

## Activated water

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**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.**

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### MOLECULAR RESONANCE EFFECT TECHNOLOGY

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

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

*“Structured water acts as a transducer of chemical and bioelectric energy”*

Frohlich, Molecular Biologist, 1985.

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 structure of water and other liquid substances. For this invention I was awarded a USA

patent in February 2000. It is USA Patent # 6,022,479 – “Method and Device for Producing Activated Liquids and Method of Use Thereof” (Smirnov, 2000).

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 affect 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 (Dunning, 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 (Jones, 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. Untreated 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 ( $nM \text{---} \text{---} M_n$ , 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.

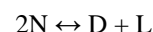
The mechanism that explains the effect of electromagnetic fields on water is related to the existence of defects in molecular structure of water. The stable structural changes in water were detected in experiments by the UV luminescence spectrophotometer. They have been attributed to different water structural defects that include specific centers of luminescence. The nuclear proton spins were considered to be a primary targets of external magnetic fields, since proton lattice of water molecules is unstable and asymmetric. The structural metastability of water was associated with microscopic orbital currents of protons in water-molecular hexagons, and deviation from the stoichiometric composition of water. The effects of memory of water interacting with electromagnetic fields were

supposed to originate from the oscillations of water-molecular hexagons.

Bernal-Fouler rules describe structural organization of hydrogen and oxygen atoms in the system of hydrogen bonds in water. According to these rules: a) each oxygen atom has covalent bonding with two hydrogen atoms; b) each hydrogen bond (O-O line) has one hydrogen atom. The dissociation of water molecules abuses Bernal-Fouler rule a), and leads to the existence of hydroxyl ions  $\text{OH}^-$  and hydronium ions  $\text{OH}_3^+$  and as a result ionic defects have place in the molecular structure of water.



There are also Bierum orientation defects existing in water molecular structure that abuse Bernal-Fouler rule b), and lead to the existence of D-defect (there are two protons on line O-O), and L-defect (there are no protons on line O-O). These defects appear as a result of disorientations of molecules in the hydrogen bonding of water.



Where N – hydrogen bonds without defects.

L-defect has negative electrical charge, and D-defect has positive electrical charge. The recombination of Bierum orientation defects has no direct correlation with ionic defects in molecular structure of water. The orientation of nuclear proton spins may influence biochemical processes in biological systems. It is a result of associations and disintegrations of mentioned above structural defects of water, since ionic structural defects are chemically active. The recombination of water defects is classified within both classical and quantum types of description. The nuclear proton spins exposed to the external resonance magnetic field are losing their dynamic correlation that leads to recombination of water defects and to deviation of stoichiometric composition of water. The recombination of water defects in magnetic field is a result of proton spin orientations that initiates the quantum transition of proton from one potential position to another potential position in the lattice of hydrogen bonding in water. In this case the potential energy of proton is characterized with ‘two position’ curve (Figure 1) (Binhi, 1998).

The probability of the quantum transition of protons depends on the interaction of the wave functions of neighboring protons that in its turn is a result of proton spin orientation. The oscillating magnetic field can influence the probability of proton quantum transitions. In theory, the probability of proton quantum transitions in the system exposed to non-resonance magnetic field can be considerable time-independent factor  $P_0$ . In the system exposed to resonance magnetic field the probability of proton quantum

transitions is time-dependent factor  $P_{(t)}$ . The mean value of the intensity of proton quantum transitions in the system exposed to resonance magnetic field differs in time from the intensity of proton quantum transitions under influence of non-resonance magnetic field. The theoretical calculation reveals the following result (Binhi, 1998):

$$(P_{(t)} - P_0) : P_0 \approx 41\%$$

It shows that nuclear proton spins in the lattice of hydrogen bonds in water can be controlled by the resonance magnetic field applied to the system.

The stable water molecular clusters were discussed based on observed low-frequency spectra of the water electric conductivity in a number of experiments. The clusters were assumed to memorize an electromagnetic activation in water molecular structure. Thermal fluctuations of the  $kT$  scale are ten orders greater than the quantum of the hydrogen bonding energy. In this case, the question is important – why do these random thermal disturbances not destroy the molecular clusters of water? A suggested solution of the problem is related to the idea of coherence of the external stimulus (resonance magnetic field), against the background of incoherent thermal noise. As a result high quality molecular oscillators, such as water-molecular hexagons, may be swung up in a time-space coherent manner to a condition when the quantum of collective excitation energy will be predominant over the energy of random thermal fluctuations (Frohlich and Kremer, 1983).

The structural changes in water that result from the influence of the external magnetic field are further transmitted to the biological level, since water takes part in a variety of metabolic reactions. One of the primary magnetobiological mechanism associates the effects of subtle magnetic fields with altered states of liquid water in biological systems.

Nuclear Magnetic Resonance test, Dispersion Staining Microscopy and High-Voltage Photography tests have confirmed changes in the molecular structure of the water molecules in Activated water.

Dr. Lin Chiang conducted the NMR test at NuMega Resonance Laboratory. Experiments were conducted in compliance with standard NMR methodology. The data were recorded on a 500 MHz Bruker AM-500 spectrometer. Signal peak was observed for all samples, indicating that the water samples are free of detectable organics. 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 (Figure 2). 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 state of water molecules in Activated Water.

