Innovation of the high radiosensitive mirocapsules

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Abstract

Since 2004, we reported the use of liquid-core microcapsules for anticancer drug targeting. In this study, we report the improved releasing of liquid core microcapsules via radiotherapy by Fe polymerization of alginate.

The capsules were generated by spraying a mixture of 2.0% hyaluronic acid, 2.0% alginate, supplemented with 0.2 mmol carboplatin 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 accuracy of PIXE was tested by colorimetric assay of indocyanine green.

The generated microcapsules were 20.3 ± 3.8 μmϕ in size, with a liquid core of 19.7 ± 1.2 μmϕ. There were good agreements in the released liquid core between colorimetric assay using indocyanine green and carboplatin using PIXE. The releasing of liquid core of microcapsules increased dependently upon radiation dose. The released carboplatin was over 2μg with more than 2Gy irradiation, which were sufficient doses of carboplatin and radiation therapy.

Our microcapsules might lead to the new targeted chmeoradiotherapy.