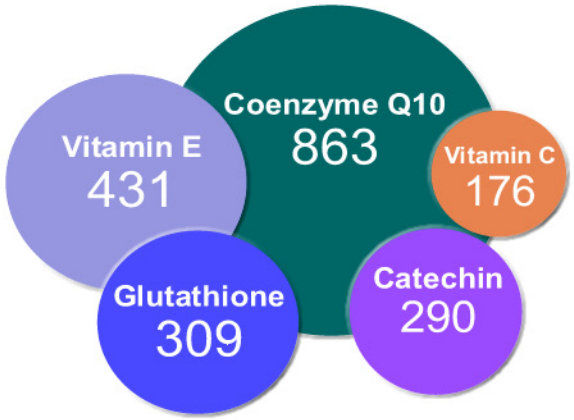
"MOLECULAR HYDROGEN ... better than any other ANTIOXIDANT"

Quoted by: Tyler LeBaron: Scientist and Founder of Molecular Hydrogen Foundation

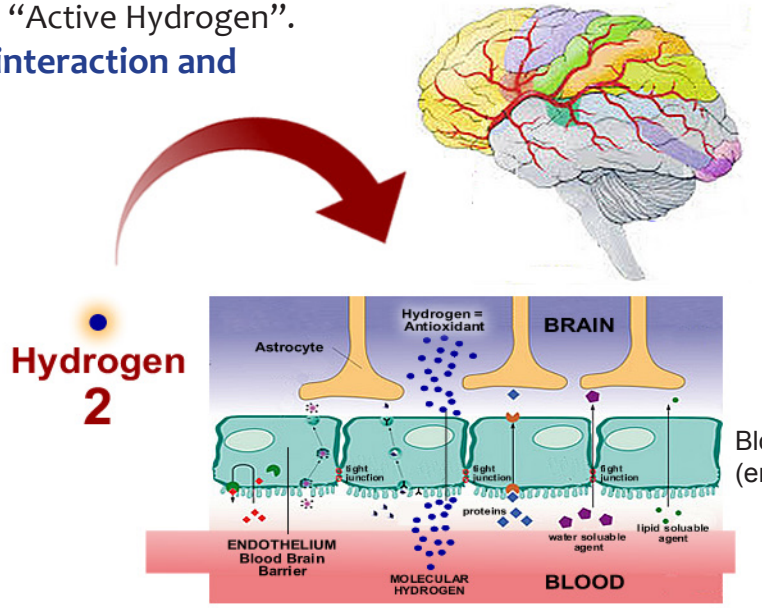
"HYDROGEN exerts a beneficial affect on **CELL SIGNALLING, CELL METABOLISM** and **GENE EXPRESSION,** giving it **ANTI-INFLAMMATORY, ANTI-ALLERGY** and **ANTI-OBESITY** effects.
HYDROGEN also triggers **AN INCREASE IN OUR BODY'S OWN ANTIOXIDANT SYSTEM ..."** *LeBaron*

Attached CLINICAL STUDY CONCLUSION: "The results suggest that ERW is beneficial for the prevention and alleviation of oxidative stress-induced human neurodegenerative diseases."

Molecular Hydrogen has also been translated/termed as "Active Hydrogen".
"Active Hydrogen blocks the telomere/telomerase interaction and makes the LIFETIME OF CANCER CELLS LIMITED."
Professor DR. SANETAKA SHIRAHATA



Molecular weights of different anti-oxidants vs. Hydrogen



Able to pass through blood-brain-barrier: oxygen, hydrogen, amino acids, glucose, alcohol, barbituate drugs, sodium, some bacteria.

Blood -Brain-Barrier (endothelial cells)

Cannot pass through blood-brain-barrier: viruses, most bacteria, larger molecules and other anti-oxidants

Created by: judith@water-corps.com

Molecular Hydrogen is the smallest molecule in existence. Because hydrogen is so small, it can penetrate deep into all cells to eliminate free radicals at their source: in the mitochondria. Also, due to its size, hydrogen can easily cross the blood-brain-barrier to eliminate free radicals in the brain. Molecular Hydrogen is created during the electrolysis process. Higher quality Electrolyzed Reduced Water (ERW) contains a lot of molecular hydrogen and a small amount of platinum nanoparticles.

ERW is known to protect DNA from oxidative damage. Molecular Hydrogen converts toxic oxygen radicals and turns them into water, leaving no by-products. Other antioxidants turn into weaker free radicals themselves after donating their electrons and neutralizing free radicals. **"The positive effects of hydrogen have been confirmed in 138 disease models (by 2014) and scientists are very excited about its impact on disease treatment and prevention. ... The interest in hydrogen research and technology is growing exponentially."** *LeBaron*

Yan et al. BMC Proceedings 2011, 5(Suppl 8):P69
http://www.biomedcentral.com/1753-6561/5/S8/P69

BMC Proceedings

MEETING ABSTRACT Open Access

The neuroprotective effects of electrolyzed reduced water and its model water containing molecular hydrogen and Pt nanoparticles

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From 22nd European Society for Animal Cell Technology (ESACT) Meeting on Cell Based Technologies
Vienna, Austria. 15-18 May 2011

Background

Human brain is the biggest energy consuming tissue in human body. Although it only represents 2% of the body weight, it receives 20% of total body oxygen consumption and 25% of total body glucose utilization. For that reason, brain is considered to be the most vulnerable part of human body against the reactive oxygen species (ROS), a by-product of aerobic respiration. Oxidative stress is directly related to a series of brain dysfunctional disease such as Alzheimer's disease, Parkinson's disease etc. Electrolyzed reduced water (ERW) is a functional drinking water containing a lot of molecular hydrogen and a small amount of platinum nanoparticles (Pt NPs, Table 1). ERW is known to scavenge ROS and protect DNA from oxidative damage [1]. We previously showed that ERW was capable of extending lifespan of *Caenorhabditis elegans* by scavenging ROS [2]. Molecular hydrogen could scavenge ROS and protected brain from oxidative stress [3]. Pt NPs are also a new type of multi-functional ROS scavenger [4].