Analyst Bryan Burnett conducted Dispersion Staining Microscopy tests according to standard methodology at Meixa Tech Laboratories. The six water samples (3 control and 3 activated from the same source) were frozen with the help of liquid Nitrogen injection, and then analyzed in polarized light. Crystals diffract light depending on structure, thickness, and orientation to the incident light. When the source of light is polarized, the light emerging from the crystal will be broken down into restricted wavelengths (colors). To complete the imaging process, a second polarizer, that is cross-oriented to the first polarizer, is placed between the crystal sample and the camera. Dispersion Staining tests (Figure 13) did show differences in this experiment:

The crystalline structure of the frozen regular tap water, compared to the activated tap water showed extensive fracturing and chaotic crystalline formation. This is likely due to the impurities and poor organized molecular structure in the tap water, which interfere with crystallization process.

Activated water samples showed well organized crystalline formations with a strong tendency of crystal axis to be oriented in one direction. This is likely a result of domain molecular organization state of activated water. In this experiment Activated water generated crystals that appear typical hexagonal crystalline structure of ice. This fact also illustrates that Activated water has fewer impurities after treatment than control tap water samples.

High-Voltage photographs were taken by Polaroid camera according to standard HVP methodology. High-Voltage photographs showed that Activated Water demonstrates an enhanced amount of the Corona Discharge Effect - luminous fringes that appear around electrically conductive samples of water (Figure 3). 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 means that the energy level of water molecules is higher. 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

Smirnov, I.

hardness of water (Figure 4), increasing electrical conductivity and turbidity (Figure 5), significant reduction of bacterial counts (Figure 6). These results may be in part because free radicals, such as  $H^+$ ,  $OH^-$ ,  $Ca^{2+}$  and  $Mg^{2+}$ , 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. Samples of Activated water and regular water from the same sources were analyzed utilizing EPA or other ELPA approved methodologies:

The 15 min 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  $pH_0=7.0$ ). The 30 min activation showed the 62% reduction of alkalinity; pH changed from 7.65 to 7.25. The 30 min activation of acid water sample changed pH from 6.73 to 6.89 that mean the 60% reduction of acidity. It is significant that these tests showed the tendency of activation process to balance the pH index to  $pH_0=7.0$ , reducing both acidity and alkalinity. It may happen because the free radicals of  $H^+$  and  $OH^-$  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 min 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  $Ca^{2+}$  and  $Mg^{2+}$  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 min 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 coli forms in the rainwater activated for 30 min. The heterotrophic plate count test showed the 44% decrease of bacterial colonies in the lake water activated for 15 min. 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 (Figure 7), significant enhancement of White Blood Cells Counts during chemotherapy (Figure 8), accelerated plant growth (Figure 9 and Figure 10), resistance to deprivation stress applied to

plants (Figure 14), 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 hrs. Sensitivity of the tumor cells to therapeutic agents (Activated water and Herbalix) was determined by an in vitro sensitivity assay. The tumor cells were separated to a single-cell suspension by passage through a wire mesh, resuspended and washed in RPMI 1640, 20% fetal calf serum media and distributed at 105 cells per well in 96-well plates. Cells were incubated with Activated water and Herbalix to be tested at concentrations ranging from 1:10 to 1:1280 for 18 hrs at 37°C and 8%  $CO_2$ . At the end of the incubation period the imaging dye MTT (Thiazolyl Blue) was added, and the cells were incubated a further 6 hrs. Cells were lysed with 1% sodium dodecyl sulphate 5% acetic acid solution and the absorbance read at 700 nm. Percentage inhibition of cell growth caused by Activated water or Herbalix was calculated relative to untreated control wells. 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 (4 chemotherapy courses) 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 rebounding effect was 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. It is a result of better absorption and higher energy level of Activated Water, and the suppression of the mold in Activated Water.

Onions irrigated with Activated Water show enhanced and accelerated growth of roots and sprouts. It is a result of enhanced absorption and higher energy level of Activated Water that improves biochemical reactions in living systems.

The deprivation test was designed to compare the results of irrigation of plants (Tomato and Parsley) with regular tap water (control group) and Activated tap water (testing group). The test were designed as follows: plants were seeded indoors under the room temperature and irrigated for five weeks with regular tap water and Activated tap water respectively. Then the irrigation of plants in both groups was stopped for one week. The photographs of both groups of plants were made after one week of deprivation. They clearly demonstrate that plants irrigated with Activated water developed much better resistance to deprivation stress than plants irrigated with regular 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 instrumentation. This device measures the changes in cellular conductivity, resistance, and capacitance. Bio-electrical Impedance Analysis (BIA) is a direct measure of dynamic fluid and tissue volumes. The changes in tissue and fluid volumes are expressed as systematic changes in the results such as the dynamics of Intra and Extra – cellular water (ICW/ECW) exchange. The BIA test is performed by placing four small electrodes to the hand and foot, while the patient lays flat. The RJL BIA Analyzer is connected to the electrodes and measures the patient's electrical impedance value called resistance. The electrical current is carried through the body

by the water in tissues, blood, etc. The more water in the body tissues, the easier it is for the current to travel from the hand to the foot, and the lower the resistance. The less water, the higher the resistance. 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 min 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 min.

