Hydrogen-Rich Water as a Novel Therapeutic Strategy for the Affective Disorders Linked with Chronic Neuropathic Pain in Mice

🎯 Purpose
To explore the effects of HRW treatment in mice with neuropathic pain induced by chronic constriction of the sciatic nerve (CCI) and the accompanying affective deficits, including the pathways involved in HRW's analgesic activity and the interaction between heme oxygenase 1 (HO-1) and H_2 during neuropathic pain.

🐭 Model
Animal study — male mice. The treatment was administered by injection; oral administration routes are planned for future studies.

📊 Key Results
The study showed five key findings: HRW inhibited allodynia and hyperalgesia caused by sciatic nerve constriction; HRW produced anxiolytic and antidepressant effects in animals with neuropathic pain; antioxidant enzymes (HO-1 and NQO1) and ATP-sensitive potassium channels contributed to HRW's pain-relieving activity; a positive interaction was found between the HO-1 and H_2 systems in inhibiting CCI-induced neuropathy; and HRW demonstrated antioxidant, antinociceptive, anti-inflammatory, and antiapoptotic properties.

🔬 Mechanisms Identified
The antioxidant enzymes HO-1 and NQO1 and ATP-sensitive potassium channels contribute to HRW's painkiller activities, and there is a positive interaction between the HO-1 and H_2 systems in controlling neuropathy. PubMed

💡 Conclusion & Next Steps
The results point to HRW as a very promising candidate for the treatment of neuropathic pain and associated emotional disorders, due to its analgesic, anti-inflammatory, anxiolytic, and antidepressant properties. The next steps will be to investigate how the treatment works in animal models of pain associated with chemotherapy, as well as evaluating its effects on memory and emotional deficits.

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