to water molecular structures found in living cells.*

*The basic idea of Molecular Resonance Effect Technology is the direct transmission of prerecorded molecular activity signals to biological systems with the help of Activated Water. These messages are imprinted in water during the process of activation. The effect of Activated Water on molecular complexes, such as bacteria, viruses, and abnormal cells, can be explained by the fundamental physical phenomenon of electromagnetism, such as resonance, constructive and destructive interference.*

*“The molecular structure of water is the essence of all life.”*

Albert Szent Gyorgyi, recipient of Nobel Prize for discovery of vitamin C.

*“Water profoundly influences all molecular interactions in biological systems. The existence of life depends critically on the capacity of water to dissolve polar molecules that serve as ... information carriers.”*

Lubert Stryer, Stanford University, Author of Biochemistry 4th Ed., 1995.

## Molecular Resonance Effect Technology

After researching the effects of electromagnetic radiation on cellular structures at St. Petersburg University in Russia, I developed a system called Molecular Resonance Effect Technology (MRET). I also created a device for the

alteration of the molecular organization state of water and other liquid substances. For this invention I was awarded a US patent in February 2000. It is US Patent # 6,022,479 – “*Method and Device for Producing Activated Liquids and Method of Use Thereof*”.

There are lots of types of purified waters such as spring, distilled, colloidal, and nanoclustered waters. But no process has previously been known which can alter the molecular structure of water without any foreign substances being introduced into the water. My invention relies on the idea that electromagnetic radiation can effect the atomic and molecular structures of substances. This fact was proved by specific class of experiments involving Rydberg atoms—atoms with an electron in a highly extended orbital (“*Rydberg Atoms—Giants of the Atomic World*” by F. Barry Dunning in *Science Spectra* issue 3, pp. 34-38, 1995).

The effect an electromagnetic force has on an atom depends on the atom's electronic structure during the interaction. One could imagine that the application of the appropriate time-dependent force to an atom could alter its electronic structure in a specific way, thereby controlling its response to subsequent radiative or collisional processes. Furthermore, the specificity of certain reactions of electronic structure might be exploited to reconstruct the motion of the atomic electron cloud. The key to the manipulation of electronic structure in atoms is the generation of electromagnetic fields or radiation that will push and pull the electronic wave function in a controlled and reproducible way. (“*Modifying Atomic Architecture*” by Robert R. Jones in *Science Spectra* Issue 22, pp. 52-59, 2000).

The water molecule has a polar triangle structure with covalent bonding of two hydrogen atoms to one oxygen atom. There is a measured 104.5 angle between these bonds. Water is one of the most polar molecules known in

nature. The polarity of water underlines its chemistry and thus the chemistry of life. Polar molecules interact with one another through attraction. This weak attraction is called a hydrogen bond. In regular water polar molecules form short-range, unstable associations of different crystal shapes. In this way, water is able to form liquid crystal associations that have only 5 to 10% of the strength of covalent bonds. According to my hypothesis, the process of water activation induces the formation of long-range water molecular domains similar to water molecular structures found in living cells.

The water-activating device used in Molecular Resonance Effect Technology is made of a polar polymer compound with long linear molecular structure ( $nM-----Mn$ , where  $n>38$ ) mixed with certain amounts of pharmacologically active organic and inorganic substances. Most polar polymers possess comparatively high values of relative permittivity (*dielectric constant*). This means that external electromagnetic forces can easily displace both bonding and non-bonding electrons in the molecular structure of these polymers.

In the activating process, the polymer compound is placed in an external electromagnetic field with specific MRET power and frequency. The field consists of subtle, low frequencies similar to healthy geomagnetic frequencies found in specific areas on Earth (*for example some areas in the Caucasian Mountains in Europe or the Tibetan Mountains in Asia*). The naturally occurring water in these areas has been proved through hundreds of generations to enhance health, support rejuvenation and longevity, and help eliminate heavy metals and other toxins and allergens from living organisms.

The applied electromagnetic field excites the molecular structure of the polymer-activating compound. This, in turn amplifies the Corona Discharge Effect, which is the physical process of

cold emission of electrons. The result of this amplification is an emission of subtle low frequency electromagnetic oscillations originated by the polymer itself.

