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# Hydrogen-rich pure water prevents superoxide formation in brain slices of vitamin C-depleted SMP30/GNL knockout mice

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## Abstract

Hydrogen is an established anti-oxidant that prevents acute oxidative stress. To clarify the mechanism of hydrogen's effect in the brain, we administered hydrogen-rich pure water (H<sub>2</sub>) to senescence marker protein-30 (SMP30)/gluconolactonase (GNL) knockout (KO) mice, which cannot synthesize vitamin C (VC), also a well-known anti-oxidant. These KO mice were divided into three groups; recipients of H<sub>2</sub>, VC, or pure water (H<sub>2</sub>O), administered for 33 days. VC levels in H<sub>2</sub> and H<sub>2</sub>O groups were <6% of those in the VC group. Subsequently, superoxide formation during hypoxia-reoxygenation treatment of brain slices from these groups was estimated by a real-time biography imaging system, which models living brain tissues, with Lucigenin used as chemiluminescence probe for superoxide. A significant 27.2% less superoxide formed in the H<sub>2</sub> group subjected to ischemia-reperfusion than in the H<sub>2</sub>O group. Thus hydrogen-rich pure water acts as an anti-oxidant in the brain slices and prevents superoxide formation.

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