6 - Potential usefulness of molecular hydrogen

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Convergent scientific reports have concluded that hydrogen has the capability to have an effective action at the cellular level. It is able to cross the blood brain barrier, to enter the mitochondria, and can translocate to the nucleus. Previous studies have shown that hydrogen exerts antioxidant, anti-apoptotic, anti-inflammatory, and cytoprotective properties that are beneficial to the cell.

There is no confirmed toxicity of hydrogen. Studies have assessed that consumption of hydrogen reduces oxidative stress in a diverse range of disorders and organ systems. Many publications have showed the potential usefulness of molecular hydrogen in the protection against side effects of radiation exposure. Moreover, it can provide a better quality of live for people treated by radiotherapy and in many other situations. Acute oxidative stress induced by ischemia-reperfusion or inflammation causes serious damage to tissues, and persistent oxidative stress is recognized as one of the causes of many diseases including cancer.

Hydrogen selectively reduces the hydroxyl radical, the most cytotoxic of reactive oxygen species (ROS) and effectively protected cells; however, hydrogen does not react with other ROS which possess physiological roles. ROS are involved in metastatic processes including invasion of cancer cells into surrounding primary tumor sites. Hydrogen is an antioxidant. It gives up electrons to hydroxyl radicals, witch stabilizes them and stops them in their tracks. Hydrogen has also beneficial effects on gene expression. It suppresses TNF-alpha and other proteins involved in inflammation and turns on mechanisms that protect against cell death. It does not scavenge essential redox signalling radicals that play a key role as cellular messengers.

The antioxidant advantages of hydrogen included high biomembrane penetration and intracellular diffusion capability which enable it to reach subcellular compartments and selectively scavenging the deleterious hydroxyl radical while preserving other important reactive oxygen and nitrogen species for normal signaling regulation.

7 - An antagonistic antibody of the chemokine receptor CCR4 reverses the tumor-promoting microenvironment of renal cancer

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The tumor microenvironment expresses chemokine networks that modulate the phenotype of the host infiltrate. Additionally, malignant cells often gain expression of functional