During the MRET process, the water being activated is affected by defined patterns of specific, beneficial, low frequency electromagnetic oscillations emitted by the activating device. I believe that the process of activation alters the configuration of the water molecules and strengthens the hydrogen-bonding patterns. As a result, the water molecular organization state is changed, resulting in the formation of long-range water molecular domains.

Both Nuclear Magnetic Resonance and High-Voltage Photography tests have confirmed changes in the molecular structure of the water molecules of Activated Water. Dr. Lin Chiang conducted the NMR test at NuMega Resonance Laboratory. The test showed a consistent 2.5 times increase in the width of the proton pick in the line of NMR absorption for all types of Activated Water (Fig. 1). According to Nuclear Magnetic Resonance Theory there is a synonymous correlation between the form of the line of NMR absorption in the homogeneous magnetic field and the characteristics of molecular motions and dispersion in the liquids being tested. Thus, the increase of proton pick width and proton dispersion could occur only as a result of alteration in the shape and organization of water molecules in Activated Water.

High-Voltage photographs showed that Activated Water demonstrated an enhanced amount of the Corona Discharge Effect – luminous fringes that appear around electrically conductive samples of water (Fig. 2). The physical process of cold emission of electrons produces the Corona Discharge phenomenon. Thus, the emission of electrons in Activated Water is more intensive. It is reasonable to assume that proton activity in all types of Activated Water is also increased. No foreign substances were introduced to the water during the activation process. Therefore, the enhanced Corona Discharge Effect could occur only as a result of structural changes in Activated Water.

The benefits of Activated Water have been confirmed by extensive experimental work. Tests on Activated Water show the effect of balancing the pH and decreasing the hardness of water (Fig. 3),

increasing electrical conductivity and turbidity (Fig. 4), significant reduction of bacterial counts (Fig. 5). These results may be in part because free radicals, such as H<sup>+</sup>, OH<sup>-</sup>, Ca<sup>2+</sup> and Mg<sup>2+</sup>, will bond with long-range Activated Water structures that contain stronger hydrogen bonds, rather than short-range structures in regular water.

Lori Motil, RM and CLS conducted these tests at CAI Environmental Laboratory:

- The 15 minutes activation of alkaline water sample changed pH from 7.69 to 7.48, which means the 30% reduction of alkalinity (*the pH index difference from pH0=7.0*). The 30 minutes activation showed the 62% reduction of alkalinity; pH changed from 7.65 to 7.25. The 30 minutes activation of acid water sample changed pH from 6.73 to 6.89 that means the 60% reduction of acidity. It is significant that these tests showed the tendency of activation process to balance the pH index to pH0=7.0, reducing both acidity and alkalinity. It may happen because the free radicals of H<sup>+</sup> and OH<sup>-</sup> in Activated Water are bonding with long-range water structures that have stronger hydrogen bonds than short-range structures in regular water.
- In the water activated for 30 minutes the amount of Calcium decreased by 72%, Magnesium decreased by 18%. As a result the hardness of the water (*combined amount of Calcium and Magnesium*) decreased by 45%. Thus this test showed significant decline of free radicals in Activated Water. It may happen because the free radicals of Ca<sup>2+</sup> and Mg<sup>2+</sup> are bonding with long-range Activated Water structures that have stronger hydrogen bonds.
- Conductivity of water increased by 3% and turbidity by 18% within 30 minutes of activation. These results confirm the idea that the process of activation creates long-range molecular structures in water. The free radicals are bonding with Activated Water molecular structures and form sediment that increases turbidity of water.
- The microbiology test showed the

86% decrease of total and fecal coliforms in the rainwater activated for 30 minutes. The heterotrophic plate count test showed the 44% decrease of bacterial colonies in the lake water activated for 15 minutes. Thus the suppression of harmful microorganisms by Activated Water was confirmed. These tests proved the sterilization effect of the process of water activation.

Tests on the biological effects of Activated Water showed in vitro suppression of cancer cells (Fig. 6), significant enhancement of White Blood Cells Counts during chemotherapy (Fig. 7), accelerated plant growth (Fig. 8), and immediate improvement in cellular conductivity, resistance and capacitance in human subjects.

