



Targeting of anticancer drugs using liquid core microcapsules via radiotherapy

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The technical advance of radiotherapy enabled us to optimize the radiation field to the tumor at our will. If the capsule that release anticancer medicine by radiation can be innovated, the optimized radiation field will localize the anticancer medicine to the tumor. In addition if the released anticancer drugs have synergistic effect with radiation, increased anticancer effect will be brought about via synergism with anticancer medicine and radiation, and adverse effect of anticancer medicine will be decreased by its localization.

Since 2005, we have been developing microcapsules that release anticancer drugs during radiotherapy and anticancer drug targeting. The capsules were generated by spraying a mixture of 3.0% hyaluronic acid and 2.0% alginate, supplemented with 0.3% H₂O₂, 0.2 mmol of carboplatin, and 0.5 mol/l FeCl₂ and CaCl₂. Using these microcapsules, two types of anticancer drug targeting were tested.

Type 1: The microcapsules are subcutaneously injected in the area surrounding the tumor, followed by delivery of radiations. The irradiated microcapsules release anticancer drug (carboplatin).

Type 2: The first radiation was given to the area where we want to deliver drugs. The first radiation induce P-selectin antigen. The capsules that are labeled with FcSV antibody of P-selectin are gathered by radiation-antigen (P-selectin) guided accumulation. The accumulated microcapsules were irradiated by second radiation and release anticancer drug (carboplatin).

These two types of microcapsules targeted the anticancer drugs.

The targeted anticancer drugs (carboplatin) along with radiation synergistically acted against the tumor, resulting in increased antitumor activity. Localization of anticancer drugs by using microcapsules decreased the adverse effects of anticancer drugs.

Biography

Satoshi Harada got Japanese MD license at age of 25 and completed Phd at the age of 29 from postdoctoral studies from Iwate Medical University, School of Medicine. He is a assistant professor of Iwate Medical University, School of Medicine, Department of Radiology. He wrote more than 25 papers.