Molecular Resonance Effect Technology affects liquid substances other than water in a similar way, by changing their molecular organization. A lot of food products on the market including milk contain preservatives. They make more difficult the processes of fermentation and food assimilation, and as a result slow down metabolism. For instance, holistically oriented Medical Doctors do not recommend drinking the processed milk available on the market at all, because the body practically can't absorb it. The process of activation changes the structure of milk. It prevents the harmful effect of preservatives and induces the process of fermentation. In Activated processed milk fermentation started on the 4<sup>th</sup> day and in regular processed milk it did not start at all. As a result, the process of activation makes easier the absorption of milk, and enhances and accelerates metabolism. Activated milk did not start molding till the 9<sup>th</sup> day of the test. By that time regular milk was totally covered with mold and has strong rotten smell. This test proves that the activation process accelerates and enhances fermentation and prevents rotting ([Figure 11](#)). As a result it improves assimilation of nutrients in the body.

Polyurethane is made with the help of polymerization process from two liquid parts: resin and hardener. Polyurethane activated during the polymerization dramatically changed its physical properties and became a porous, high-surface-area material, more flexible than the regular polyurethane ([Figure 12](#)). Also tests on cement made with Activated Water showed changes in compressive strength and total load capabilities.

## ELECTROMAGNETISM IN BIOLOGICAL SYSTEMS

*"Signal transduction is a whole new world of biochemical interactions that control cell behavior."*

David Baltimore, Nobel Laureate and Molecular Biologist.

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. It is the liquid portion of the blood and the fluid both inside and outside each cell. Water is also an important structural component of skin, cartilage and other tissues and organs. It is the medium in which the principle metabolic functions take place. It is essential for carrying nutrients, electrolytes and hormones throughout the body, and removal of waste from cells.

Water molecules participate in cell communications and in principal metabolic functions. The basic idea of Molecular Resonance Effect Theory 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. Activated Water is produced from pure, clean water that has undergone a transformation of its molecular structure into organized activated state, closely resembling the cellular water. It is energized water capable of optimizing all physiological functions and carrying health-imparting messages throughout the body.

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 20 kHz 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 0.5-15 Hz. Living cells resonate in the range of 0.3-13 Hz, and human brain function waves (Delta, Theta, Alfa) are in the range of 0.3-30 Hz.

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 (Del Giudice and Preparata, 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, Deprivation test on plants, 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 easily 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 metabolically restructure the water before it is bioavailable to the body. Such restructuring is accomplished with 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 absorb and metabolize this water. Thus, all organs and tissues in the body receive the plentiful supply of structured water that enhances and stimulate their homeostasis. Organized Activated Water is the medium of communication among the cells – communication that takes place by signal transduction, which is the translation and transfer of information from one form to another form. For example, electromagnetic signals into biochemical signals. 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.

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## APPENDIX

### Figures

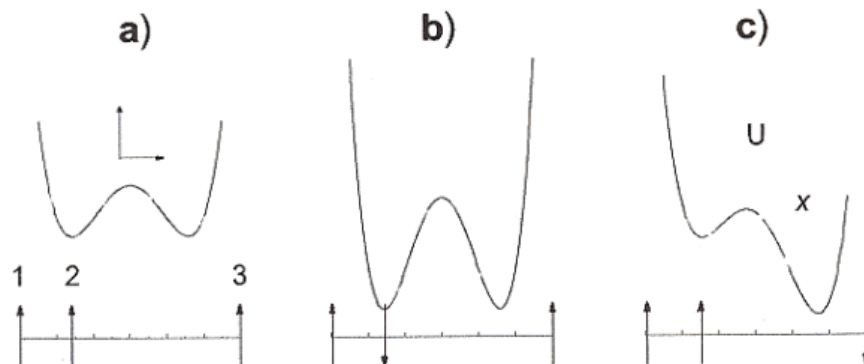


Figure 1. The variation of potential positions of proton as a result of different nuclear proton spins orientations.