- Dr. John Stelle conducted in vitro tests on Lymphoma cells at the Laboratory of Engene Biotechnologies Inc. The mutated cells were incubated with Activated Water and with herbal supplement Herbalix, based on Activated Water, for 24 hours. These tests consistently showed that Activated Water suppressed the metabolism of 33% of human cancer cells (BUC), 50% of dog cancer cells (*Lymphoma 1308*), and 10% of cat cancer cells (*FL74*). Herbalix suppressed the metabolism of 45% of human cancer cells, 30% of dog cancer cells and 50% of cat cancer cells. The results on human and dog cancer cells were statistically valid with p>0.99. The survival level of cancer cells in control groups remained 100%. Tests also showed that Activated Water is nontoxic. This fact creates a lot of advantages comparing to chemotherapy agents that fight cancer cells but at the same time suppress metabolism of normal cells. A general consensus is that the survival level of tumor and normal cells incubated with chemotherapeutic agents is less than 5%.
- Extremely valuable is the rebounding effect of Activated Water and Herbalix on the White Blood Cells Counts (WBCC) during chemotherapy. The research was based on the results of blood tests

of the volunteer, a patient of Cedar-Sinai Comprehensive Cancer Center in Los Angeles with metastasized naso-pharyngeal cancer. He was taking Activated Water and Herbalix while going through his regular chemotherapy treatments (*Taxotere chemotherapy*) in September of 1998, October of 1998, March of 1999 and April of 1999 respectively. On the sixth-seventh day after chemotherapy the WBCC usually decrease from the normal range of 4.00-10.81000/U to the extremely low range of 0.1-0.21000/U (2%-3% of their pre-chemotherapy level). The rebounding period takes about six to eight weeks. The ingestion of Activated Water and Herbalix prevented the decrease of WBCC to their lowest levels and helped them to regain the pre-chemotherapy level in unusually short period of time. In this particular case WBCC dropped to the level of 0.5-0.61000/U (5%-9% of their pre-chemotherapy level) and rebounded to the normal level in two-three days. The results were statistically valid with  $p > 0.95$ . Thus, the ingestion of Activated Water and Herbalix compensates one of the major side effects of chemotherapy treatment—the dramatic long-term decrease of WBCC, as well as general weakness, headache, nausea, etc.

- Another test was conducted on plants. This test was designed to compare the 15 days growth cycle of two groups of soybeans (20 beans in each group) irrigated with Activated and regular water from the same source. By the end of this test the group of beans irrigated with Activated Water had 13 sprouts with the average length of 9". The control group of beans irrigated with regular water had only 7 sprouts with the average length of 4". This test clearly confirmed the fact of significant enhancement and acceleration of growth of plants irrigated with Activated Water.
- Mr. Robert Fogli has tested the effects of Activated Water on human subjects in Healthway Inc. with a help of FDA approved Bioelectrical Impedance instru-

mentation. This device measures the changes in cellular conductivity, resistance, and capacitance. These tests showed that Activated Water creates an immediate improvement in cells functions. For example, the consumption of only 6 ounces of Activated Water within 20 minutes showed that water was moving from outside the cells to inside, that capacitance (*cell energy storage*) enhanced dramatically, and that water outside the cells was leaving the body. It proved that edema (*water retention*) was reduced and cells functions improved within only 20 minutes.

Molecular Resonance Effect Technology affects liquid substances other than water in a similar way, by changing their molecular organization. For example, polyurethane polymerized with the help of MRET dramatically changed its physical properties and became a porous, high-surface-area material, which was more flexible than the original polyurethane. Also tests on cement made with Activated Water showed changes in compressive strength and total load capabilities.

### Electromagnetism in Biological Systems

It is a scientifically based fact that water plays the most important role in the vital activity of living systems, since they contain about ten thousand molecules of water per one molecule of protein. The human body, for example, is up to 75% water. Water molecules participate in cell communications and in principal metabolic functions. The basic idea of Molecular Resonance Effect Theory is the direct transmission of pre-recorded molecular activity signals to biological systems with the help of Activated Water. These messages are imprinted in water during the process of activation.

