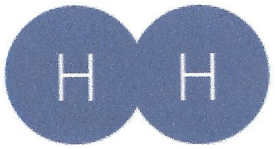
Molecular Hydrogen 101

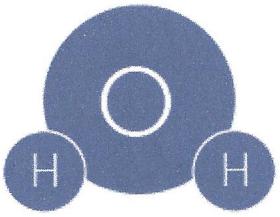
By primoh2 Posted December 3, 2014 In Blog

WHAT IS MOLECULAR HYDROGEN(H2)?



Molecular Hydrogen (H2)

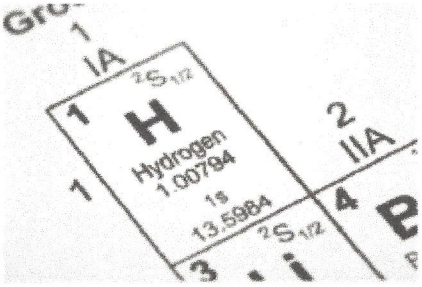
Molecular hydrogen is a molecule composed of two hydrogen atoms bonded to each other. This molecule does not commonly occur in nature. Most of the time, hydrogen is bonded to other atoms. For example, two hydrogen atoms are bonded to an oxygen atom in a water molecule.



Water (H2O)

Water is a very important part of our daily lives, and the two hydrogen atoms in water play a pivotal role in forming a water molecule. Hydrogen is a critical component in many other organic molecules such as carbohydrates, proteins, lipids, and DNA.

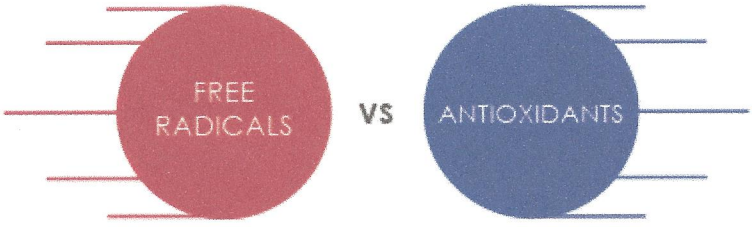
REMEMBER THE PERIODIC TABLE?



Hydrogen appears in the top left corner of the periodic table, and is denoted as 1. This means that hydrogen is the smallest, simplest, and most fundamental element. This makes molecular hydrogen (H2) the simplest molecule in existence. The exciting thing is that although H2 is so simple, it provides a variety health benefits that we are still continuously learning about today. The most significant way that H2 promotes optimal health is that H2 enhances your antioxidant defense system.

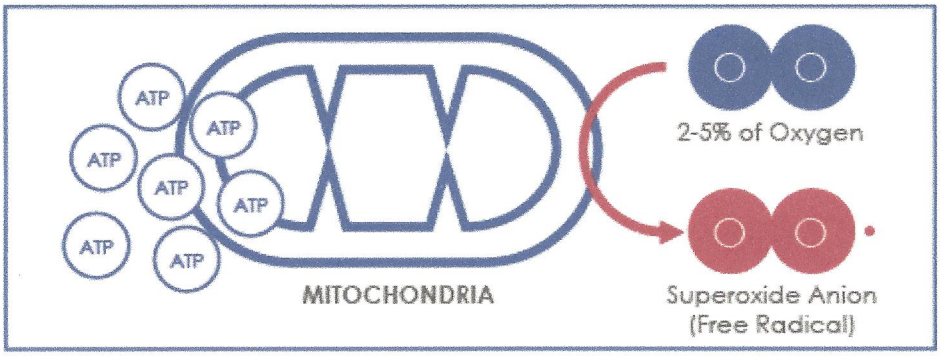
In this article we will go over the importance of having a strong antioxidant defense system and the ways that molecular hydrogen can support your cells and your overall health.

THERE'S A WAR WAGING WITHIN YOUR CELLS



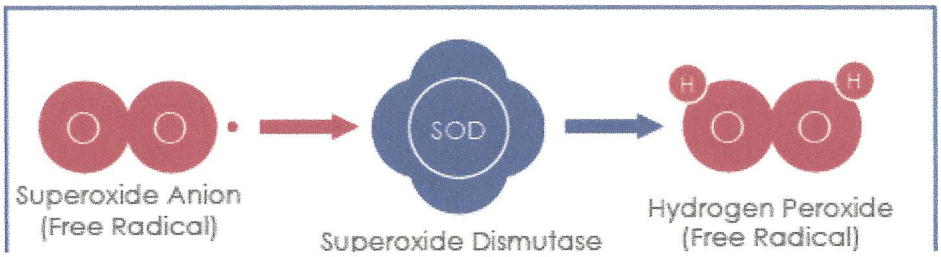
Your cells are constantly under attack by free radicals. Free radicals are byproducts of energy production from your mitochondria, the engines of your cells. Free radicals are very reactive, and if left alone can damage healthy molecules inside your cells. Normally, your antioxidant defense system can take care of free radicals before they inflict any harm.

