CELLPOWER WATER®

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HYDROGEN WATER

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Hydrogen

It is certain that any water - to be water - needs hydrogen.
But in the H_2O molecule, since the two hydrogen atoms are bound to oxygen, they are no longer available for other interactions.

Hydrogenated water is a water in which hydrogen (H_2) molecules are free and accessible for use by our body.

The reduced size of the Hydrogen allows a rapid penetration of the cellular membranes, acting as antioxidant
and protecting against the effect of elements that behave like free radicals.

First of all:

It’s safe.

“There are no safety issues with hydrogen; it has been used for years in gas mixtures for deep diving and in numerous clinical trials **without adverse events**, and there are no warnings in the literature of its toxicity or long term exposure effects.”

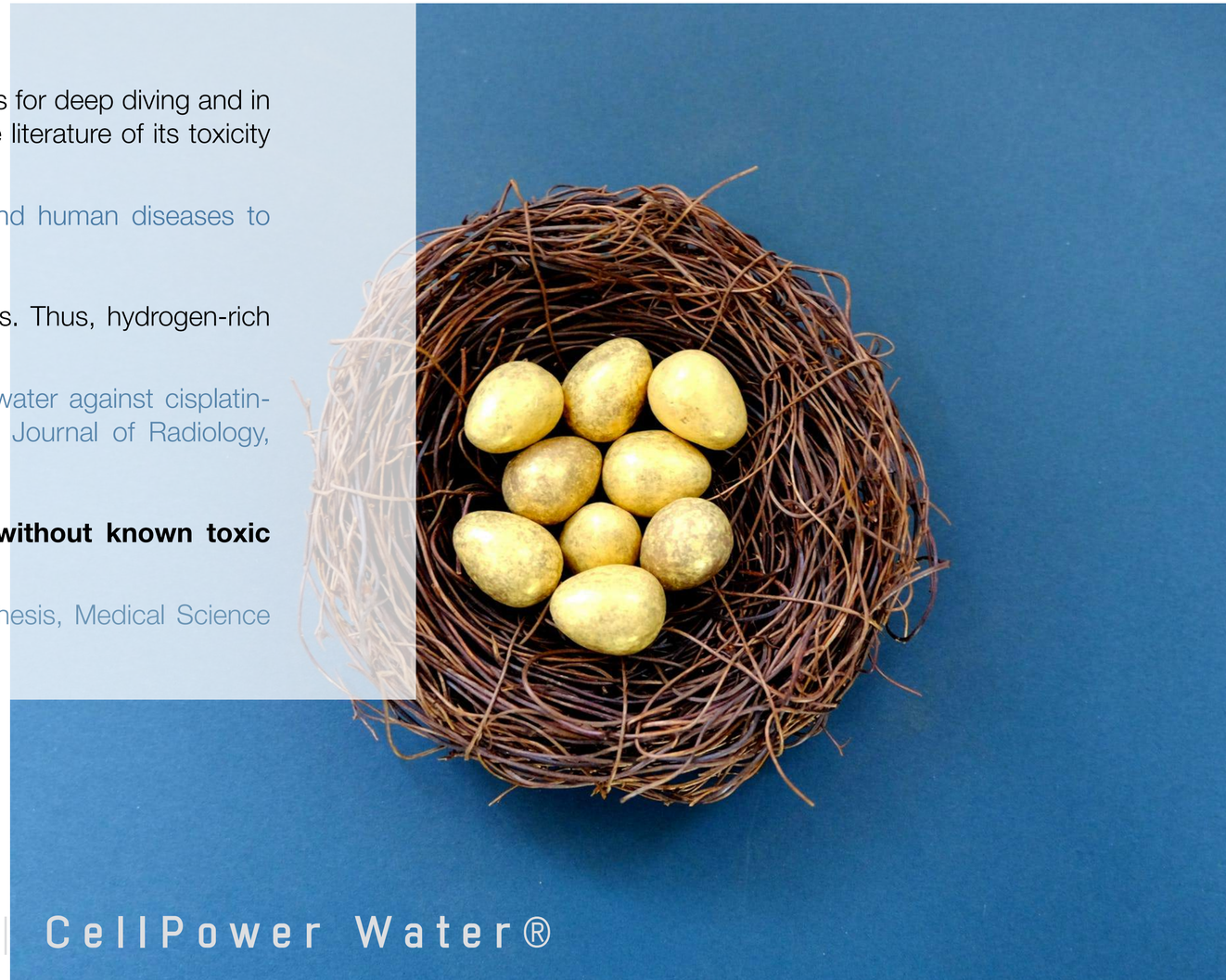
Nicolson, G. L. et al., Clinical effects of hydrogen administration: From animal and human diseases to exercise medicine, International Journal of Clinical Medicine, 2016.

“If too much hydrogen is taken in, the excess would be expired through the lungs. Thus, hydrogen-rich water has **great potential for clinical use**.”

