



**ALL KANGEN**

**MADE EASY BUNDLE**

by Anick Martinez

Electrolyzed reduced water

# **MEDICAL RESEARCH**



# TABLE OF CONTENTS

02	Introduction
05	Water in Our Body
07	Chlorinated Water
08	Molecular Hydrogen
12	Acid-Alkaline Balance & Athletic Performance
13	Cancer
14	Diabetes
15	Digestive Health
17	Neuroprotective
18	Rheumatoid Arthritis
19	Effect on DNA
20	Live Blood Analysis
22	Other Physiological Functions
24	References

# INTRODUCTION

## MUST READ

---

This e-book will dive into some of the scientific literature on ERW related to health, illness, and disease. However, it is **CRUCIAL** to note that it is strictly **FORBIDDEN to use this information as marketing material.**

Enagic policies and compliance regulations are very strict, and, as a distributor, you have agreed to follow them rigorously. **It is forbidden for distributors to market on ANY health benefits of Kangen Water**, especially on social media. We cannot talk about any health benefit, only about Kangen Water properties:

- Alkaline
- Antioxidant
- Restructured

These are the only things Enagic allows us to market about (health-wise); **not any health benefit, only water properties.**

**My purpose by creating this e-book is to inform and educate you**, distributor, on the incredible findings on ERW. When I came across all this information during my research, I was blown away! I now have a deep passion for sharing Kangen Water because I understand its potential. Because **I know how it may help people on a deeper level, even though I cannot tell them.** I genuinely believe in all this research that I am about to share.

I want this knowledge to be for YOU distributor, not for your leads and potential clients. I want you to truly feel the potential of ERW so you can share it with passion. People actually buy from the person, not so much the product itself. If you can fully embody this passion for Kangen Water, you will be able to share it effortlessly. People will feel your passion and will want to buy from YOU.

## Important things to keep in mind when reading these studies:

- I don't want to overwhelm you with pages of information, so I will simply quote the **most relevant studies**, link them and write a conclusion if needed.
- **The properties of your ERW (alkalinity, H2 concentration, ORP, etc.) will entirely depend on the mineral content of your source water, flow rate, water temperature, state of your machine, and more.**
- **Different studies use different types of ERW** with varying levels of pH, different ORP, some used ERW with NaOH which might be similar to Strong Alkaline Water, some are *in vitro* studies - meaning they were done in a petri dish instead of a living organism (in vivo) - and many others were done on mice. **There are A LOT of factors to take into account when analyzing these studies.** It doesn't necessarily mean that by drinking ERW you will get the same results found in vivo, in vitro, or on mice...

Although, I do believe ERW holds great power, especially if consumed fresh and over long periods of time. But please remember that **most of these studies don't consist of "drinking Kangen Water", it is ERW, yes, but many different factors come into play...**

### **ERW is also termed:**

Alkaline electrolyzed water, alkali-ionic water, alkaline cathodic water, alkaline ionized water, and hydrogen-rich water (HRW), based on its physicochemical and physiological aspects.

Now, let's dive into the research!

## **DISCLAIMER**

Statements within this book have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease. You should always ask your doctor before using any products.

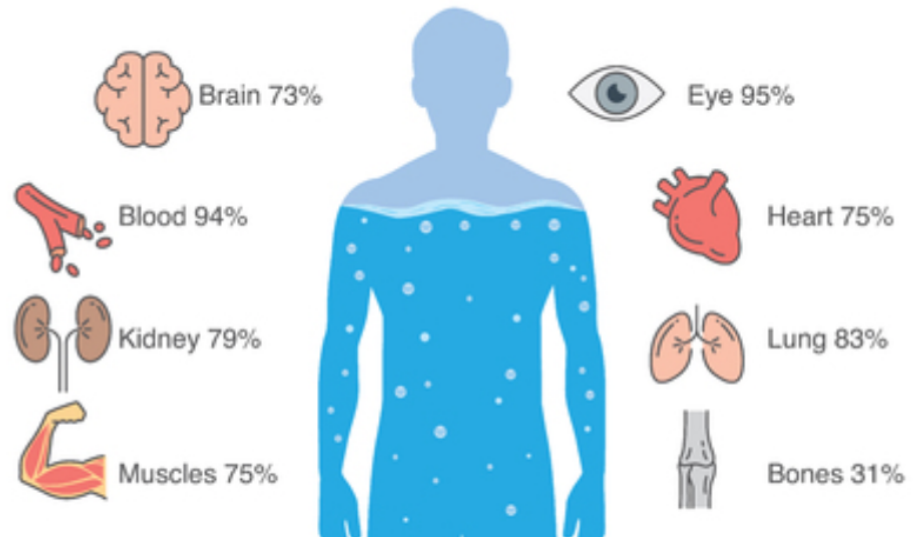
# WATER IN OUR BODY

**Water has enormous healing potential for the human mind, body, and spirit.**

It has been known to help cure illness, refresh the body, and relax the mind for thousands of years. As the cheapest and most abundant resource on this planet, water should still be used for its ability to soothe and heal.

Water can **store information and take different shapes** according to what it is exposed to. **Our water quality affects all of our cells at a molecular level.**

## WATER IN CERTAIN ORGAN AND BODY PART



**Our body is 60 to 70% water!** It is only evident that water plays a central role in our health. The more water we lose, the more our cells deteriorate.