FREE RADICALS ARE CONSTANTLY PRODUCED IN YOUR MITOCHONDRIA



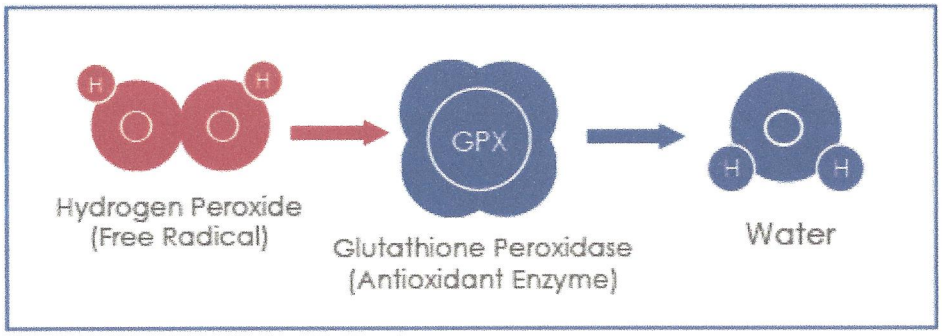
Mitochondria are responsible for producing energy in the form of ATP, but they also produce free radicals as a byproduct. Oxygen is critical in driving energy production. Unfortunately, 2-5% of the oxygen utilized in energy production convert into Free Radicals called Superoxide Anions.

ANTIOXIDANTS PROTECT YOUR CELLS FROM FREE RADICAL DAMAGE



(Antioxidant Enzyme)

Within your cells there are antioxidant enzymes such as Superoxide Dismutase that neutralizes Superoxide Anions into Hydrogen Peroxide. Hydrogen Peroxide is a weaker free radical that is useful in your cells. For example, it is used by your immune system to kill bacteria.



Another antioxidant enzyme is Glutathione Peroxidase. This antioxidant converts hydrogen peroxide into water. A strong antioxidant system is a very important part of having healthy cells because free radicals are constantly generated inside your cells.

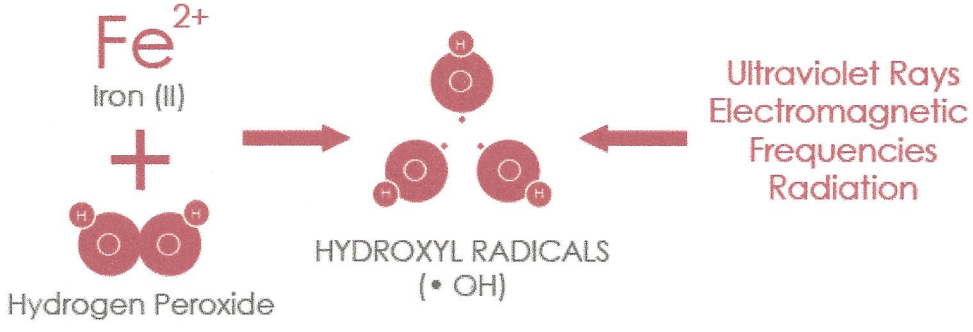
Neutralizing free radicals such as superoxide anion into water is a two step process. It's very important that an abundance of antioxidants such as Superoxide Dismutase and Glutathione Peroxidase are available to quickly and efficiently neutralize free radicals. However, depending on your diet, lifestyle, and environment, your cells can create more free radicals than your antioxidant enzymes can handle. When excess free radicals are formed inside your cells, it can result in serious consequences for your health.

EXCESS FREE RADICALS ARE DANGEROUS TO YOUR CELLS

Unhealthy lifestyle, bad environment, and poor nutrition contributes to excess free radical production in your cells. Also, as you age, your antioxidant defense system weakens, leaving you more vulnerable to free radical damage. Below are the most common contributors to producing excess free radicals inside your cells.