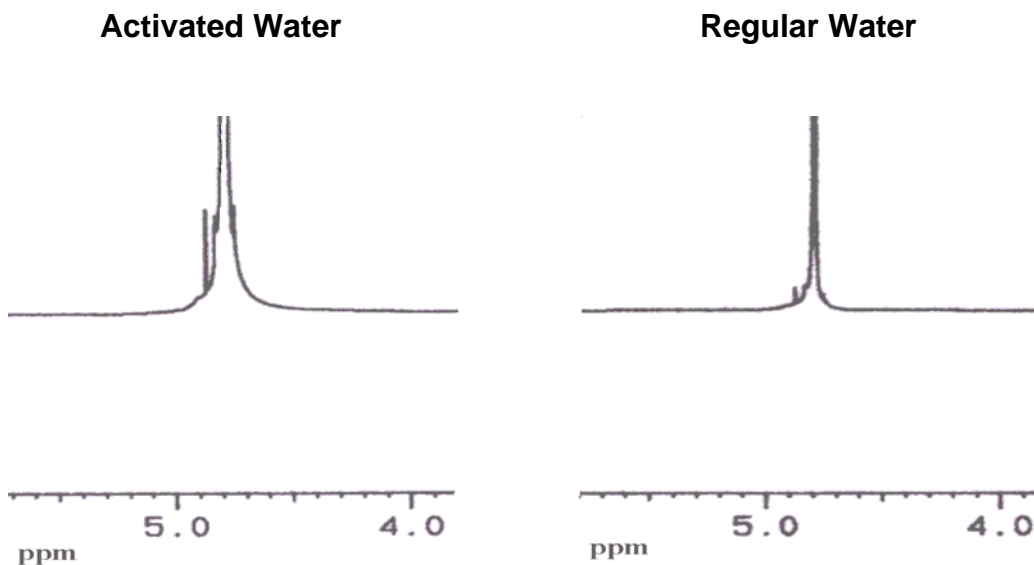


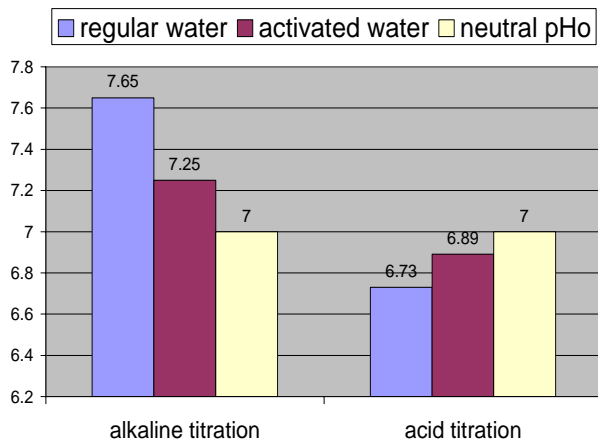
Figure 2. Nuclear magnetic resonance test. The width of the proton pick in regular water is 0.1 ppm and in all three types of Activated Water it is 0.25 ppm. It means a consistent 2.5 times increase in the width of the proton pick in Activated Water. The increase of proton pick width could occur only as a result of alteration in the shape and organization of water molecules in Activated Water. The water sample was activated for 30 min.



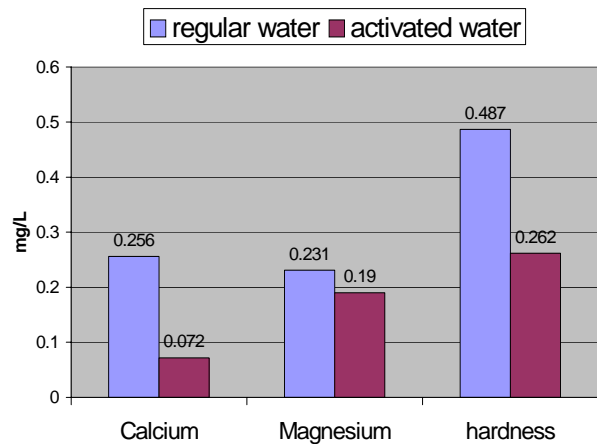


**Figure 2. High-voltage photography test.** Activated Water demonstrated an enhanced amount of the Corona Discharge Effect - luminous fringes that appear around electrically conductive samples of water. The physical process of cold emission of electrons produces the Corona Discharge phenomenon. Thus, 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 min.