The latest physical and biological concepts support the theory of cell communication through the transmission of electromagnetic signals (*discovered by Russian scientist Alexander Gurvich in 1920's and scientifically proved by two American scientists Gilman and Rodbell. They were awarded a Noble Prize for this research in 1994*). Molecular signals are composed of low

frequency waves (*less than 20kHz according to the experimental work of Dr. J. Benveniste, France*) that induce cellular function and interaction. Living cells can resonate only with low frequency electromagnetic oscillations, since for millions of years of evolution they developed their normal metabolism being exposed to natural Earth geomagnetic field characterized with the spectrum of low frequency oscillations in the range of 0.5-15Hz. Living cells resonate in the range of 0.3-13Hz, and human brain function waves (*Delta, Theta, Alfa*) are in the range of 0.3-30Hz.

During the process of activation water is affected by defined patterns of low frequency electromagnetic oscillations. They are generated by polar polymer compound in the range of healthy geomagnetic frequencies found in specific areas on Earth. The oscillations generated by specifically designed polar polymer compounds modify molecular structures in water and make Activated Water very beneficial for living cells. This concept is based on the possibility of the existence of resonance phenomenon between polar polymers and biopolymers such as proteins, nucleic acids, lipids, etc. The resonance effect between polar and biopolymers rely on the similarity of their long linear molecular structures and elements content. The lengths of polar polymers and biopolymers molecular structures are around 0.3-3.0 angstroms. Biopolymers as well as polar polymers are composed of such elements as carbon, oxygen, nitrogen, hydrogen, phosphorus, etc.

Quantum electrodynamics calls for the existence of long-range electromagnetic fields that can be transmitted by large coherent domains existing in water (*E. Del Giudice and E. Preparata, Journal of Biological Physics, vol. 20, p. 105, 1994*). These long-range electromagnetic fields may transmit electromagnetic signals from molecules, thus generating specific attraction between molecules with matching spectra, excluding non-resonating, unwanted random events. Thus, specific low frequency patterns generated by defined polar polymer compounds can be transmitted to living systems with the help of Activated Water. They can support and improve cellular functions in the body.

The effect of Activated Water on molecular complexes, such as bacteria,

viruses, and abnormal cells, can be explained by the fundamental physical phenomenon of electromagnetism, such as resonance, constructive and destructive interference. When long-range electromagnetic fields transmitted by the molecular clusters of Activated Water interact with normal cells, they create a resonance effect that enhances the biochemical reactions in these cells. But when Activated Water electromagnetic fields interact with the abnormal fields generated by the DNA of mutated cells, destructive interference is generated which suppresses the biochemical reactions in these cells.

Same mechanism can be adopted for other molecular complexes such as viruses, bacteria, etc.

The ongoing advances suggest radically new strategy to counteract the diseases caused by fault signaling in cells, such as cancer, cerebral palsy, diabetes, hepatitis C, immune system disorders, bacterial and viruses spread and reproduction. Microbiology tests, Sensitivity of Tumor Cells to Activated Water tests, Rebounding Effect of Activated Water on WBCC test, Plant Growth test on Soybeans, and Bioelectrical Impedance test evidently show that Activated Water carries and transmits the life sustaining information to cellular structures.

The theory of structured or domain organization and interaction of cellular water is a general consensus in contemporary scientific world. In compliance with his experimental work Dr. Ling suggested the pattern of long-range water organization in cellular systems. It includes complex multilayered water organization and long-range hydrogen bonding. Dr. Drost-Hansen, Dr. Watterson, Dr. Rorschach and Dr. Clegg confirmed that cellular water is organized into interactive domains and different liquid crystal associations traveling as a stationary wave through the medium. Based on this theory the phenomena of existence of cellular resonance was predicted in 1980 by Dr. Frohlich and confirmed later by Dr. Webb by means of laser spectroscopy.

Living organisms can use in the cell building process directly only properly molecular organized water that is similar to structured water in biosystems. Therefore, Activated Water may be easy absorbed by living systems. As a result, this water facilitates, accelerates, and enhances the process of cell building.

