Antitumor effect of radiosensitive microcapsules under subcutaneous injection

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Abstract

Since 2004, we reported the use of liquid-core microcapsules for anticancer drug targeting. However, rupturing of microcapsules via radiation was lower than we expected. The more efficient rupturing of microcapsules by radiation was needed. In this study, we tested whether radiation-induced O_2 from H_2O_2 facilitate the rupturing of microcapsules, or not.

The capsules were generated by spraying a mixture of 2.0% hyaluronic acid, 2.0% alginate, supplemented with 0.2 mmol carboplatin and 3 % H_2O_2 on mixture of 0.5 mol/L $CaCl_2$ and$FeCl_2$. Resulting microcapsules were irradiated by ^{60}Co γ ray at doses ranging from 0.5 to 2.5Gy. The released carboplatin was detected and quantified by particle-induced X-ray emission.

The antitumor effect was measured by growth delay. The strength of adverse effect was measured basing on fuzzy hair, loss of body weight and death.

The radiation-induced O_2 from H_2O_2 significantly increased rupturing of microcapsules. Those increased the intratumoral concentration and antitumor effect of carboplatin; however they were not significant.

Our microcapsules should be more improved to increase radiation-induced rupturing.