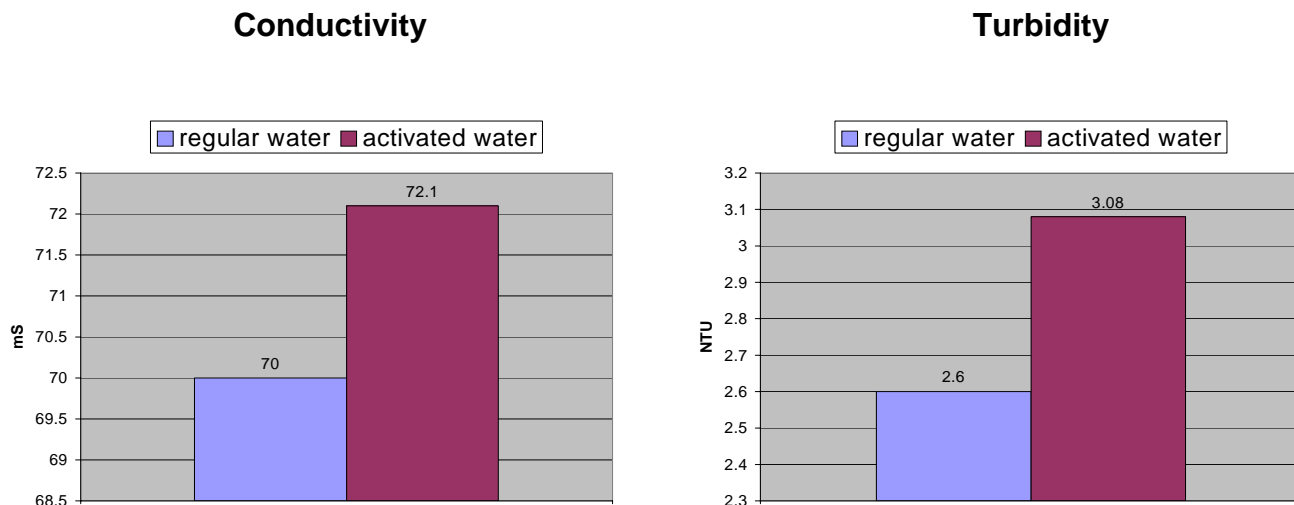
### The pH TEST



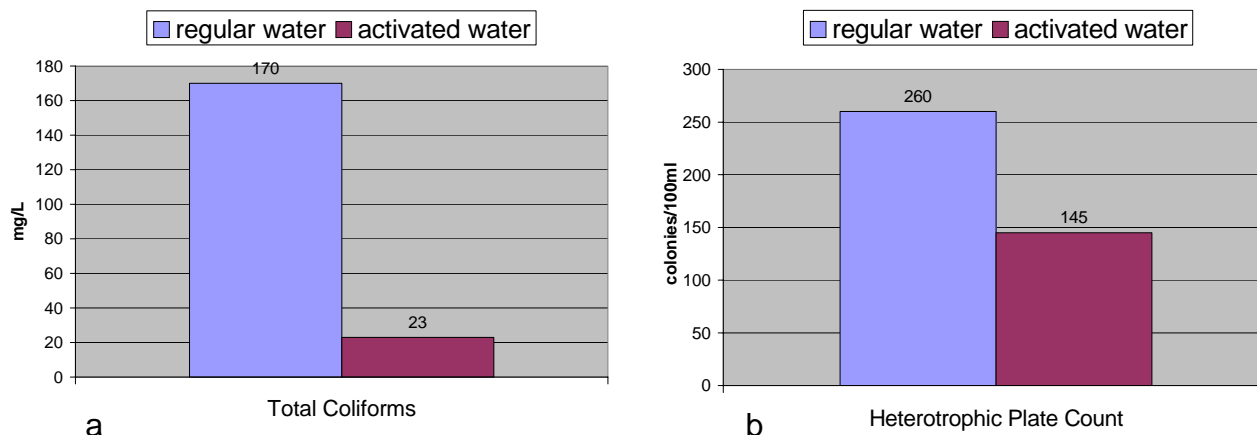
### Hardness (combined Ca and Mg)



**Figure 4.** The pH test shows the tendency of Activated Water to balance pH index to pHo=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 ( $H^+$ ,  $OH^-$ ,  $Ca^{2+}$  and  $Mg^{2+}$ ) 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 min.

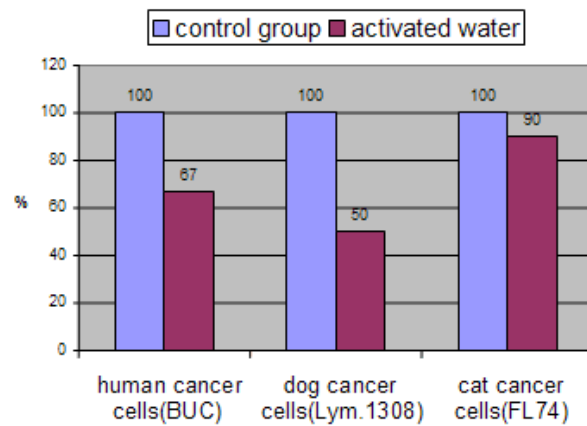


**Figure 5.** The process of activation increased conductivity and turbidity of water. These results confirm the idea that the process of activation creates long-range molecular structures in water. The increase of turbidity confirms the idea that free radicals are bonding with long-range molecular structures in Activated Water and form sediment. The water sample was activated for 30 minutes.

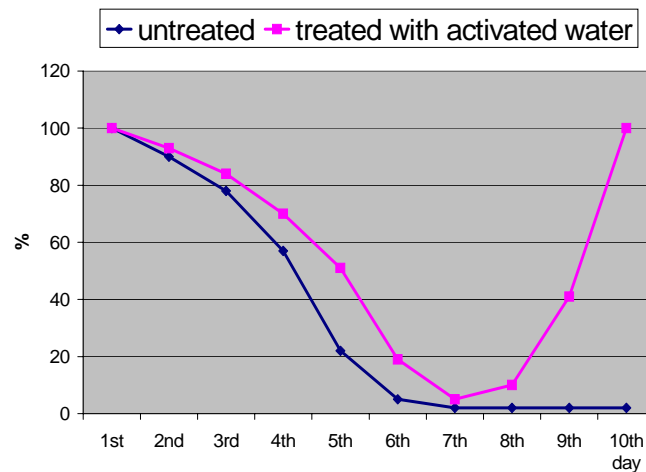


**Figure 6. Microbiology tests.** The amount of total coliforms and bacterial colonies significantly decreased after the process of water activation. Both tests prove the sterilization effect of the process of water activation.