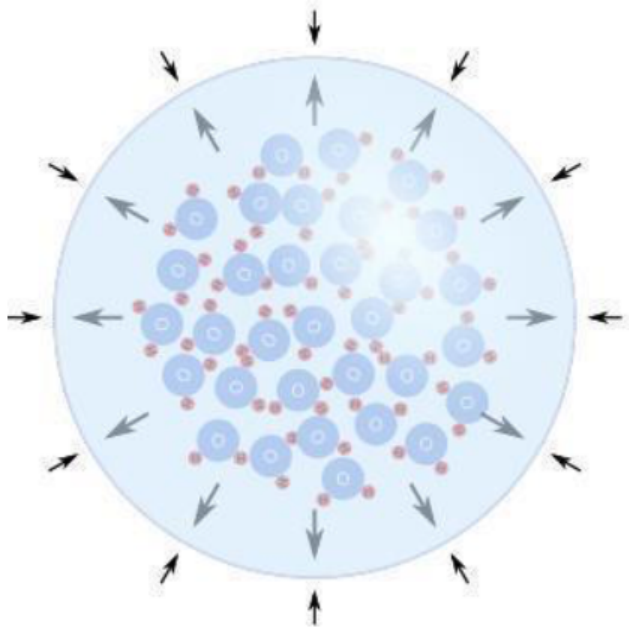
## WATER AT THE MOLECULAR LEVEL

- A vital nutrient to the life of every cell
- Primary building material
- Regulates our internal body temperature by sweating and respiration
- The carbohydrates and proteins that our bodies use as food are metabolized and transported by water in the bloodstream
- Assists in flushing waste mainly through urination
- Acts as a shock absorber for brain, spinal cord, and fetus
- Forms saliva
- Lubricates joints
- Encapsulates our DNA



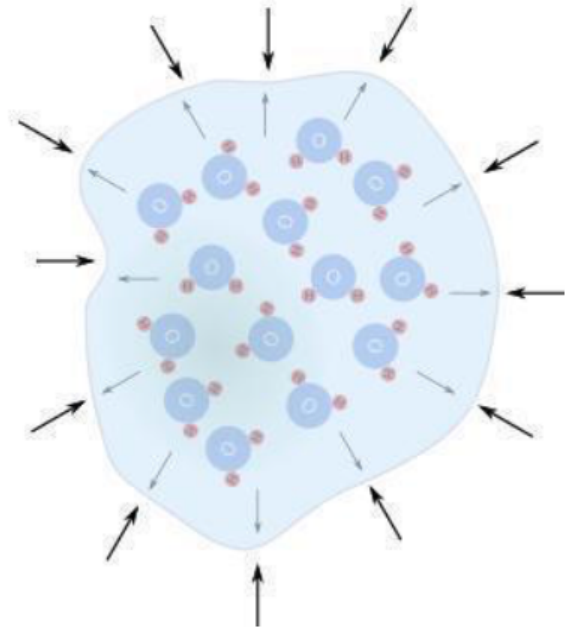
## Hydrated cell

Pressure inside > outside



## Dehydrated cell

Pressure outside > inside



## SUPPORTS CELLULAR STRUCTURE

Water also has an **essential structural role** in biology. Water fills cells to help maintain their shape and structure. The water inside many cells creates pressure that opposes external forces, similar to putting air in a balloon. **Water allows everything inside cells to have the right shape at the molecular level.** As the form is critical for biochemical processes, this is also one of water's most important roles. *Geometry/form is information. Information for Life.*

Water is an abundant resource that should be studied and advanced for the sake of modern medicine and healing. For the future health of humanity, water is a beautiful tool against ailments of the body, mind, and spirit.

Refer to the e-book *Quantum Physics, the Power of Intention and Water* for a more profound outlook on water and its healing power.

# CHLORINATED WATER

“While drinking water disinfection has effectively prevented waterborne diseases, an unintended consequence is the generation of disinfection byproducts (DBPs). Epidemiological studies have consistently observed an **association between consumption of chlorinated drinking water with an increased risk of bladder cancer.**”

(Xing-Fang Li and William A. Mitch, 2018)

“In spite of chlorine importance in the water disinfection and decrease the pathogens in the water, **chlorine gas is fatal even if it is at concentrations as low and has an important role in the occurrence of several diseases** through its participant in the **deficiency of immunity, cancer, and Abnormalities.**”

(Harjan, I., et al., 2019)

“These results suggest that **organic byproducts of chlorination are the chemicals of greatest concern** in the assessment of the **carcinogenic potential** of chlorinated drinking water.” (J. Dunnick, et al., 1993)

Negative Health Effects of Chlorine, by Joseph G. Hattersley

“This meta-analysis of the best available epidemiological evidence indicates that **long-term consumption of chlorinated drinking water is associated with bladder cancer**, particularly in men. The observed relative risk is only moderately high, but the population attributable risk could be important as the vast majority of the population of industrialised countries is potentially exposed to chlorination byproducts for long time periods.” (Villanueva, C. M., 2013)



# MOLECULAR HYDROGEN

**Molecular hydrogen is the primary therapeutic component of ERW.** Since molecular hydrogen was first reported as a free radical scavenger in 2007, **its beneficial effects have been documented in more than 170 disease models and human diseases** (2019). These diseases share the overproduction of reactive oxygen species (ROS) - free radicals - where molecular hydrogen has been widely demonstrated as a **selective antioxidant**.

“To date, H<sub>2</sub> preventive and therapeutic effects have been observed in various organs, including the brain, heart, pancreas, lung, and liver. **H<sub>2</sub> mediates oxidative stress and may exhibit anti-inflammatory and anti-apoptotic effects.** (...) **The exact molecular mechanisms of the effects of low-dose H<sub>2</sub> remain unclear.**”

- H<sub>2</sub> penetrates biomembranes and effectively reaches cell nuclei.
- H<sub>2</sub> selectively scavenges hydroxyl radical ( $\cdot\text{OH}$ ) and peroxynitrite (ONOO<sup>-</sup>)
- and thus prevents DNA damage.
- H<sub>2</sub> also downregulates the expression of pro-inflammatory and inflammatory cytokines, and pro-apoptotic factors.
- H<sub>2</sub> upregulates the expression of anti-apoptotic factors.
- H<sub>2</sub> modulates signal transduction within and between many pathways.
- The exact targets and molecular mechanisms of H<sub>2</sub> are unknown.”