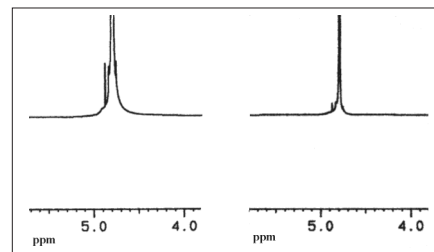
Bioelectrical Impedance and Plant Growth tests confirm this fact. Other forms of water, such as water with unbounded molecules or various types of water with short-range flickering hydrogen bonds, are not bioavailable to living systems. Living organisms have to metabolize (*to structure*) the water at great physiological cost.

The recent studies prove that the aging process and the increase of fat content contribute to the decline of water content in the body. The average 45 year-old man has about 65%-70% of water in the body, but an obese man of the same age will have only about 45%, and the water content of the average man by age 70 decreases to 45%-50%. With a help of magnetic resonance imaging instrumentation Japanese scientists also found out that aging results not only in dehydration, but that intercellular water undergoes significant structural changes—the amount of biowater bound to biological macromolecules increases and the amount of “free” structured water decreases. As a result the cells communication, nutrient delivery, detoxification, oxygenation and other biological functions based on the dynamic activities of biowater decline with age. The process of transduction of bioelectrical signals into biochemical reactions also declines causing in its turn the break down of cells repair and replication system and the metabolic efficiency of the body. The hydration of the body tissues with Activated Water helps to improve the functions of cellular systems, to restore the metabolic efficiency and to support the process of rejuvenation.

At the conclusion, I would like to underline that Activated Water has outstanding physiological and physical properties. It is a result of changes in the configuration of molecules, stronger hydrogen bonding and long-range water molecular structures in Activated Water. The living organisms don't have to spend a lot of energy to assimilate and metabolized this water. Thus, all organs and tissues in the body receive the plentiful supply of structured water that enhances and stimulate their homeostasis. Various types of Activated Water are transducting to the body beneficial energy and information specified to eliminate a number of problems and to improve the health conditions.

## TEST RESULTS

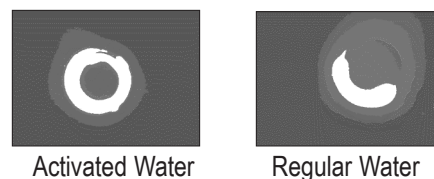
### Nuclear Magnetic Resonance Test



Activated Water Regular Water

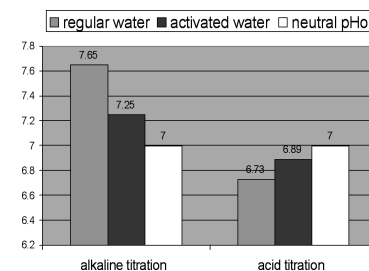
**Figure 1.** The width of the proton pick in regular water is 0.1ppm and in all three types of Activated water it is 0.25ppm. It means a consistent 2.5 times increase in the width of the proton pick in Activated Water. The increase of proton pick width could occur only as a result of alteration in the shape and organization of water molecules in Activated Water. The water sample was activated for 30 minutes.

### High-Voltage Photography Test

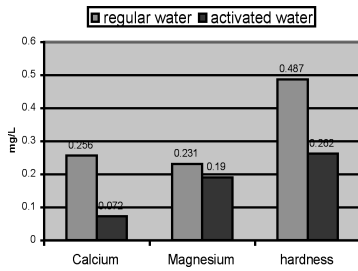


**Figure 2.** Activated Water demonstrated an enhanced amount of the Corona Discharge Effect - luminous fringes that appear around electrically conductive samples of water. The physical process of cold emission of electrons produces the Corona Discharge phenomenon. Thus, the emission of electrons in Activated Water is more intensive. It could occur only as a result of structural changes in Activated Water. The water sample was activated for 30 minutes.

