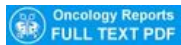


FULL TEXT LINKS



[Oncol Rep.](#) 2010 Dec;24(6):1463-70. doi: 10.3892/or_00001006.

Antitumor effects of nano-bubble hydrogen-dissolved water are enhanced by coexistent platinum colloid and the combined hyperthermia with apoptosis-like cell death

Ryoko Asada ¹, Katsuhiko Kageyama, Hiroshi Tanaka, Hisakazu Matsui, Masatsugu Kimura, Yasukazu Saitoh, Nobuhiko Miwa

Affiliations

PMID: 21042740 DOI: [10.3892/or_00001006](#)

Abstract

In order to erase reactive oxygen species (ROS) related with the proliferation of tumor cells by reducing activity of hydrogen, we developed functional water containing nano-bubbles (diameters: <900 nm for 71%/population) hydrogen of 1.1-1.5 ppm (the theoretical maximum: 1.6 ppm) with a reducing ability (an oxidation-reduction potential -650 mV, normal water: +100-200 mV) using a microporous-filter hydrogen-jetting device. We showed that hydrogen water erased ROS indispensable for tumor cell growth by ESR/spin trap, the redox indicator CDCFH-DA assay, and was cytotoxic to Ehrlich ascites tumor cells as assessed by WST-8 assay, crystal violet dye stain and scanning electron microscopy, after 24-h or 48-h incubation sequent to warming at 37°C or 42°C. Hydrogen water supplemented with platinum colloid (0.3 ppm Pt in 4% polyvinylpyrrolidone) had more antitumor activity than hydrogen water alone, mineral water alone (15.6%), hydrogen water plus mineral water, or platinum colloid alone as observed by decreased cell numbers, cell shrinkage and pycnosis (nuclear condensation)/karyorrhexis (nuclear fragmentation) indicative of apoptosis, together with cell deformation and disappearance of microvilli on the membrane surface. These antitumor effects were promoted by combination with hyperthermia at 42°C. Thus, the nano-bubble hydrogen water with platinum colloid is potent as an anti-tumor agent.

Related information

[MedGen](#)

[PubChem Compound \(MeSH Keyword\)](#)

LinkOut - more resources

Full Text Sources

[Ingenta plc](#)

[Spandidos Publications](#)

Other Literature Sources

[The Lens - Patent Citations](#)

Miscellaneous

[NCI CPTAC Assay Portal](#)