([Li Ge et al., 2017](#))

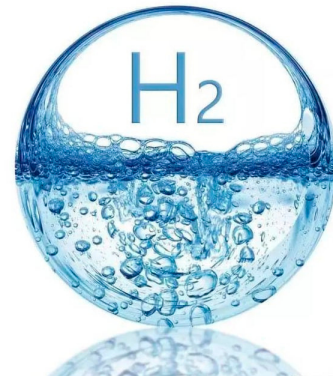
# SELECTIVE ANTIOXIDANT

**“H<sub>2</sub> is a specific scavenger of hydroxyl radical OH· and peroxynitrite ONOO-, which are potent oxidants** that react indiscriminately with nucleic acids, lipids, and proteins, resulting in DNA fragmentation, lipid peroxidation, and protein inactivation. Fortunately, H<sub>2</sub> does not appear to react with other ROS that has normal physiological functions in vivo. **H<sub>2</sub> administration decreases expression of various oxidative stress markers (...).”**

([Li Ge et al., 2017](#))

**“It has been shown the antioxidant and cytoprotective properties of hydrogen gas or dissolved in aqueous solutions** in several experimental models (e.g. Alzheimer, Parkinson, hypersensitivity reactions, transplant rejection, and damage to liver, intestine, lung, heart, and neurons) and in patients with diabetes and metabolic syndrome.”

([Pérez-Hernández EG, 2011](#)).



**“H<sub>2</sub> diminished oxidative stress in** patients with diabetes mellitus, potential metabolic syndrome, hemodialysis, and peritoneal dialysis, cancer patients receiving radiotherapy, patients with mitochondrial and inflammatory myopathies, rheumatoid arthritis, and chronic hepatitis B.”

([Sergej M., 2015](#))

**“H<sub>2</sub> has a number of advantages as a potential antioxidant:** H<sub>2</sub> rapidly diffuses into tissues and cells, and it is mild enough neither to disturb metabolic redox reactions nor to affect reactive oxygen species (ROS) that function in cell signaling, thereby, there should be little adverse effects of consuming H<sub>2</sub>.”

([Ohta, Shigeo, 2011](#))

# ANTI-INFLAMMATION

“H2 has exhibited anti-inflammatory activities in various injury models. Typically, **H2 inhibits oxidative stress-induced inflammatory tissue injury** via downregulation of pro-inflammatory and inflammatory cytokines.”

([Li Ge et al., 2017](#))

“Molecular hydrogen affected acute and chronic inflammation biomarkers in several clinical trials.”

([Sergej M., 2015](#))

# ANTI-APOPTOSIS

“**H2 exerts anti-apoptotic effects** by up- or down-regulating apoptosis-related factors. H2 further inhibits apoptosis by regulating signal transduction within and between specific pathways.”

([Li Ge et al., 2017](#))

Apoptosis is a type of cellular death.

# GENE EXPRESSION

“The anti-inflammatory and anti-apoptotic properties of H2 could be realized by **modulating the expression of pro-inflammatory and inflammatory cytokines and apoptosis-related factors.**”

([Li Ge et al., 2017](#))

# ALLERGIC REACTIONS

“**H2 may also protect against allergic reactions** by directly modulating FcεRI-related signaling, rather than through radical-scavenging activity.”

([Li Ge et al., 2017](#))



## ORAL INTAKE OF MOLECULAR HYDROGEN

“Unlike gaseous H<sub>2</sub>, solubilized H<sub>2</sub> [H<sub>2</sub>-dissolved water or hydrogen-rich water (HW)] is portable, safe, and easily administered. (...) **Drinking HW produced beneficial effects in disease models**, such as Parkinson's disease, oral palatal wound, radiation-induced oxidative injuries, periodontal tissue aging, and depressive-like behavior.”

(Li Ge et al., 2017)

“**Oral hydrogen alleviates** lipid metabolism disorder in metabolic syndrome and diabetes and ameliorates acute and chronic inflammation biomarkers in clinical trials.”

(Sergej M., 2015)

“The amount of intestinal H<sub>2</sub> produced is much larger than that of H<sub>2</sub> absorbed from water or gas, but only the effects of exogenously administered H<sub>2</sub> have attracted the attention of the medical field at present. (...) No H<sub>2</sub> dose-response effects have been observed thus far. (...) After HW is consumed, most H<sub>2</sub> in the blood is undetectable within 30 min, likely due to expiration from the lungs. **Thus, how a low amount of HW over a short exposure period can be effective remains unknown.** However, Kamimura and colleagues found that H<sub>2</sub> could accumulate in the liver with glycogen, which may partly explain this phenomenon. (...) **Nevertheless, HW is as effective as, and sometimes more effective than, H<sub>2</sub>.**”

(Li Ge et al., 2017)

# ACID-ALKALINE BALANCE & ATHLETIC PERFORMANCE

“Drinking alkaline water such as ERW can neutralize acid waste and maintain proper pH balance in the body.”

([B. Rubik, 2011](#))

“These results support the hypothesis that HRW administration is safe and **may have an alkalizing effect** in young physically active men.”

([Sergej M., 2014](#))

“Hydrogen-rich water might be an appropriate and safe hydration strategy that **helps athletes to become less susceptible to exercise-induced acidosis.**”

([P.Drid, 2016](#))

“The results of the present study indicate that **drinking alkalized water improves hydration status, acid-base balance, and high-intensity anaerobic exercise performance.**”

([Chycki J., 2018](#))

“Drinking electrolyzed hydrogen water (EHW) during endurance exercise in a heated environment **did not affect the exercise-induced acidification of blood, body fluid balance, or exercise performance.** However, it lowered the energy expenditure during the 60 min pedaling exercise, suggesting the **potential benefit of ingesting EHW during endurance exercise** in the heat.”

([Hiroto Ito., 2020](#))

“To conclude, acute pre-exercise supplementation with HRW **reduced blood lactate at higher exercise intensities, improved exercise-induced perception of effort, and ventilatory efficiency.**”

([Botek, M., 2019](#))

“Our findings suggest HW drinking as a **useful strategy to maintain good physical condition during athletic competition or training camps.**”

([Dobashi, S., 2020](#))

# CANCER

**Elevated rates of reactive oxygen species (ROS) have been detected in almost all cancers, promoting many aspects of tumor development and progression.**

“ERW inhibit the binding of telomerase to telomere region via telomere binding proteins, resulting in the shortening of telomere length.” ([Shirahata et al., 1999](#))

This team of researchers concluded that **ERW may cause telomere shortening in cancer cells.** Telomere shortening **can act as a tumor suppressor.**

“It [ERW] **activated the cancer-immune systems, suppressing the tumor growth** *in vivo*.” ([Shirahata S., 2002](#))

“**ERW suppresses tumor angiogenesis** by scavenging intracellular ROS and suppressing vascular endothelial growth factor's gene expression and secretion.” ([Ye et al., 2008](#))