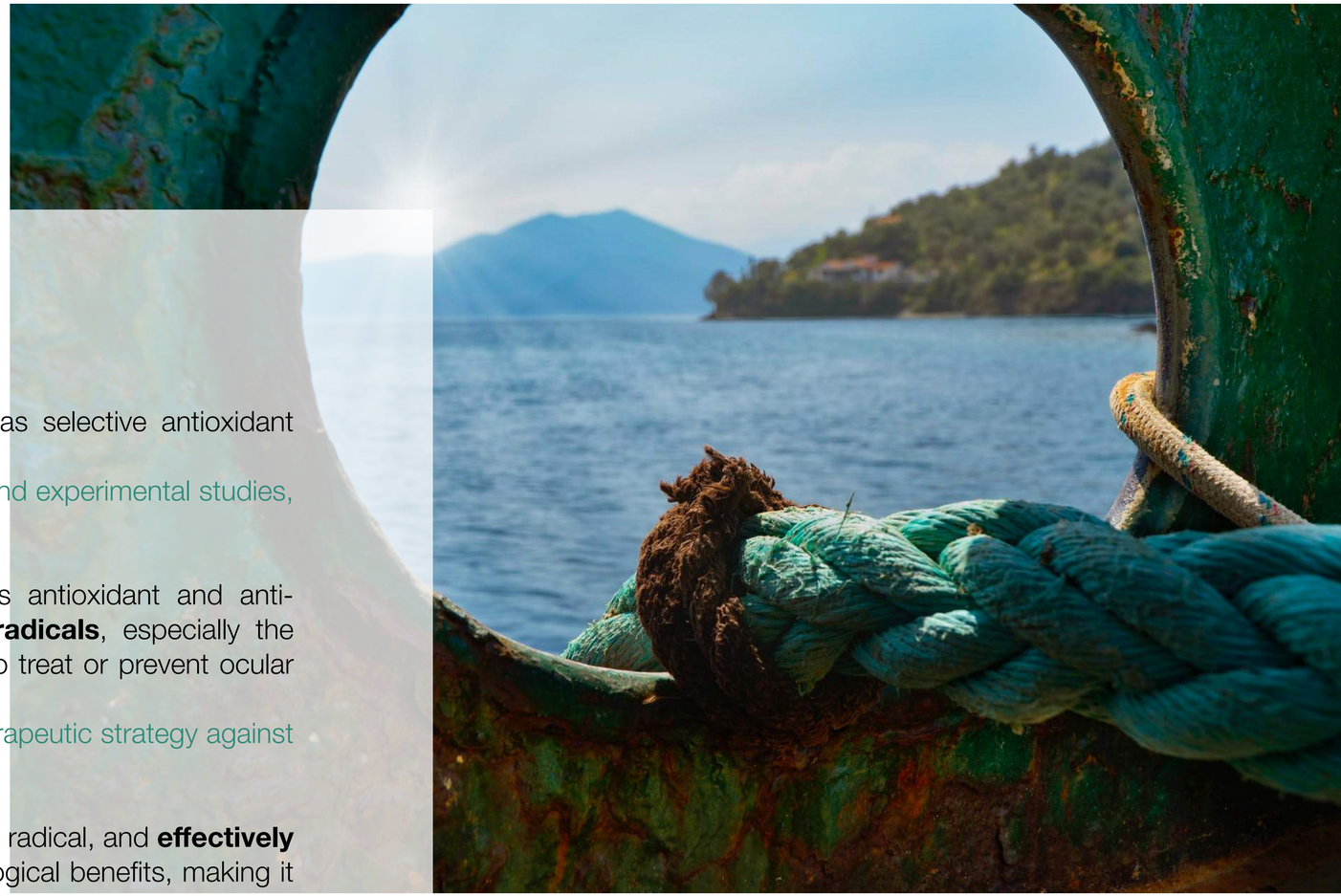
Kitamura, A. et al., Experimental verification of protective effect of hydrogen-rich water against cisplatin-induced nephrotoxicity in rats using dynamic contrast-enhanced CT, The British Journal of Radiology, 2010.

“Hydrogen as a natural molecule could be a **safe and effective antioxidant without known toxic effects.**”

Qin, L. et al., Hydrogen-rich saline as an innovative therapy for cataract: A hypothesis, Medical Science Monitor, 2016.



Antioxidant



"H2 is emerging as a novel and safe therapeutic antioxidant. It has selective antioxidant properties, giving it **anti-inflammatory properties**."
Hong et al., Hydrogen as a selective antioxidant: A review of clinical and experimental studies, Journal of International Medical Research, 2010.

"Hydrogen can modulate several biological functions, and exhibits antioxidant and anti-inflammatory effects. The ability of hydrogen to **neutralize free radicals**, especially the hydroxyl radicals as well as other detrimental ROS, can be utilized to treat or prevent ocular disorders related to oxidative stress."
Huang et al., The potential utilizations of hydrogen as a promising therapeutic strategy against ocular diseases, Therapeutics and Clinical Risk Management, 2016.

"Hydrogen selectively reduces the hydroxyl radical, the most toxic free radical, and **effectively protects cells**. It does not react with free radicals that have physiological benefits, making it an incredibly effective therapy to **neutralize acute oxidative stress**."
Ohsawa et al., Hydrogen acts as a therapeutic antioxidant by selectively reducing cytotoxic oxygen radicals, Nature Medicine, 2007.

"The fact that H2 **protected mitochondria and nuclear DNA** provided evidence that H2 penetrated most membranes and diffused into organelles."
Ohta, Recent progress toward hydrogen medicine: Potential of molecular hydrogen for preventive and therapeutic applications, Current Pharmaceutical Design, 2011.

