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On the antitumor properties of biomedical magnesium metal

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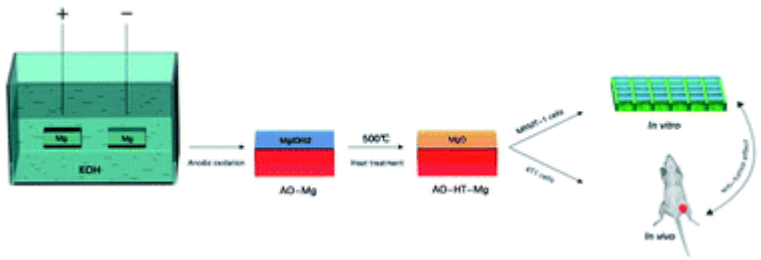
Abstract

H_2 is a therapeutic agent for tumors because it could scavenge free radicals, which is one of the causes for this disease in the human body. Biomedical magnesium (Mg) could release H_2 in the biodegradation process, thus it might have antitumor properties. In this study, Mg metal (P-Mg) was subjected to anodic oxidation plus heat treatment to get AO-HT-Mg covered with MgO. In SBF experiments AO-HT-Mg showed bioactivity as it could induce calcium phosphate deposition. The MgO layer played a protective role in the biodegradation process and controlled the H_2 releasing rate. In MRMT-1 rat breast carcinoma cell culture experiments, both P-Mg and AO-HT-Mg could inhibit free radical expression in the cells, and AO-HT-Mg showed higher inhibiting ability. In the animal experiments with 72 mice divided into 4 groups, both P-Mg and AO-HT-Mg could inhibit tumor growth. After implantation in the animals, P-Mg showed higher inhibiting ability at the initial stage, and AO-HT-Mg showed higher inhibiting ability after 26 days. The tumor inhibiting properties depended on H_2 releasing rates. The results confirm Mg metal has antitumor properties *in vivo*, and it is possible to optimize its antitumor properties by surface modification.



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