Improved rupturing of irradiated microcapsules, using O_2 generation by redox reaction of L-ascorbic acid (AA) by radiation, and targeted anticancer drug using those microcapsules

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Abstract

This study was to determine whether redox reaction of L-ascorbic acid by irradiation could generate oxygen and increase rupturing of irradiated microcapsule. The microcapsules were generated by spraying a mixture of 0.1% alginate, hyaluronic acid, and10% L-ascrobic acid (AA) into a 0.3 mmol/l -solution of $CaCl_2$ and $FeCl_2$. A 1.0 x 10^{10} / 1ml solution of microcapsules were irradiated, and oxygen concentration and rupturing of microcapsules were measured. We showed that the redox reaction of AA generated oxygen, which increased rupturing of microcapsules. We also showed the increased concentration of anticancer drug when they were subucutaneously injected around the MM4 tumors (mice breast cancer), which were inoculated in the left hind legs of C3He/N mice.