Angiogenesis is the creation of new blood vessels. If this is suppressed in tumors, it means **fewer nutrients, thus, more prone to die.**

ERW suppresses the growth of cancer cells and microorganisms *in vitro*. ([Hamasaki et al., 2005](#), [Komatsu et al., 2001](#))

“**Alkaline reduced water (ARW) showed significant anticancer effect.** (...) Both ROS scavenging effect and immuno-modulation effect might be responsible for anticancer effect of alkaline reduced water.” ([Lee, K., 2004](#))

“**H2 has potential as an anti-cancer therapeutic** and could reduce radio/chemotherapeutic side effects in patients.” ([Li Ge et al., 2017](#))

# DIABETES

**The chronic presence of high glucose blood levels enhances the production of ROS. Diabetes also disturbs natural antioxidant defense systems. Both an increase in ROS and a decrease in the antioxidant defense mechanism lead to increased oxidative stress in diabetes. H<sub>2</sub> is a ROS scavenger and has antioxidant properties.**

“ERW, with ROS scavenging ability, reduced the blood glucose concentration, increased blood insulin level, improved glucose tolerance, and preserved b-cell mass in mice. The present data suggest that ERW may protect against b-cell damage and would be helpful for anti-diabetic agents.” ([Kim et al., 2007](#))

“In conclusion, these results suggest that supplementation with hydrogen-rich water may have a beneficial role in the prevention of type 2 diabetes mellitus and insulin resistance.” ([Kajiyama, S., 2008](#))

“The present results suggest the potential benefit of H<sub>2</sub> in improving obesity, diabetes, and metabolic syndrome in mice.” ([Kamimura, N. et al., 2011](#))

“The synergistic effect of AEW and regular walking are an advisable treatment for patients with type 2 diabetes mellitus.” ([Yohanes, A., 2020](#))

ERW derived from tap water improves the symptoms of diabetes model in mice. ([Jin et al., 2006](#), [Kim and Kim, 2006](#))

# DIGESTIVE HEALTH

## GUT MICROBIOME

The gut microbiome is deeply associated with our health through a symbiotic relationship. Recent reports have described that most gastrointestinal microbial species (gut microbiome) encode the genetic capacity to metabolize molecular hydrogen, meaning that molecular hydrogen might affect the gut microbial composition. Nevertheless, the exact effects of ERW on the gut microbiome remain unknown.

“Drinking such water [ERW] favors the growth of residential microflora in the gut.”

([N.V. Vorobjeva, 2005](#))

“Although the definitive role of gut microbes of ERW-administered mice remains unknown, our data demonstrate the **possibility that ERW administration affects the gut microbial composition and that it has beneficial health effects in terms of cholesterol metabolism and liver protection.**”

([Higashimura, Y. et al., 2018](#))

“The high negative ORP of ERW favors the growth of key anaerobic bacteria in the human gut that are important for normal intestinal microflora, the health of the colon, and optimum nutrition”

([B. Rubik, 2011](#))

# GASTROINTESTINAL SYMPTOMS

“Drinking ARW for eight weeks **improves the quality of life in patients with diarrhea-predominant IBS.**” ([Shin DW, 2018](#))

“Drinking hydrogen-rich water **may protect healthy individuals from gastric damage** caused by oxidative stress.” ([Jinling, 2014](#))

[Hayakawa et al.](#) reported the **inhibitory effect of ERW ingestion on abnormal intestinal fermentation.**

[Tashiro et al.](#) examined the effect of ingesting ERW vs. purified tap water (as a placebo) for four weeks in patients with abdominal pain such as heartburn, stomach discomfort, abdominal bloating, diarrhea, constipation, etc. They reported that **the results of the ERW group were superior to those of the placebo group.**

Apparatus that produce ERW have been **approved as medical devices by the Japanese Ministry of Health, Labour, and Welfare;** ERW is thought to be effective for functional gastrointestinal disorders.

## STOMACH ACIDITY

Our stomach pH is around 1-2, which is highly acidic. This is needed to break down foods, facilitate digestion and nutrient absorption and kill most pathogens that may enter our body via the digestive tract. **Due to its high alkalinity, ERW can slightly change our stomach's pH.**

To have smooth and efficient digestion, **it is recommended to stop drinking ERW 30 minutes before any meal and start drinking 1 or 2 hours again after eating.** During meals, it is recommended to drink pH 7 Neutral Water (if you can drink it warm or hot, it will be very beneficial for your digestion).

# NEUROPROTECTIVE

**The human brain is the most significant energy-consuming tissue in the body. For that reason, the brain is considered the most vulnerable part of the human body against the reactive oxygen species (ROS). Studies have also shown that molecular hydrogen can easily penetrate the blood-brain barrier, meaning that molecular hydrogen can easily reach the brain.**

"The results suggest that ERW is beneficial for the prevention and alleviation of oxidative stress-induced human neurodegenerative diseases." ([Yan, H., et al., 2011](#))

"ERW has proven to scavenge intracellular ROS and exhibited a protective effect against neuronal network damage caused by H<sub>2</sub>O<sub>2</sub> (hydrogen peroxide) in N1E-115 cells. (...) These results collectively demonstrated for the first time that **ERW protects several types of neuronal cells by scavenging ROS.**" ([Kashiwagi, 2014](#))

"Our data suggest that the **beneficial effects of hydrogen-rich water on depressive-like behavior in mice** may be mediated by suppression of the inflammasome activation resulting in attenuated protein IL-1 $\beta$  and ROS production." ([Zhang, Y., 2016](#))

"These results suggest that **HRW may reinforce Quality Of Life** through effects that increase central nervous system functions involving mood, anxiety, and autonomic nerve function." ([Mizuno, K., 2018](#))

"More specifically, **H<sub>2</sub> has protective effects against a variety of diseases, particularly nervous system disorders**, which include ischemia/reperfusion injury, traumatic injury, subarachnoid hemorrhage, neuropathic pain, neurodegenerative diseases, cognitive dysfunction induced by surgery and anesthesia, anxiety, and depression." ([Chen, W., 2021](#))

# RHEUMATOID ARTHRITIS

Rheumatoid arthritis (RA) is a chronic inflammatory disease characterized by the destruction of bone and cartilage. While the mechanisms responsible for the onset of RA remain unclear, reactive oxygen species (ROS) play a significant role in developing this condition.