Cancer

"The consumption of hydrogen-rich water for 6 weeks reduced reactive oxygen metabolites in the blood and maintained blood oxidation potential. QOL scores during radiotherapy were significantly improved in patients treated with hydrogen-rich water compared to patients receiving placebo water. Daily consumption of hydrogen-rich water is a potentially novel, therapeutic strategy for **improving QOL after radiation exposure**. Consumption of hydrogen-rich water reduces the biological reaction to radiation-induced oxidative stress **without compromising anti-tumor effects**."
Kang et al., Effects of drinking hydrogen-rich water on the quality of life of patients treated with radiotherapy for liver tumors, Medical Gas Research, 2011.

"Oxidative stress is involved in cancer development. Hydrogen (H_2) is a potent antioxidant and exhibits **anti-inflammatory and potentially anticancer-like activities**. High-content hydrogen water can inhibit colon cancer, particularly in combination with 5-fluorouracil."
Runtuwene et al., Hydrogen-water enhances 5-fluorouracil-induced inhibition of colon cancer, PeerJ, 2015.

"Neutral hydrogen-enriched water was shown to achieve tumor-preferential growth inhibition and tumor invasion together with scavenging of intracellular oxidants, and is expected as a **preventive material against tumor progression and invasion**."
Saitoh et al., Neutral pH hydrogen-enriched electrolyzed water achieves tumor-preferential clonal growth inhibition over normal cells and tumor invasion inhibition concurrently with intracellular oxidant repression, Oncology Research Featuring Preclinical and Clinical Cancer Therapeutics, 2008.

"Consumption with HW **decreased the incidence of renal cell carcinoma and suppressed tumor growth**…"
Li et al., Consumption of hydrogen-rich water protects against ferric nitrilotriacetate-induced nephrotoxicity and early tumor promotional events in rats, Food and Chemical Toxicology, 2013.

"Pt-nc-supplemented HD-water is expected as a novel agent against human tongue cancers due to its **cancer progression-repressive abilities**. "
Saitoh et al., Platinum nanocolloid-supplemented hydrogen dissolved water inhibits growth of human tongue carcinoma cells preferentially over normal cells, Experimental Oncology, 2009.

Radiation

"This study suggests H2 as an **effective radioprotective agent on immune system** by scavenging reactive oxygen species."
Zhao et al., Protective effect of hydrogen-rich saline against radiation-induced immune dysfunction, Journal of Cellular and Molecular Medicine, 2014.

"…hydrogen-rich saline might be an effective and specific method of **managing and preventing osteoradionecrosis of the jaw**."
Tian et al., Hydrogen-rich saline may be an effective and specific novel treatment for osteoradionecrosis of the jaw, Therapeutics and Clinical Risk Management, 2015.

Brain

"Molecular hydrogen given in drinking water … suggests that it could be an easily administered, **highly effective treatment for traumatic brain injury**."
Dohi et al., Molecular hydrogen in drinking water protects against neurodegenerative changes induced by traumatic brain injury, PLOS ONE, 2014.

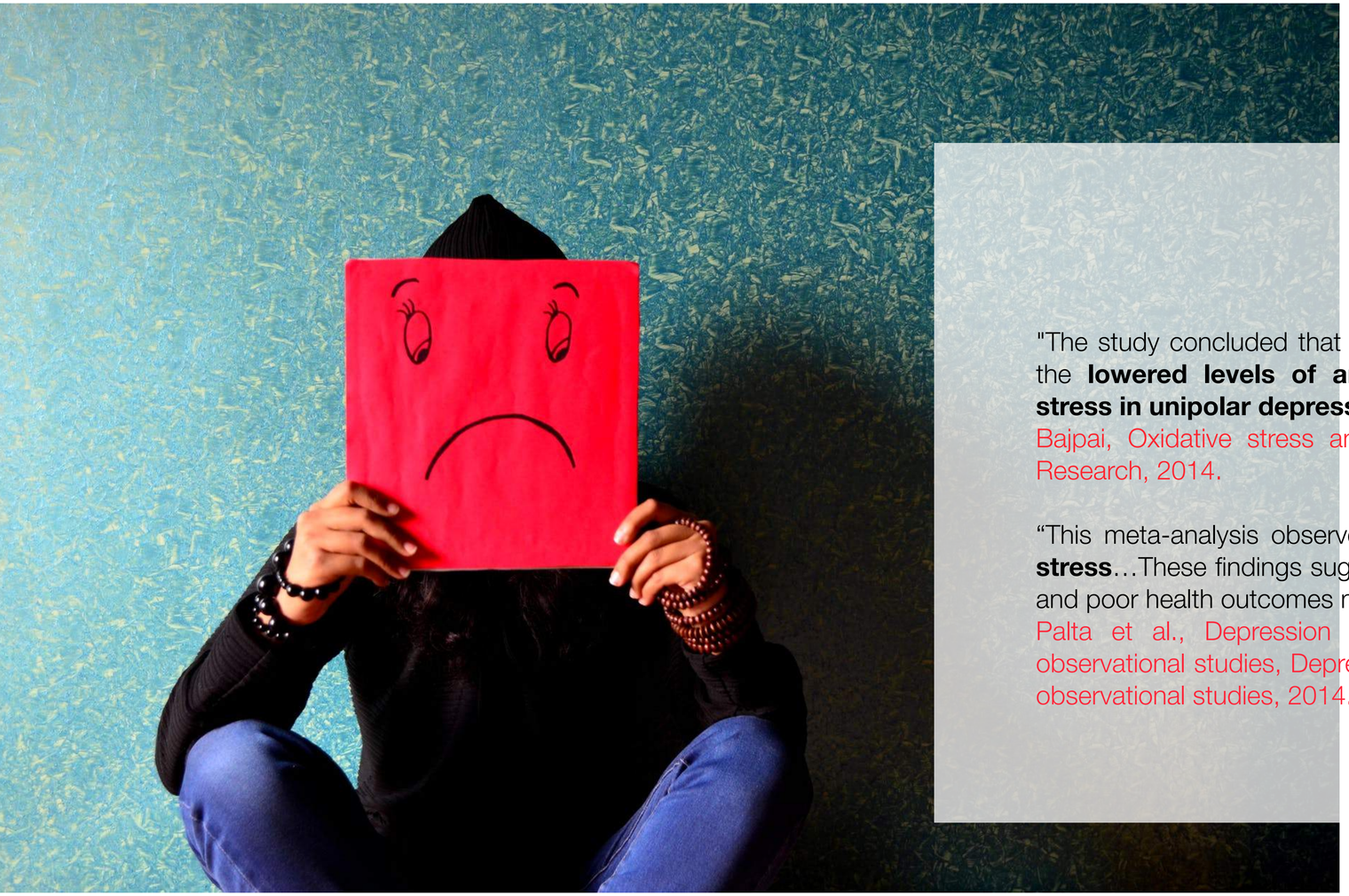
"This study suggests that ingestion of hydrogen-rich water can **improve neurological function** due to its ability to penetrate the blood-brain barrier and neutralize reactive oxygen species."
Takeuchi et al., Hydrogen improves neurological function through attenuation of blood–brain barrier disruption in spontaneously hypertensive stroke-prone rats, BioMed Central Neuroscience, 2015.