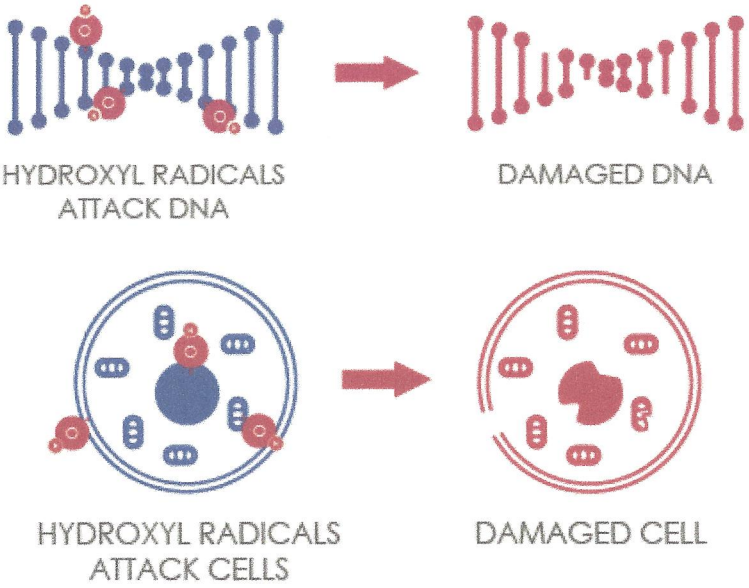
Radiation, Pollution, UV Rays, Processed Food, Drugs, Alcohol, Smoking, Household and Industrial Chemicals, Heavy Metals, Excessive Exercise, Lack of sleep, Stress, Mold, Bacteria, Viruses, Toxins, Injuries, EMF.

When excess free radicals are produced inside the cells, some of them can convert into more dangerous free radicals. For example, hydrogen peroxide readily converts into the most dangerous hydroxyl radicals in the presence of Iron(II) or other heavy metals. Another example is when your cells are subjected to radiation, UV rays, and Electromagnetic frequencies (EMF) these can directly produce hydroxyl radicals inside your cells.



Hydroxyl radicals are highly reactive free radicals that will steal

an electron from any other molecule, including DNA, Protein, Lipids, etc. thereby damaging them.



Once free radicals convert into hydroxyl radicals, there are no antioxidant enzymes that can neutralize them. Hydroxyl radicals will quickly react with and damage nearby molecules.

FREE RADICAL DAMAGE IN YOUR CELLS IS CALLED OXIDATIVE STRESS

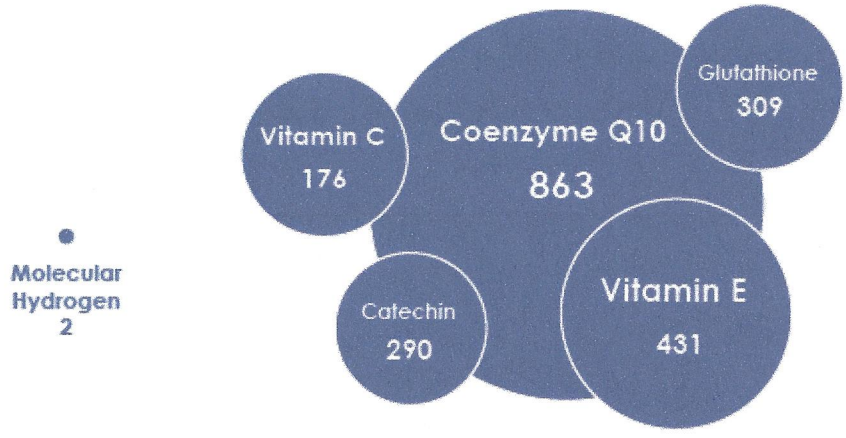
Oxidative stress occurs when there is a disturbance in the balance of free radicals and antioxidants. Oxidative stress is known as the cause of many different health challenges andit affects each individual differently depending on genetics, environment, and diet.

If you feel that you're not as healthy as you should be, it's most likely due to oxidative stress. You need to boost your antioxidant

defense system so that it can become balanced with free radical production. Many supplement companies claim that their antioxidant formula is the best. Although some of these formulas are effective, none of them have the ability to act in the multiple ways that Molecular Hydrogen does inside your cells.

HOW IS MOLECULAR HYDROGEN (H2) THE BEST ANTIOXIDANT?