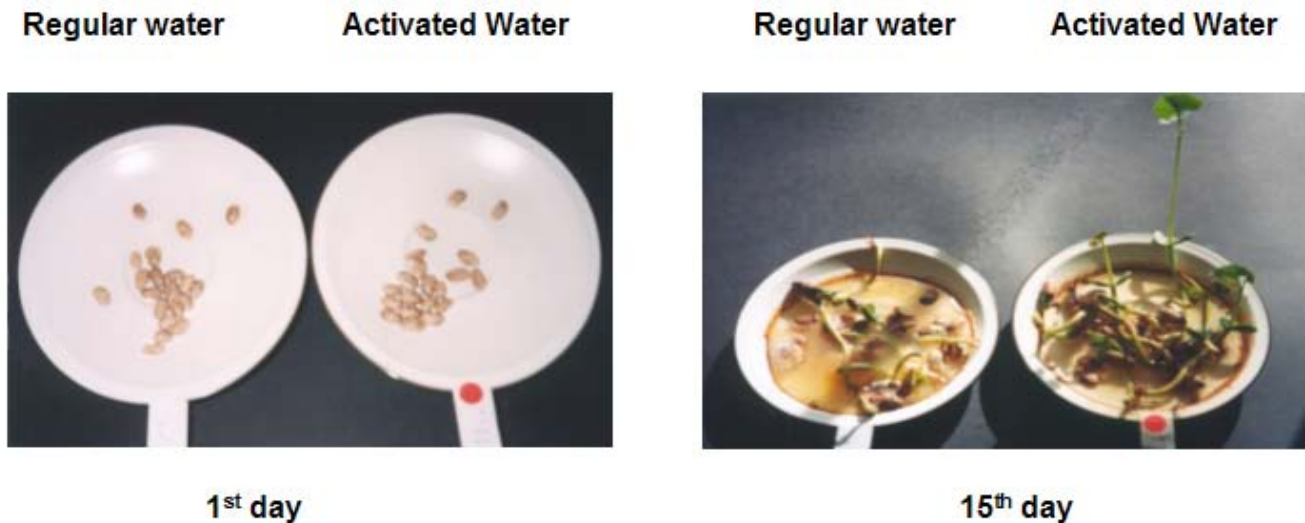
- a) Test was conducted on samples of rainwater. The water sample was activated for 30 min.
- b) Test was conducted on samples of water from the lake. The water sample was activated for 15 min.



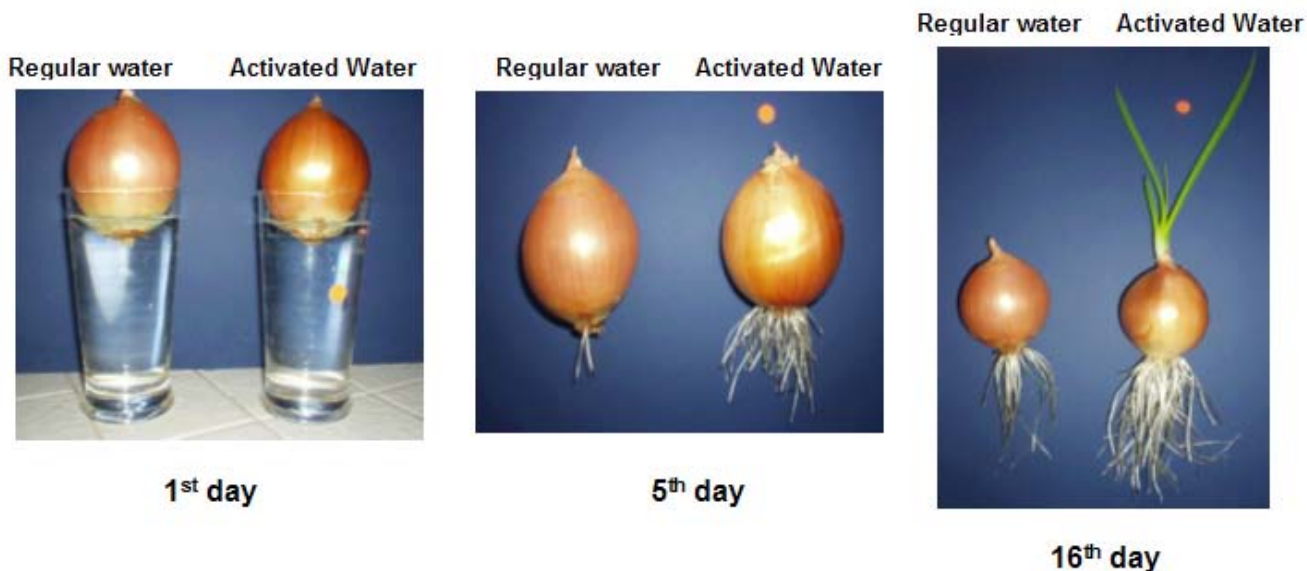
**Figure 7. Sensitivity of tumour cells to activated water.** This was determined by in vitro sensitivity assay. Tumour cells were incubated with Activated Water for 24 hours at concentration ranging 1:10. Activated Water inhibited tumour cell growth relative to untreated control wells. The results on human and dog cells are statistically valid with  $p=0.99$ .