"We observed that administration of hydrogen-rich saline **decreased the number of apoptotic cells, suppressed oxidative stress, and improved locomotor functions**. In conclusion, hydrogen-rich saline reduced acute spinal cord contusion injury, possibly by reduction of oxidative stress and elevation of BDNF."
Chen et al., Hydrogen-rich saline protects against spinal cord injury in rats, Neurochemical Research, 2010.

"Hydrogen-rich saline prevented amyloid beta-induced neuroinflammation and oxidative stress, which may contribute to the **improvement of memory dysfunction**."
Li et al., Hydrogen-rich saline improves memory function in a rat model of amyloid-beta-induced Alzheimer's disease by reduction of oxidative stress, Brain Research, 2010.

"Hydrogen appears to be promising as an effective, yet inexpensive way to **reduce cerebral edema caused by surgical procedures**. Hydrogen has the potential to improve clinical outcome, decrease hospital stay, and reduce overall cost to patients and the health care system."
Eckermann et al., Hydrogen is neuroprotective against surgically induced brain injury, Medical Gas Research, 2011.

"These results suggest that hydrogen-rich saline can **protect the brain against the deleterious effects of mild traumatic brain injury**."
Hou et al., Hydrogen-rich saline protects against oxidative damage and cognitive deficits after mild traumatic brain injury, Brain Research Bulletin, 2012.