**“The symptoms of RA were significantly improved with high H<sub>2</sub> water.”**

(Ishibashi, T., 2012)

“Recently, it has been demonstrated that consumption of water with a concentration of molecular hydrogen significantly **improved the disease activity and reduces the oxidative stress in RA**, which may imply a novel therapeutic target in RA.”

(Meng, 2016)

“The possible expectations regarding the potential benefits of H<sub>2</sub> by reducing the oxidative stress, resulting from inflammatory factors, are raised and discussed here. They include prevention of RA and related atherosclerosis, as well as **therapeutic validity for RA.**”

(Ishibashi, T., 2013)

# EFFECT ON DNA

ROS generation is thought to cause extensive oxidative damage to various biomolecules. DNA is one of the main targets of this oxidative damage. As a selective antioxidant, H<sub>2</sub> has the power to scavenge hydroxyl radical and peroxynitrite, two of the most damaging oxidants. They both damage DNA, RNA, and proteins. H<sub>2</sub> may be the ideal DNA protective molecule.

**“Reduced water suppresses single-strand breakage of DNA by active oxygen species produced.”** ([Shirahata, S. et al., 1997](#))

“Hydrogen-rich water prepared by AC-electrolysis may be **effective in improving systemic DNA oxidative injuries.**” ([Asada, 2020](#))

“Electrolyzed-reduced water (ERW) which is produced near the cathode during electrolysis of water **scavenges reactive oxygen species and protects DNA from oxidative damage.**” ([Shirahata, 1997](#))

**“Oxidative damage of the DNA was almost completely prevented upon treatment with electrolyzed reduced water.”** ([Park, Eun-Ju, 2005](#))

# LIVE BLOOD ANALYSIS

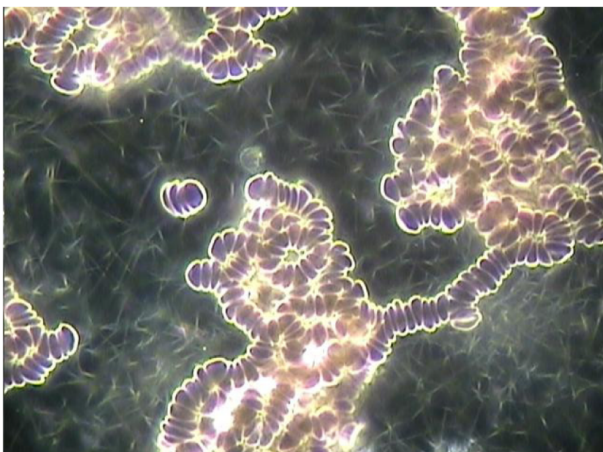
Rubik, B. *Studies And Observations On The Health Effects Of Drinking Electrolyzed-Reduced Alkaline Water, 2011.*

The blood is the most easily monitored tissue that can show rapid changes that correlate with health and disease. This study observed that persons drinking ERW show exceptionally clean biological terrains as monitored by live blood analysis.

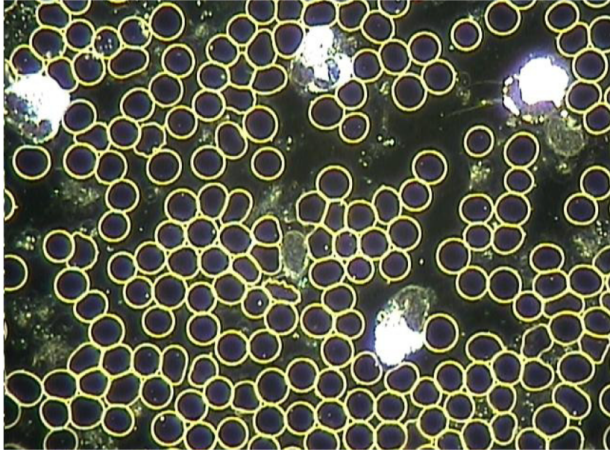
Live blood analysis visually examines a small droplet of fresh capillary blood typically taken from the fingertip, put onto a glass slide, and immediately observed under a high-powered light microscope equipped with a dark-field condenser. It provides an assessment of the ecology of the blood, the “biological terrain.”

## EXPERIMENT

Analysis of the blood of a 65 years old male. The red blood cells (RBCs) are sticky and tightly clumped together. Fibrin (white threads) is present, indicating that blood coagulation and clotting have been activated. This shows systemic inflammation.



Peripheral circulation was also impaired for this subject because only a single RBC can move freely through the smallest capillaries. Poor circulation in the extremities is a common complaint of the elderly.



Following this test, **the subject, M, age 65, drank 1 to 1.5 liters/day of ERW from an ionizer for six months but made no other changes in diet or lifestyle.** The RBC stickiness, aggregation, and clotting factors are no longer present. It is striking to see this change in an older person's blood. Although this is a single case presented here, numerous other cases have also been observed.

From observing changes in the biological terrain apparently due to consumption of ERW, it appears that **ERW may be a helpful intervention to mitigate activation of the clotting and inflammatory pathways. Long-term consumption of ERW may improve blood circulation and possibly help prevent the chronic diseases of our times.** Drinking alkaline water such as ERW can neutralize acid waste and maintain proper pH balance in the body.

In conclusion, a growing body of scientific and clinical literature shows increasing support for ERW as a “functional” drinking water that **scavenges free radicals, diminishes systemic inflammation,** and is a valuable adjunct for **treating ROS-associated diseases,** including diabetes, kidney disease, cancer, and cardiovascular disease.

From observations of the blood, it appears to mitigate early blood clotting and systemic inflammation seen as sticky, aggregated RBCs and fibrin. Collectively, this evidence points to ERW as a healthy drinking water that **slows down the effects of aging.** More research is recommended to study its anti-aging and anti-inflammatory effects further.