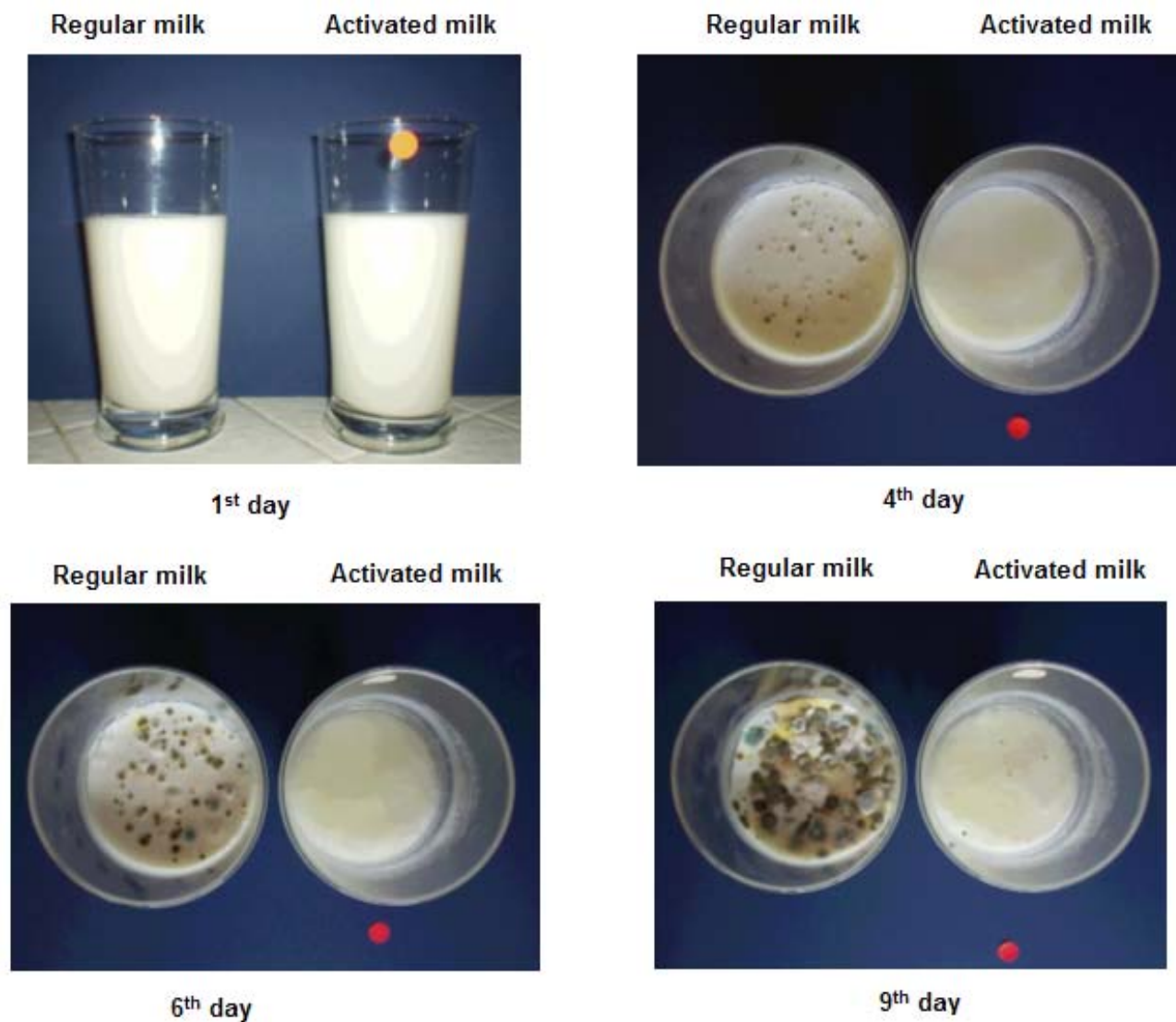
**Figure 8. Rebounding effect of activated water on white blood cells counts.** This test was conducted on a patient undergoing chemotherapy treatment. WBCC usually decrease to 2%-3% of their pre-chemotherapy level. **Activated Water** ingestion prevented the decrease of WBCC to the lowest level and caused rebound to pre-chemotherapy level in 2-3 days (compared to 6-7 weeks usually). The results are statistically valid with  $p=0.95$ .



**Figure 9. The plant growth test on soybeans.** 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. It is a result of better absorption of Activated Water by plants and the suppression of the mold in Activated Water.



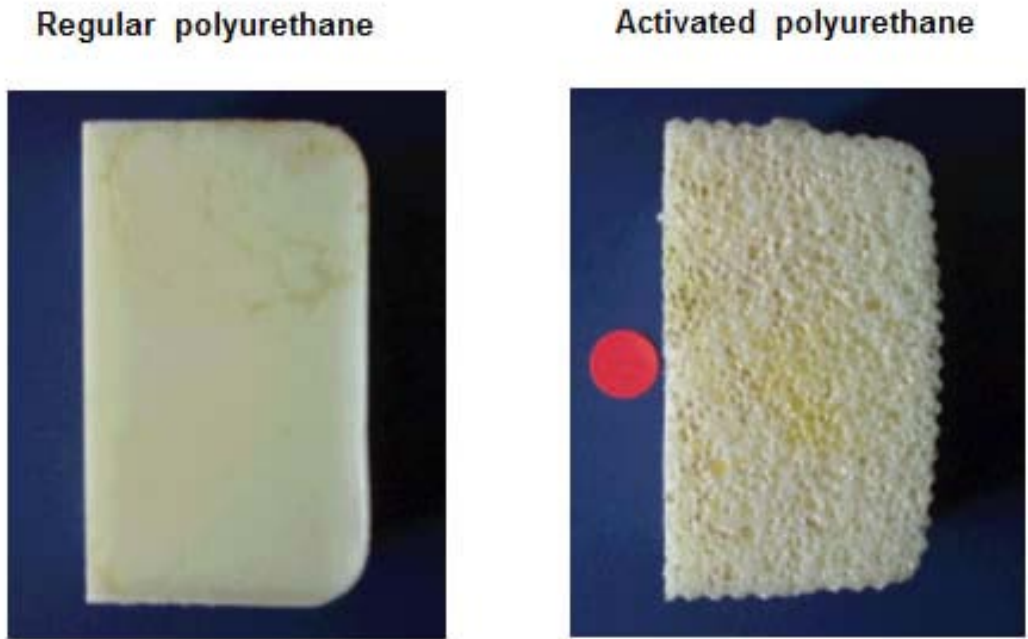
**Figure 10. Plant growth test on onions.** The onion irrigated with Activated Water shows enhanced and accelerated growth of roots and sprouts. It is a result of enhanced absorption of Activated Water that improves biochemical reactions in living systems.