Depression

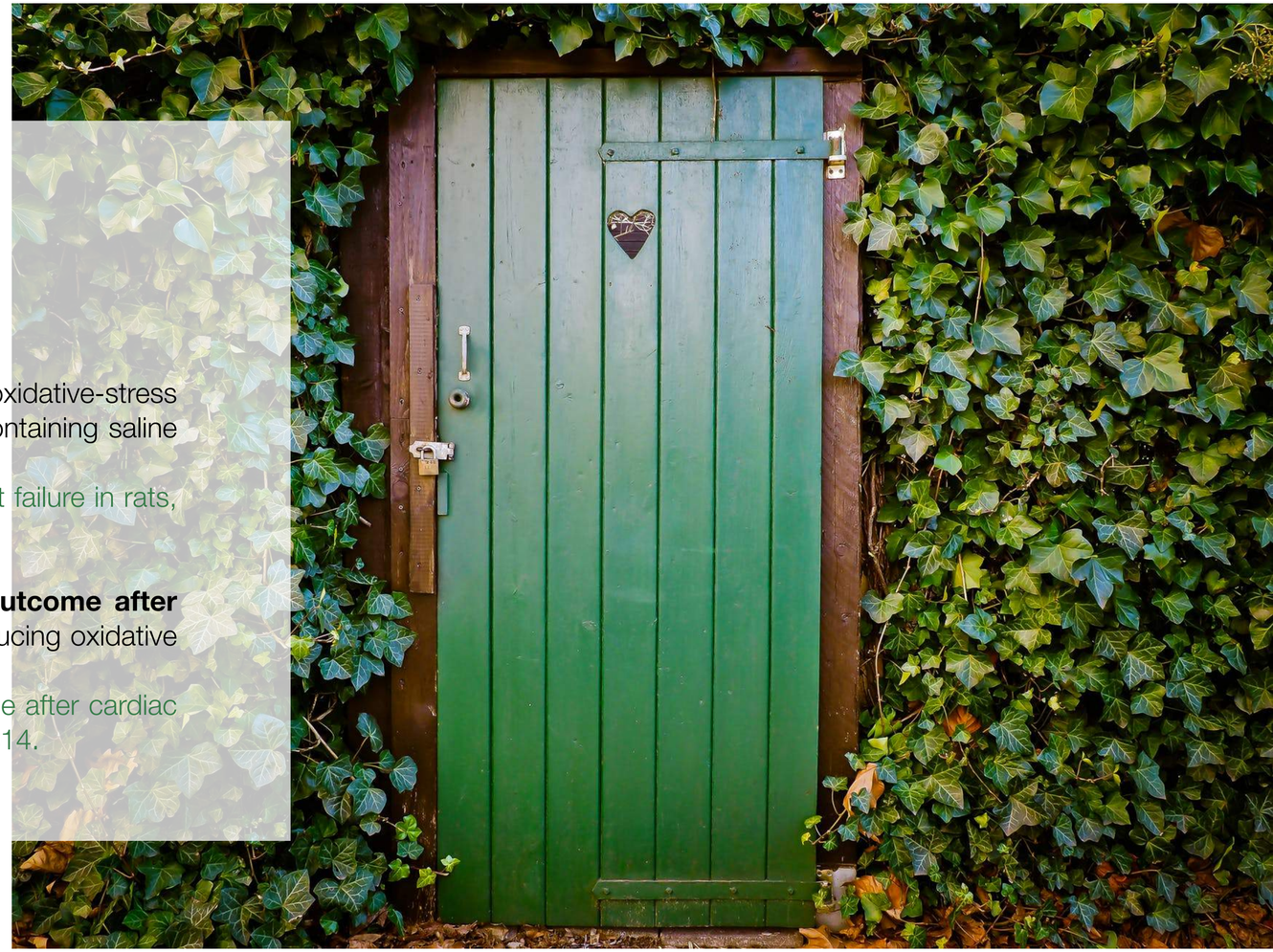
"The study concluded that in the absence of known oxidative injury causative agents, the **lowered levels of antioxidants…implicate the high degree of oxidative stress in unipolar depression**."
Bajpai, Oxidative stress and major depression, Journal Of Clinical And Diagnostic Research, 2014.

"This meta-analysis observed an **association between depression and oxidative stress**…These findings suggest that well-established associations between depression and poor health outcomes may be mediated by high oxidative stress."
Palta et al., Depression and oxidative stress: Results from a meta-analysis of observational studies, Depression and oxidative stress: Results from a meta-analysis of observational studies, 2014.

Heart

“Cardiac function was significantly improved and that the plasma levels of oxidative-stress markers and myocardial autophagic activity were decreased…hydrogen-containing saline may have **beneficial effects for doxorubicin-induced heart failure.**”
Wu et al., Hydrogen-containing saline attenuates doxorubicin-induced heart failure in rats, Pharmazie, 2014.

“Hydrogen-rich saline treatment **improved survival and neurological outcome after cardiac arrest/resuscitation** in rats, which was partially mediated by reducing oxidative stress, inflammation, and apoptosis.”
Huo et al., Hydrogen-rich saline improves survival and neurological outcome after cardiac arrest and cardiopulmonary resuscitation in rats, Anesthesia & Analgesia, 2014.



Atherosclerosis

"Hydrogen Water intake may **prevent lipid deposition in the rat aorta** induced by periodontitis by decreasing serum ox-LDL levels and aortic oxidative stress."
Ekuni et al., Hydrogen-rich water prevents lipid deposition in the descending aorta in a rat periodontitis model, Archives of Oral Biology, 2012.

"The oxidative stress level of aorta was decreased…Thus, consumption of H_2-dissolved water has the **potential to prevent atherosclerosis**."
Ohsawa et al., Consumption of hydrogen water prevents atherosclerosis in apolipoprotein E knockout mice, Biochemical and Biophysical Research Communications, 2008.

Cholesterol

"Supplementation with H_2-rich water seems to **decrease serum LDL-C and apoB levels**, **improve dyslipidemia-injured HDL functions**…and it may have a beneficial role in prevention of potential metabolic syndrome."
Song et al., Hydrogen-rich water decreases serum LDL-cholesterol levels and improves HDL function in patients with potential metabolic syndrome, The Journal of Lipid Research, 2013.

"The present findings highlight the potential role of H2 in the **regression of hypercholesterolemia and atherosclerosis.**"
Song et al., Hydrogen activates ATP- binding cassette transporter A1-dependent efflux ex vivo and improves high-density lipoprotein function in patients with hypercholesterolemia: A double-blinded, randomized, and placebo- controlled trial, The Journal of Clinical Endocrinology & Metabolism, 2015.

Performance

"Adequate hydration with hydrogen-rich water pre-exercise reduced blood lactate levels and **improved exercise-induced decline of muscle function**."

Aoki et al., Pilot study: Effects of drinking hydrogen-rich water on muscle fatigue caused by acute exercise in elite athletes, Medical Gas Research, 2012.

"The consumption of hydrogen-rich water by healthy athletes engaging in intense exercise **helped to reduce the level of acidosis**, suggesting that hydrogen-rich water provides benefits as a neutralizing agent."

Ostojic, Serum alkalinization and hydrogen-rich water in healthy men, Mayo Clinic Proceedings, 2012.