Materials and methods

In this research, we used TI-200S ERW derived from 2 mM NaOH solution produced by a batch type electrolysis device and model waters containing molecular hydrogen and synthetic Pt NPs of 2-3 nm sizes as research models of ERW to examine the anti-oxidant capabilities of ERW on several kinds of neural cells such as PC12, N1E115, and serum free mouse embryo (SFME) cells. We pretreated the ERW and 200 μM H_2O_2 and examined the neuroprotective effects of ERW on PC12, N1E115 and SFME cells, using WST-8 method. We also examined the intracellular ROS scavenging effects of ERW on N1E115 cells after pretreated cells with ERW and H_2O_2 using DCFH-DA. We checked the protective effects of ERW on mitochondria and cytoplasm by Rh123 and Fuo-3 AM stain. We also examined the ATP production of SFME cells after pretreated with ERW and H_2O_2 by Bioluminescence Assay Kit. Finally, we used dissolved hydrogen (DH) and Pt NPs as research models to examine their neuroprotective effects.

Results

ERW significantly reduced the cell death induced by H_2O_2 pretreatment (Figure 1). ERW also scavenged the intracellular ROS and prevented the decrease of mitochondrial membrane potential and ATP production induced by ROS. We also examined the neuroprotective effects of molecular hydrogen and Pt NPs and showed that both molecular hydrogen and Pt NPs contributed to the neuroprotective effects of ERW.

Conclusion

The results suggest that ERW is beneficial for the prevention and alleviation of oxidative stress-induced human neurodegenerative diseases.

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Table 1 Characteristics of the water samples.The characteristics of water samples were determined immediately after the preparation of ERW. ERW, electrolyzed reduced water; CW, activated charcoal-treated water. The pH values were shown as average ± standard deviation (N = 5). The values of DH, DO and Pt NPs were shown the minimum and maximum values after 5 independent measurements.

	MQ (NaOH)	TI-200 ERW	TI-9000 CW	TI-9000 ERW
pH	11.3 ± 0.1	11.6 ± 0.1	7.9 ± 0.1	9.6 ± 0.2
Dissolved Hydrogen (mM)	0	0.2– 0.45	0	0.1– 0.25
Dissolved Oxygen (μM)	0	3.1– 78.1	0	0– 21.9
Pt NPs (nM)	0	0.5– 12.8	0	0– 3.6
Redox potential value (mV)	+ 350	-659	-	-

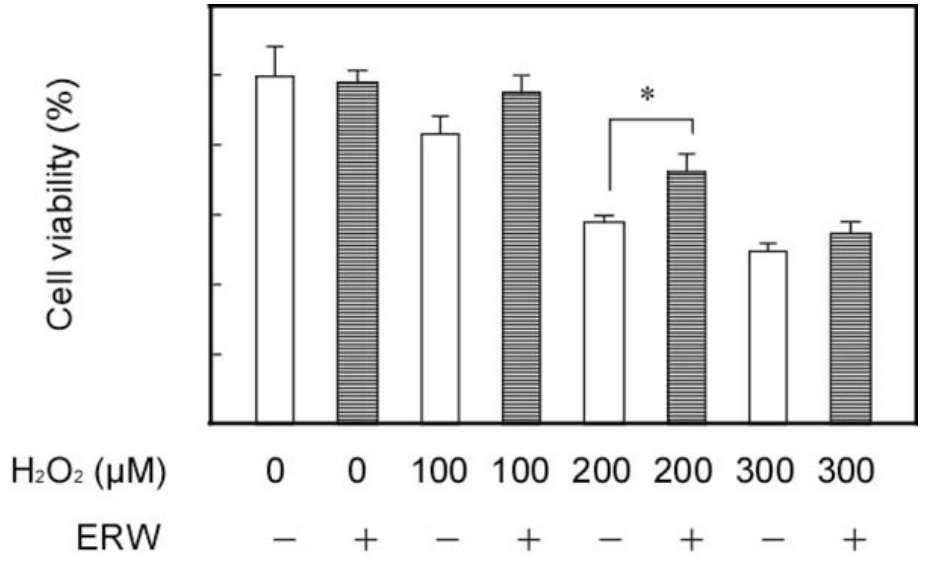

Figure 1 Protective effect of ERW on H_2O_2-induced neuroblastoma N1E115 cells death. Cells were treated with water samples (ERW and control ultrapure water with same pH with ERW) and 200 μM H_2O_2 for 24 h. Cell viabilities were assayed by WST-8 method. N=3, * $p < 0.05$.

Published: 22 November 2011

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doi:10.1186/1753-6561-5-S8-P69
Cite this article as: Yan *et al.*: The neuroprotective effects of electrolyzed reduced water and its model water containing molecular hydrogen and Pt nanoparticles. *BMC Proceedings* 2011 **5**(Suppl 8):P69.