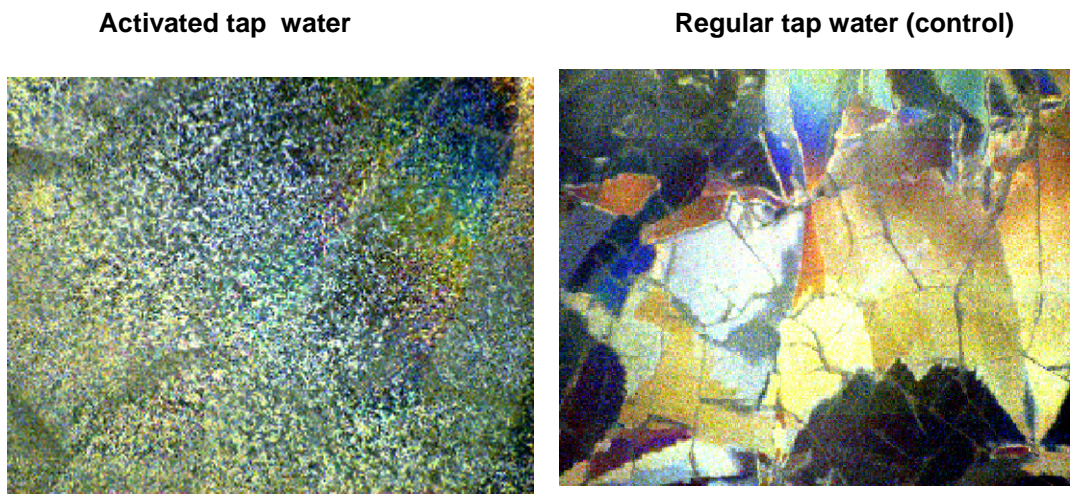
**Figure 11. The effect of activation process on milk.** Molecular Resonance Effect Technology affects liquid substances other than water in a similar way, by changing their molecular organization. A lot of food products on the market including milk contain preservatives. They make more difficult the processes of fermentation and food assimilation, and as a result slow down metabolism. For instance, holistically oriented Medical Doctors do not recommend drinking the processed milk available on the market at all, because the body practically can't absorb it.

The process of activation changes the structure of milk. It prevents the harmful effect of preservatives and induces the process of fermentation. In Activated processed milk fermentation started on the 4<sup>th</sup> day and in regular processed milk it did not start at all. As a result, the process of activation makes easier the absorption of milk, and enhances and accelerates metabolism. Activated milk did not start moulding till the 9<sup>th</sup> day of the test. By that time regular milk was totally covered with mould and has strong rotten smell. This test proves that the activation process accelerates and enhances fermentation and prevents rotting. As a result it improves assimilation of nutrients in the body.





**Figure 12. The effect of activation process on plastics.** Polyurethane is made with the help of polymerisation process from two liquid parts: resin and hardener. Polyurethane activated during the polymerisation dramatically changed its physical properties and became a porous, high-surface-area material, more flexible than the regular polyurethane. This test proves that activation process changes molecular structure of liquid substance other than water.



Images of the crystalline structures in frozen water samples

**Figure 13. Dispersion staining microscopy.** The crystalline structure of the frozen tap water shows extensive fracturing and chaotic crystalline formation. This is likely to the impurities and poor organized molecular structures in the tap water which interfere with crystallization process. Activated water sample shows well organized crystalline formations with a strong tendency of crystal axis to be oriented in one direction. This is likely a result of domain molecular structure of Activated water.



## Start seeds indoors



Activated water

Regular water



Activated water

Regular water

## After one week of deprivation test



Activated water

Regular water



Activated water

Regular water

**Figure 14. Deprivation test on plants (Tomato and Parsley).** These tests were designed to find out the effects of irrigation of seeds of Tomato and Parsley plants with regular tap water (control group) and after activation of tap water with MRET device (testing group). These tests were designed as follows: plants were seeded indoors under the room temperature and irrigated within five weeks with regular tap water and activated tap water respectively. Then the irrigation of plants in both groups was stopped for one week. The photographs of testing and control groups made after one week of deprivation test clearly demonstrate that plants irrigated with activated water developed better resistance to deprivation stress than plants irrigated with regular water.