Liver

"HRW has **significant therapeutic potential in APAP-induced hepatotoxicity** by inhibiting oxidative stress and inflammation and **promoting liver regeneration**."
Zhang, Hydrogen-rich water protects against acetaminophen-induced hepatotoxicity in mice, World Journal of Gastroenterology, 2015.

"Oxidative stress is a strong contributor to the progression from simple fatty liver to **nonalcoholic steatohepatitis** (NASH). Consumption of hydrogen-rich water may be an **effective treatment** for NASH by reducing hepatic oxidative stress, apoptosis, inflammation, and hepatocarcinogenesis."
Kawai et al., Hydrogen-rich water prevents progression of nonalcoholic steatohepatitis and accompanying hepatocarcinogenesis in mice, Hepatology, 2012.

"HS could **protect against liver injury** and also **inhibit the processes leading to liver cirrhosis** and hepatocyte compensatory."
Sun et al., The protective role of hydrogen-rich saline in experimental liver injury in mice, Journal of Hepatology, 2011.

Lungs

"Saturated hydrogen saline **decreased lung edema**…**alleviated hyperoxia-induced pulmonary injury.**"
Zheng et al., Saturated hydrogen saline protects the lung against oxygen toxicity, Undersea Hyperbaric Medicine: Journal of the Undersea and Hyperbaric Medical Society, 2010.

"Administration of hydrogen-rich saline **dramatically reduced the pulmonary levels of pulmonary inflammation mediators** and myeloperoxidase."
Fang et al., Hydrogen-rich saline protects against acute lung injury induced by extensive burn in rat model, Journal of Burn Care & Research, 2011

Kidneys

"Long-term ad libitum consumption of H_2-enriched electrolyzed water can **ameliorate the processes of kidney injury** and cardiac remodeling…by suppressing, at least partly, elevated inflammation and oxidative stress."
Zhu et al., Amelioration of cardio-renal injury with aging in dahl salt-sensitive rats by H2-enriched electrolyzed water, Medical Gas Research, 2013.

"…it has **therapeutic potential for renal dysfunction** in patient with type 2 diabetes and metabolic syndrome."
Katakura et al., Hydrogen-rich water inhibits glucose and α,β -dicarbonyl compound-induced reactive oxygen species production in the SHR, Medical Gas Research, 2012.

"Our findings highlight the potential value of hydrogen-rich saline as a **new therapeutic method on acute renal injury** in severe acute pancreatitis clinically."
Shi et al., Hydrogen-rich saline attenuates acute renal injury in sodium taurocholate-induced severe acute pancreatitis by inhibiting ROS and NF-κB pathway, Mediators of Inflammation , 2015.

Type I Diabetes

"Our study demonstrates that H_2 exerts **metabolic effects similar to those of insulin** and may be a **novel therapeutic alternative to insulin** in type 1 diabetes mellitus that can be administered orally."

Amitani et al., Hydrogen improves glycemic control in type1 diabetic animal model by promoting glucose uptake into skeletal muscle, PLOS ONE, 2013.

"These results suggest that electrolyzed reduced water can **prevent apoptosis of pancreatic β-cells** and the development of symptoms in type 1 diabetes model mice by alleviating the alloxan-derived generation of reactive oxygen species."

Li et al., Suppressive effects of electrolyzed reduced water on alloxan-induced apoptosis and type 1 diabetes mellitus, Cytotechnology, 2010.

Type II Diabetes

"Supplementation with molecular hydrogen-rich water may have a beneficial role in the **prevention of type 2 diabetes and insulin resistence** by helping to stabilize blood sugar, which is a critical aspect of long-term weight loss."

Kajiyama et al., Supplementation of hydrogen-rich water improves lipid and glucose metabolism in patients with type 2 diabetes or impaired glucose tolerance, Nutrition Research, 2008.

"Active hydrogen water is capable of anti-oxidation and it also has a **controlling effect on the blood glucose level in type 2 diabetes**."

Gu et al., Anti type 2 diabetic effect and anti-oxidation effect in active hydrogen water administration KK-Ay mice, Medicine and Biology, 2006.

"Long-term drinking H_2-water **significantly controlled fat and body weights**, despite no increase in consumption of diet and water. The present results suggest the potential benefit of H_2 in improving obesity, diabetes, and metabolic syndrome."

Kamimura et al., Molecular hydrogen improves obesity and diabetes by inducing hepatic FGF21 and stimulating energy metabolism in db/db mice, Obesity, 2011.

Osteoporosis

"Treatment with molecular hydrogen **alleviates microgravity-induced bone loss** through abating oxidative stress, restoring osteoblastic differentiation, and suppressing osteoclast differentiation and osteoclastogenesis."
Sun et al., Treatment of hydrogen molecule abates oxidative stress and alleviates bone loss induced by modeled microgravity in rats, Osteoporosis International, 2012.

"The **bone protective effects** of the hydrogen molecule (H2) have been demonstrated in several osteoporosis models."
Li et al., Treatment with hydrogen molecules prevents RANKL-induced osteoclast differentiation associated with inhibition of ROS formation and inactivation of MAPK, AKT and NF-kappa B pathways in murine RAW264.7 cells, Journal of Bone and Mineral Metabolism, 2013.

Multiple Sclerosis

"…our experiments suggest that HRW may have **great potential in the treatment of Multiple Sclerosis**."