# OTHER PHYSIOLOGICAL FUNCTIONS

## ANTI-ARTERIOESCLEROSIS

Hydrogen-supplemented water also suppresses arteriosclerosis. ERW suppresses the Cu<sup>2+</sup>-catalyzed oxidation of human LDL and suppresses triglyceride levels in mice fed high-fat foods. ([Abe et al., 2010](#))

## SUPPRESSIVE EFFECTS OF THE SIDE EFFECTS OF CANCER DRUGS

Hydrogen-supplemented water suppresses the side effects of anti-cancer drugs. ([Shirahata, S. et al., 2012](#))

## LIVER PROTECTIVE EFFECT

ERW exhibits hepatoprotective (liver protective) effects against CCl<sub>4</sub>-induced liver damage in mice. ([Tsai et al., 2009](#))

## HANGOVERS

ERW also exhibits an anti-hangover effect. ([Park et al., 2009](#))

## PROTECTS FROM ENVIRONMENTAL STRESSORS

ERW could increase thermotolerance and resistance to UV irradiation. ([Park, SK., Kim, JJ., Yu, A.R. et al. 2012](#))

## KIDNEY PROTECTIVE EFFECT

ERW exhibits potent nephroprotective (kidney protective) effects on cisplatin-induced kidney damage in mice, likely due to increased antioxidant-defense system activity and the inhibition of lipid peroxidation. ([Tse-ChouCheng, et al., 2018](#))

## DETOXIFYING EFFECT

ERW increases the activity of a critical detoxifying enzyme in the body, superoxide dismutase, which protects against free radical damage both in aging and chronic degenerative disease. ([B. Rubik, 2011](#))

## HYDRATION

“A significant difference in whole blood viscosity was detected in this study when assessing a high-pH, electrolyte water versus an acceptable standard purified water during the recovery phase following strenuous exercise-induced dehydration.” ([Weidman, 2016](#))

This study showed that ERW has a higher degree of hydration in the body; the specific mechanisms are still unknown.

## WOUND HEALING

“The results of this study support the hypothesis that oral administration of hydrogen-rich water would be beneficial during the wound healing process by decreasing oxidative stress and inflammatory responses.” ([Tamaki, 2015](#))

# REFERENCES

S. (2019b, September 26). Biological Roles of Water: Why is water necessary for life? Science in the News. <https://sitn.hms.harvard.edu/uncategorized/2019/biological-roles-of-water-why-is-water-necessary-for-life/>

Xing-Fang Li and William A. Mitch

Environmental Science & Technology 2018 52 (4), 1681-1689 DOI: 10.1021/acs.est.7b05440

Harjan, Israa & Alduhaidhawi, Athraa & Zaidan, Haider. (2019). HEALTH EFFECTS OF CHLORINATED WATER: A REVIEW ARTICLE. Pakistan Journal of Biotechnology. 16. 163-167. 10.34016/pjbt.2019.16.3.24. [https://www.researchgate.net/publication/336532964\\_HEALTH\\_EFFECTS\\_OF\\_CHLORINATED\\_WATER\\_A\\_REVIEW\\_ARTICLE](https://www.researchgate.net/publication/336532964_HEALTH_EFFECTS_OF_CHLORINATED_WATER_A_REVIEW_ARTICLE)

June K. Dunnick, Ronald L. Melnick, Assessment of the Carcinogenic Potential of Chlorinated Water: Experimental Studies of Chlorine, Chloramine, and Trihalomethanes, *JNCI: Journal of the National Cancer Institute*, Volume 85, Issue 10, 19 May 1993, Pages 817-822, <https://doi.org/10.1093/jnci/85.10.817>

Villanueva, C. M. (2003, March 1). Meta-analysis of studies on individual consumption of chlorinated drinking water and bladder cancer. *Journal of Epidemiology & Community Health*. <https://jech.bmj.com/content/57/3/166.short>

Ge, L., Yang, M., Yang, N. N., Yin, X. X., & Song, W. G. (2017). Molecular hydrogen: a preventive and therapeutic medical gas for various diseases. *Oncotarget*, 8(60), 102653-102673. <https://doi.org/10.18632/oncotarget.21130>

Pérez-Hernández EG, Pedraza-Chaverri J. Antioxidant properties of electrolyzed reduced water and hydrogen. *Rev Esp Cienc Salud*. 2011;14(1):5-13.

Sergej M. Ostojic (2015) Molecular hydrogen: An inert gas turns clinically effective, *Annals of Medicine*, 47:4, 301-304, DOI: 10.3109/07853890.2015.1034765

Bentham Science Publishers. (2011). Recent Progress Toward Hydrogen Medicine: Potential of Molecular . . . : Ingenta Connect. Ingenta. <https://www.ingentaconnect.com/content/ben/cpd/2011/00000017/00000022/art00002>

Korovljević, D., Trivić, T., Drid, P. *et al.* Molecular hydrogen affects body composition, metabolic profiles, and mitochondrial function in middle-aged overweight women. *Ir J Med Sci* 187, 85–89 (2018). <https://doi.org/10.1007/s11845-017-1638-4>

Sergej M. Ostojic & Marko D. Stojanovic (2014) Hydrogen-Rich Water Affected Blood Alkalinity in Physically Active Men, *Research in Sports Medicine*, 22:1, 49-60, DOI: 10.1080/15438627.2013.852092

Is molecular hydrogen beneficial to enhance post-exercise recovery in female athletes? (2016, September 1). ScienceDirect. <https://www.sciencedirect.com/science/article/abs/pii/S0765159716300363>

Chycki J, Kurylas A, Maszczyk A, Golas A, Zajac A (2018) Alkaline water improves exercise-induced metabolic acidosis and enhances anaerobic exercise performance in combat sport athletes. *PLoS ONE* 13(11): e0205708. <https://doi.org/10.1371/journal.pone.0205708>

Hiroto Ito, Shigeru Kabayama & Kazushige Goto (2020) Effects of electrolyzed hydrogen water ingestion during endurance exercise in a heated environment on body fluid balance and exercise performance, *Temperature*, 7:3, 290-299, DOI: 10.1080/23328940.2020.1742056

M.B.J.K.č.A.J.M.K.B.S.č.N.N. (2019). Hydrogen Rich Water Improved Ventilatory, Perceptual and Lactate Responses to Exercise. *International Journal of Sports Medicine*. <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/a-0991-0268>