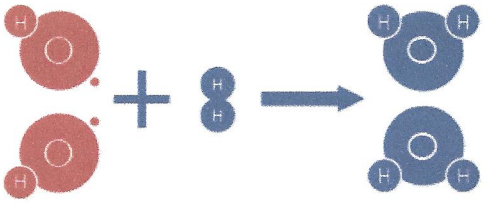
H2 is the smallest antioxidant in existence. Other antioxidants such as Vitamin C or Vitamin E are very large molecules compared to H2 and need to go through your digestive tract, absorbed in your intestines, go through your blood, and enter into your cells before they can eliminate free radicals. H2 is so small that it can penetrate through your stomachlining to begin acting inside your cells immediately. H2 is also in a gaseous state, so it can basically float through your cells and perform its function as an antioxidant.



Relative Sizes of Antioxidants

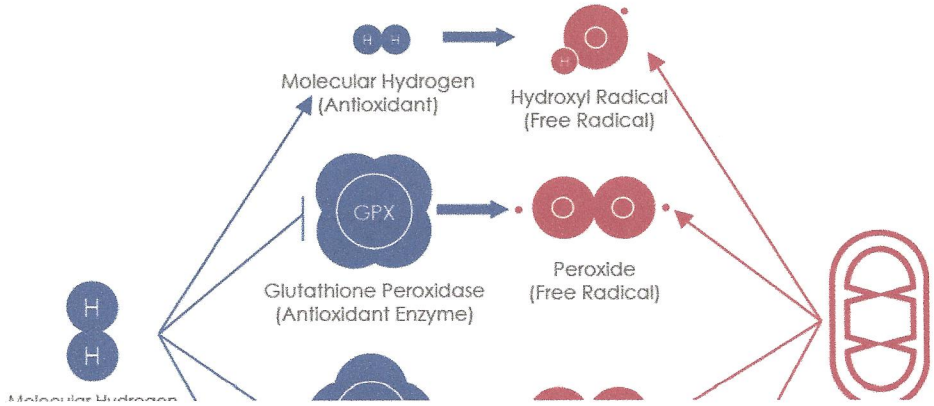
Each molecule of H2 can neutralize two hydroxyl radicals into

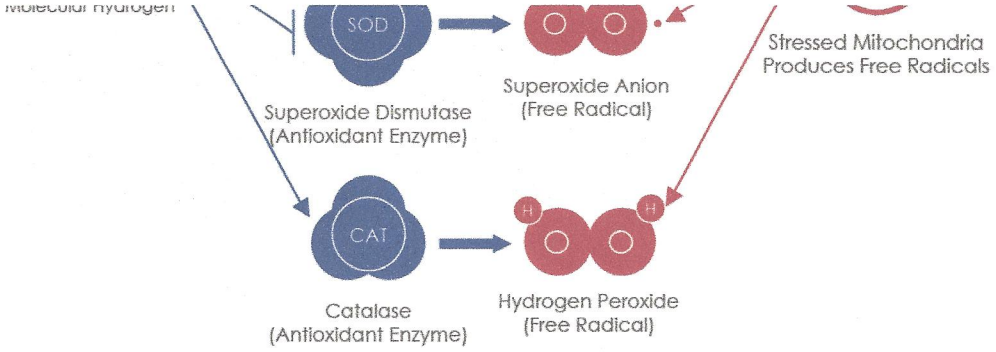
water, hydrating your cells in the process. H2 is selective and targets only hydroxyl radicals. This is a key benefit of H2 because H2 only eliminates the harmful free radicals but does not directly affect useful free radicals such as hydrogen peroxide or nitric oxide. Other antioxidants are not selective but rather neutralize any free radical in their vicinity. This may disrupt the balance of free radicals to antioxidants. Other antioxidants become weak free radicals themselves after neutralizing free radicals.(Source)



H2 Neutralizes Two Hydroxyl Radicals Into Two Water Molecules

Molecular Hydrogen not only neutralizes hydroxyl radicals directly, it helps enhance your antioxidant enzymes such as glutathione peroxidase, superoxide dismutase, and catalase. Each specific antioxidant enzyme and molecular hydrogen itself take care of different types of free radicals. All of these antioxidant enzymes work together to ensure there are no excess free radicals that can cause oxidative stress inside your cells.(Source)





Enhancing the antioxidant defense of your cells will help you deal with the excess free radicals caused by a variety of different factors in your life. Whether you live in a bad environment, eat nutrient deficient foods, or live a stressful life, you can keep optimal health by enhancing your antioxidant defense system.

Sometimes, it's hard to break out of the vicious cycle of unhealthiness. Take advantage of what molecular hydrogen can do for your health. Once you start to become healthy and have more energy, you can make more deliberate choices in improving your health.