Zhao et al., Hydrogen-rich water improves neurological functional recovery in experimental autoimmune encephalomyelitis mice, Journal of Neuroimmunology, 2016.

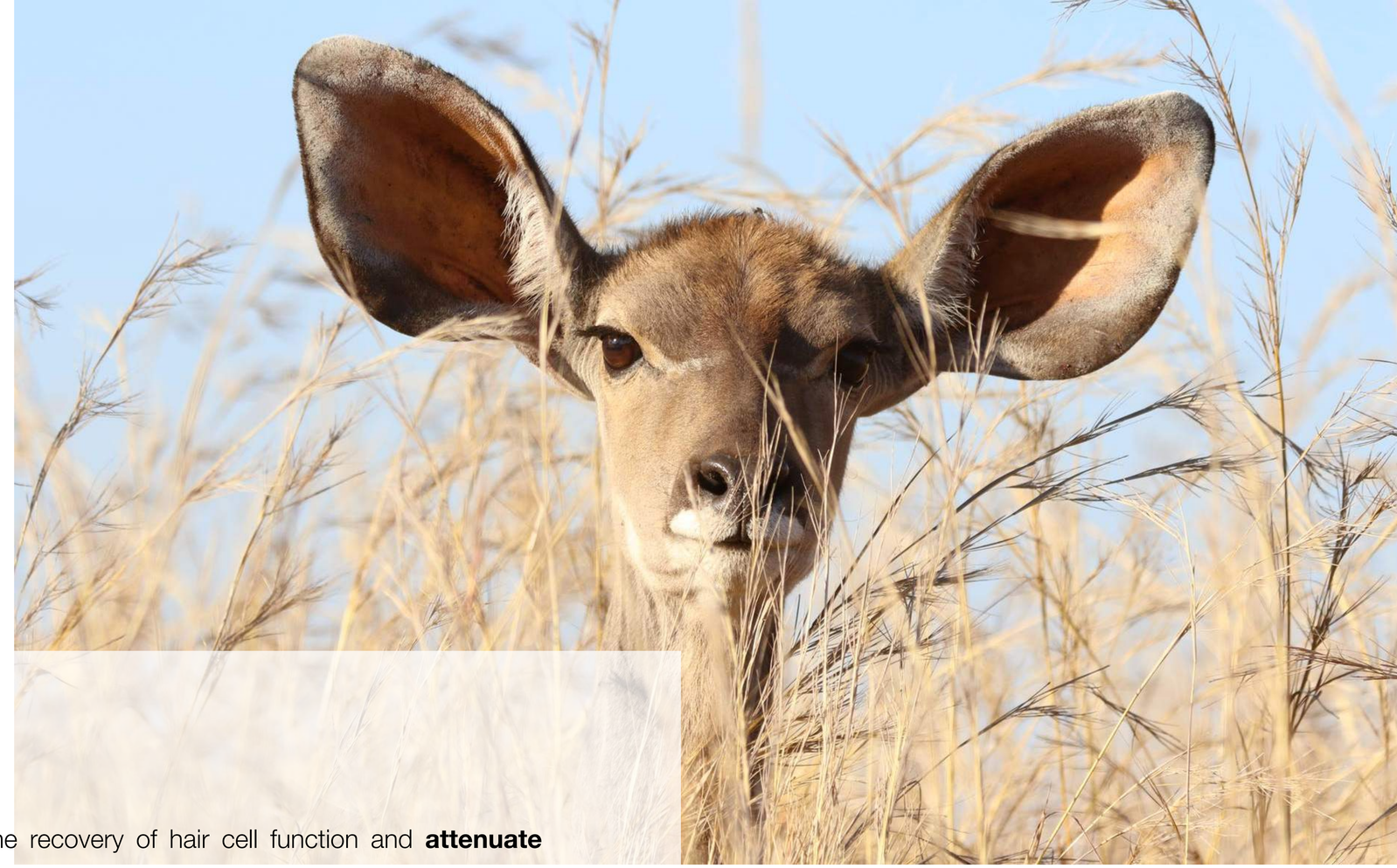
Rheumatoid Arthritis

"The results suggest that the hydroxyl radical scavenger H2 effectively reduces oxidative stress in patients with this condition. The **symptoms of RA were significantly improved** with high H_2 water."

Ishibashi et al., 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, 2012.

"We conducted a randomized, double-blind, placebo-controlled investigation of the infusion of 1 ppm H_2-dissolved saline (H_2-saline) in 24 RA patients. Drop i**nfusion of H_2 safely and effectively reduced RA disease activity**."

Ishibashi et al., Therapeutic efficacy of infused molecular hydrogen in saline on rheumatoid arthritis: A randomized, double-blind, placebo-controlled pilot study, International Immunopharmacology, 2014.



