Target chemotherapy by radiation

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Abstract

Introduction: The two methods to localize the distribution of carboplatin by radiation were tested basing on the PIXE study; 1) the facilitating the uptake of carboplatin by radiation; and 2) liquid core microcapsule that emit the carboplatin by radiation, IN VITRO.

Materials and Method : 1)Facilitating the uptake of carboplatin by radiation; the human leukemic cell, OCI/M2 was irradiation by the single dose of 0.5 or 2 Gy of ^{60}Co γ ray was irradiated. After 3, 6, 9, 12, and 24 hours of radiation, the kinetics of carboplatin was observed and measured by detecteting the Pt signal using PIXE.

2) Liquid core microcapsule that emit the carboplatin by radiation: The capsules were prepared by spraying the mixture of 0.3 % hyaluronic acid and 0.2 % alginate, supplemented with the 300 μg of catboplatin, into the 0.34 mMOL of $CaCl_2$. To those capsules, the 2, 5, or 10 Gy of ^{60}Co γ ray was irradiated. The emission of carboplatin was tested by detecting the Pt signal using PIXE.

Results and Discussion: The 0.5 or 2 Gy irradiation significantly increased the uptake of carboplatin on 12 hours after irradiation. The microcapsule emitted the carboplatin. The maximum emission rate was 16.4 % in 10 Gy irradiated capsules on 30 minutes after irradiation. Those phenomena resulted in localizing the carboplatin to the radiation filed. It is considered that the radiation has potential to localize the distribution of carboplatin by using those two methods.