Dobashi, S., Takeuchi, K., & Koyama, K. (2020). Hydrogen-rich water suppresses the reduction in blood total antioxidant capacity induced by 3 consecutive days of severe exercise in physically active males. *Medical gas research*, 10(1), 21–26. <https://doi.org/10.4103/2045-9912.279979>

Shirahata S. *et al.* (2002) Telomere Shortening in Cancer Cells by Electrolyzed-Reduced Water. In: Ikura K., Nagao M., Masuda S., Sasaki R. (eds) *Animal Cell Technology: Challenges for the 21st Century*. Springer, Dordrecht. [https://doi.org/10.1007/0-306-46869-7\\_62](https://doi.org/10.1007/0-306-46869-7_62)

Shirahata S. (2002) Reduced Water for Prevention of Diseases. In: Shirahata S., Teruya K., Katakura Y. (eds) *Animal Cell Technology: Basic & Applied Aspects*. *Animal Cell Technology: Basic & Applied Aspects*, vol 12. Springer, Dordrecht. [https://doi.org/10.1007/978-94-017-0728-2\\_5](https://doi.org/10.1007/978-94-017-0728-2_5)

Komatsu T. et al. (2001) Suppressive Effect of Electrolyzed-Reduced Water on the Growth of Cancer Cells and Microorganisms. In: Lindner-Olsson E., Chatzissavidou N., Lüllau E. (eds) *Animal Cell Technology: From Target to Market*. ESACT Proceedings, vol 1. Springer, Dordrecht. [https://doi.org/10.1007/978-94-010-0369-8\\_50](https://doi.org/10.1007/978-94-010-0369-8_50)

Lee K. (2004, September 1). Anticancer Effect of Alkaline Reduced Water(International Conference on Mind Body Science : Physical and Physiological Approach joint with The Eighteenth Symposium on Life Information Science). 2004 国際生命情報科学会. [https://www.jstage.jst.go.jp/article/islis/22/2/22\\_KJ00000786802/\\_article/-char/ja/](https://www.jstage.jst.go.jp/article/islis/22/2/22_KJ00000786802/_article/-char/ja/)

Kim M. (2007). Preservative Effect of Electrolyzed Reduced Water on Pancreatic  $\beta$ -Cell Mass in Diabetic db/db Mice. 2007 The Pharmaceutical Society of Japan. [https://www.jstage.jst.go.jp/article/bpb/30/2/30\\_2\\_234/\\_article/-char/ja/](https://www.jstage.jst.go.jp/article/bpb/30/2/30_2_234/_article/-char/ja/)

Supplementation of hydrogen-rich water improves lipid and glucose metabolism in patients with type 2 diabetes or impaired glucose tolerance. (2008, March 1). ScienceDirect. <https://www.sciencedirect.com/science/article/abs/pii/S0271531708000237>

Kamimura N, Nishimaki K, Ohsawa I, Ohta S. Molecular hydrogen improves obesity and diabetes by inducing hepatic FGF21 and stimulating energy metabolism in db/db mice. *Obesity (Silver Spring)*. 2011 Jul;19(7):1396-403. doi: 10.1038/oby.2011.6. Epub 2011 Feb 3. PMID: 21293445.

Rias, Y. A., Kurniawan, A. L., Chang, C. W., Gordon, C. J., & Tsai, H. T. (2020). Synergistic Effects of Regular Walking and Alkaline Electrolyzed Water on Decreasing Inflammation and Oxidative Stress, and Increasing Quality of Life in Individuals with Type 2 Diabetes: A Community Based Randomized Controlled Trial. *Antioxidants*, 9(10), 946. doi:10.3390/antiox9100946

Anti-diabetic effects of electrolyzed reduced water in streptozotocin-induced and genetic diabetic mice. (2006, November 10). ScienceDirect. <https://www.sciencedirect.com/science/article/abs/pii/S0024320506005923>

Anti-Diabetic Effect of Alkaline-Reduced Water on OLETF Rats. (n.d.). Taylor & Francis. <https://www.tandfonline.com/doi/abs/10.1271/bbb.70.31>

Vorobjeva NV. Selective stimulation of the growth of anaerobic microflora in the human intestinal tract by electrolyzed reducing water. *Med Hypotheses*. 2005;64(3):543-6. doi: 10.1016/j.mehy.2004.07.038. PMID: 15617863.

Higashimura, Y., Baba, Y., Inoue, R., Takagi, T., Uchiyama, K., Mizushima, K., Hirai, Y., Ushiroda, C., Tanaka, Y., & Naito, Y. (2018). Effects of molecular hydrogen-dissolved alkaline electrolyzed water on intestinal environment in mice. *Medical gas research*, 8(1), 6-11. <https://doi.org/10.4103/2045-9912.229597>

Rubik, B. (2011, November 28). Studies And Observations On The Health Effects Of Drinking Electrolyzed-reduced Alkaline Water. WIT Press. <https://www.witpress.com/elibrary/wit-transactions-on-ecology-and-the-environment/153/22933>

Shin DW, Yoon H, Kim HS, Choi YJ, Shin CM, Park YS, Kim N, Lee DH. Effects of Alkaline-Reduced Drinking Water on Irritable Bowel Syndrome with Diarrhea: A Randomized Double-Blind, Placebo-Controlled Pilot Study. *Evid Based*

*Complement Alternat Med*. 2018 Apr 15;2018:9147914. doi: 10.1155/2018/9147914. PMID: 29849734; PMCID: PMC5925025.

Xue, J., Shang, G., Tanaka, Y., Saihara, Y., Hou, L., Velasquez, N., Liu, W., & Lu, Y. (2014). Dose-dependent inhibition of gastric injury by hydrogen in alkaline electrolyzed drinking water. *BMC complementary and alternative medicine*, 14, 81. <https://doi.org/10.1186/1472-6882-14-81>

Tashiro, H., Katahara, T., Fujiyama, Y., & Bamma, T. (2001). Clinical Evaluation of alkaline-ionized water for chronic diarrhea : placebo-controlled double-blind study.