Hearing

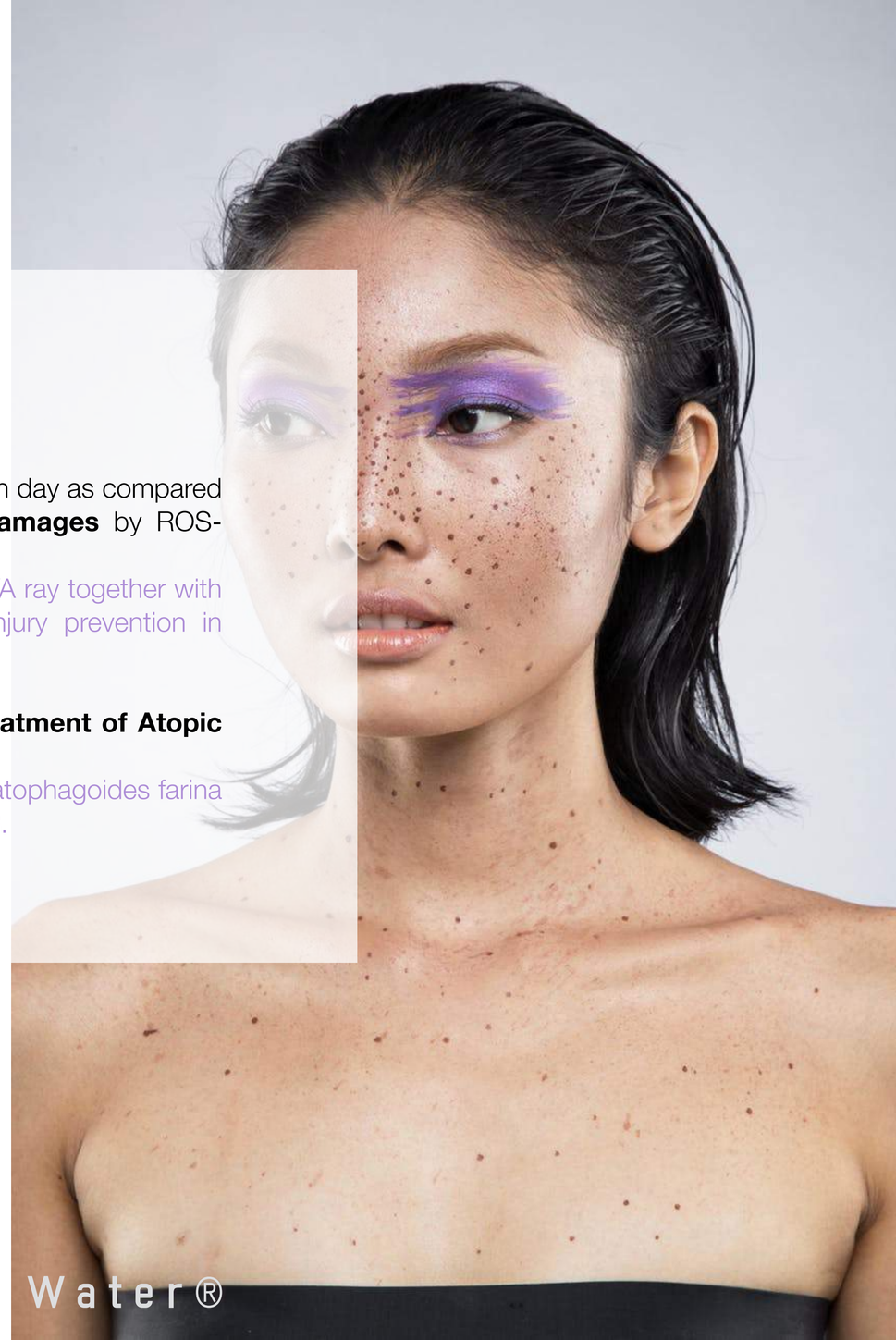
"These findings suggest that hydrogen can facilitate the recovery of hair cell function and **attenuate noise-induced temporary hearing loss**."
Lin et al., Hydrogen in drinking water attenuates noise-induced hearing loss in guinea pigs, Neuroscience Letters, 2011.

"Our findings suggest that hydrogen-saturated saline is **effective in preventing intensive narrow band noise-induced hearing loss** through the antioxidant effect."
Chen et al., Hydrogen-saturated saline protects intensive narrow band noise-induced hearing loss in guinea pigs through an antioxidant effect, PLOS ONE, 2014.

Skin

"HW-bathing **significantly improved wrinkle** in four subjects on the back of neck on 90th day as compared to 0 day. Thus, HW may serve as daily skin care to **repress UVA-induced skin damages** by ROS-scavenging and promotion of type-I collagen synthesis in dermis."
Kato et al., Hydrogen-rich electrolyzed warm water represses wrinkle formation against UVA ray together with type-I collagen production and oxidative-stress diminishment in fibroblasts and cell-injury prevention in keratinocytes, Journal of Photochemistry and Photobiology B: Biology, 2012.

"Hydrogen Water represents a **potentially alternative therapeutic and preventive treatment of Atopic Dermatitis**."
Ignacio et al., The drinking effect of hydrogen water on atopic dermatitis induced by dermatophagoides farina allergen in NC/ Nga mice. Evidence-Based Complementary and Alternative Medicine, 2013.



Vision

"Saturated hydrogen saline could **protect the retina from light-induced damage** by attenuating oxidative stress."
Feng et al., Protective effect of saturated hydrogen saline against blue light-induced retinal damage in rats, International Journal of Ophthalmology, 2012.

"H_2 may be an **effective and novel clinical tool for treating glaucoma** and other oxidative stress-related diseases."
Yokota et al., Protective effect of molecular hydrogen against oxidative stress caused by peroxynitrite derived from nitric oxide in rat retina, Clinical & Experimental Ophthalmology, 2015.

Acts as an antioxidant.

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