### The pH Test

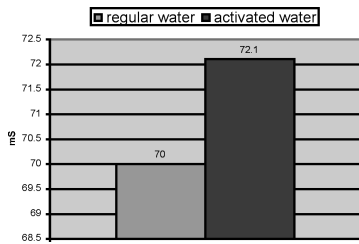


### Hardness (combined Ca and Mg)

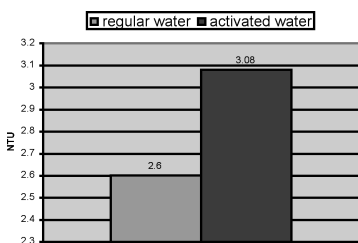


**Figure 3.** The pH test shows the tendency of Activated water to balance pH index to pH=7, reducing both alkalinity and acidity. The hardness test shows significant reduction of Ca and Mg in Activated water. Thus these tests support the idea that free radicals (H<sup>+</sup>, OH<sup>-</sup>, Ca<sup>2+</sup> and Mg<sup>2+</sup>) bond with long-range Activated Water molecular structures that contain stronger hydrogen bonds, rather than short-range structures in regular water. The water sample was activated for 30 minutes.

### Conductivity

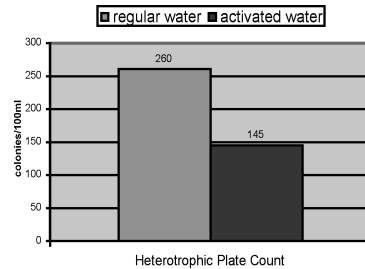
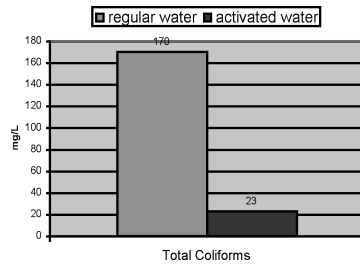


### Turbidity



**Figure 4.** The process of activation increased conductivity and turbidity of water. These results confirm the idea that the process of activation creates long-range molecular structures in water. The increase of turbidity confirms the idea that free radicals are bonding with long-range molecular structures in Activated water and form sediment. The water sample was activated for 30 minutes.

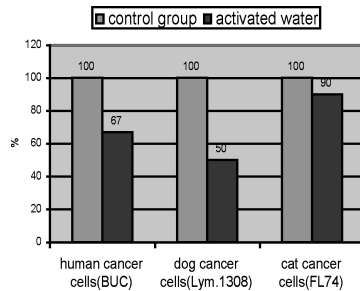
### Microbiology Tests



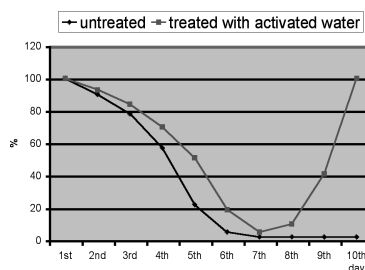
**Figure 5.** Test was conducted on samples of rain-water. The water sample was activated for 30 minutes. Test was conducted on samples of water from the lake. The water sample was activated for 15 minutes.

The amount of total coliforms and bacterial colonies significantly decreased after the process of water activation. Both tests prove the sterilization effect of the process of water activation.

### Sensitivity of Tumor Cells to Activated Water / Rebounding Effect of Activated Water on White Blood Cells Count



**Figure 6.**



**Figure 7.**

### Figures 6. and 7.

Sensitivity of tumor cells to Activated water was determined by in vitro sensitivity assay. Tumor cells were incubated with Activated water for 24 hours at concentration ranging 1:10.

Activated water inhibited tumor cell growth relative to untreated control wells.

The results on human and dog cells are statistically valid with p=0.99.

This test was conducted on a patient undergoing chemotherapy treatment. WBCC usually decrease to 2%-3% of their pre-chemotherapy level. Activated water ingestion prevented the decrease of WBCC to the lowest level and caused rebound to pre-chemotherapy level in 2-3 days (compared to 6-7 weeks usually).

The results are statistically valid with p=0.95.

### The Plant Growth Test on Soybeans

Regular Water Activated Water



1st Day

Regular Water Activated Water



15th Day

**Figure 8.** This test was designed to compare the 15 days growth cycle of two groups of soybeans (20 beans in each group) irrigated with regular water and Activated water from the same source. By the end of this test the group of soybeans irrigated with Activated water had 13 sprouts with the average length of 9". The control group of soybeans irrigated with regular water had only 7 sprouts with the average length of 4". This test has shown significant enhancement and acceleration of growth of plants irrigated with Activated water. ♦

12 REFERENCES for this article are available by faxed request to Explore! at 1-928-541-1906.