Kashiwagi, T., Yan, H., Hamasaki, T., Kinjo, T., Nakamichi, N., Teruya, K., Kabayama, S., & Shirahata, S. (2014). Electrochemically reduced water protects neural cells from oxidative damage. *Oxidative medicine and cellular longevity*, 2014, 869121. <https://doi.org/10.1155/2014/869121>

Mizuno, K., Sasaki, A. T., Ebisu, K., Tajima, K., Kajimoto, O., Nojima, J., Kuratsune, H., Hori, H., & Watanabe, Y. (2018). Hydrogen-rich water for improvements of mood, anxiety, and autonomic nerve function in daily life. *Medical gas research*, 7(4), 247-255. <https://doi.org/10.4103/2045-9912.222448>

Chen, W., Zhang, HT. & Qin, SC. Neuroprotective Effects of Molecular Hydrogen: A Critical Review. *Neurosci. Bull.* 37, 389-404 (2021). <https://doi.org/10.1007/s12264-020-00597-1>

Zhang, Y., Su, WJ., Chen, Y. *et al.* Effects of hydrogen-rich water on depressive- like behavior in mice. *Sci Rep* 6, 23742 (2016). <https://doi.org/10.1038/srep23742>

Yan, H., Kashiwaki, T., Hamasaki, T., Kinjo, T., Teruya, K., Kabayama, S., & Shirahata, S. (2011). The neuroprotective effects of electrolyzed reduced water and its model water containing molecular hydrogen and Pt nanoparticles. *BMC proceedings*, 5 Suppl 8(Suppl 8), P69. <https://doi.org/10.1186/1753-6561-5-S8-P69>

Ishibashi, T., Sato, B., Rikitake, M., Seo, T., Kurokawa, R., Hara, Y., Naritomi, Y., Hara, H., & Nagao, T. (2012). Consumption of water containing a high concentration of molecular hydrogen reduces oxidative stress and disease activity in patients with rheumatoid arthritis: an open-label pilot study. *Medical gas research*, 2(1), 27. <https://doi.org/10.1186/2045-9912-2-27>

Meng, J., Yu, P., Jiang, H., Yuan, T., Liu, N., Tong, J., Chen, H., Bao, N., & Zhao, J. (2016). Molecular hydrogen decelerates rheumatoid arthritis progression through inhibition of oxidative stress. *American journal of translational research*, 8(10), 4472-4477.

Bentham Science Publishers. (2013). Molecular Hydrogen: New Antioxidant and Anti-inflammatory Therapy. . . .: Ingenta Connect. Ingenta. <https://www.ingentaconnect.com/content/ben/cpd/2013/00000019/00000035/art00013>

Electrolyzed Reduced Water Scavenges Active Oxygen Species and Protects DNA from Oxidative Damage. (1997, May 8). ScienceDirect. <https://www.sciencedirect.com/science/article/abs/pii/S0006291X97966225>

Asada, R., Tazawa, K., Sato, S., & Miwa, N. (2020). Effects of hydrogen-rich water prepared by alternating-current-electrolysis on antioxidant activity, DNA oxidative injuries, and diabetes-related markers. *Medical gas research*, 10(3), 114-121. <https://doi.org/10.4103/2045-9912.296041>

Park, E. (2005). Protective Effect of Electrolyzed Reduced Water on the Paraquat-induced Oxidative Damage of Human Lymphocyte DNA -Applied Biological Chemistry | Korea Science. KoreaScience. <https://www.koreascience.or.kr/article/JAKO200508410694939.page>

Abe M. et al. (2010) Suppressive Effect of ERW on Lipid Peroxidation and Plasma Triglyceride Level. In: Kamihira M., Katakura Y., Ito A. (eds) Animal Cell Technology: Basic & Applied Aspects. Animal Cell Technology: Basic & Applied Aspects, vol 16. Springer, Dordrecht. [https://doi.org/10.1007/978-90-481-3892-0\\_52](https://doi.org/10.1007/978-90-481-3892-0_52)

Advanced research on the health benefit of reduced water. (2012, February 1). ScienceDirect. <https://www.sciencedirect.com/science/article/pii/S0924224411002408#bib50>

Tsai, C. F., Hsu, Y. W., Chen, W. K., Chang, W. H., Yen, C. C., Ho, Y. C., & Lu, F. J. (2009). Hepatoprotective effect of electrolyzed reduced water against carbon tetrachloride-induced liver damage in mice. *Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association*, 47(8), 2031-2036. <https://doi.org/10.1016/j.fct.2009.05.021>

Park, S. K., Qi, X. F., Song, S. B., Kim, D. H., Teng, Y. C., Yoon, Y. S., Kim, K. Y., Li, J. H., Jin, D., & Lee, K. J. (2009). Electrolyzed-reduced water inhibits acute ethanol-induced hangovers in Sprague-Dawley rats. *Biomedical research (Tokyo, Japan)*, 30(5), 263-269. <https://doi.org/10.2220/biomedres.30.263>

Park, SK., Kim, JJ., Yu, A.R. *et al.* Electrolyzed-reduced water confers increased resistance to environmental stresses. *Mol. Cell. Toxicol.* **8**, 241-247 (2012). <https://doi.org/10.1007/s13273-012-0029-1>

Cheng, T. C., Hsu, Y. W., Lu, F. J., Chen, Y. Y., Tsai, N. M., Chen, W. K., & Tsai, C. F. (2018). Nephroprotective effect of electrolyzed reduced water against cisplatin-induced kidney toxicity and oxidative damage in mice. *Journal of the Chinese Medical Association : JCMA*, 81(2), 119-126.

Weidman, J., Holsworth, R. E., Jr, Brossman, B., Cho, D. J., St Cyr, J., & Fridman, G. (2016). Effect of electrolyzed high-pH alkaline water on blood viscosity in healthy adults. *Journal of the International Society of Sports Nutrition*, 13, 45. <https://doi.org/10.1186/s12970-016-0153-8>

Naofumi Tamaki, Rita Cristina Orihuela-Campos, Makoto Fukui, Hiro-O Ito, "Hydrogen-Rich Water Intake Accelerates Oral Palatal Wound Healing via Activation of the Nrf2/Antioxidant Defense Pathways in a Rat Model", *Oxidative Medicine and Cellular Longevity*, vol. 2016, Article ID 5679040, 13 pages, 2016. <https://doi.org/10.1155/2016/5679040>