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Potential new technique for anticancer radiotherapy could provide alternative to brachytherapy

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A promising new approach to treating solid tumors with radiation was highly efficacious and minimally toxic to healthy tissue in a mouse model of cancer, according to data published in *Cancer Research*, a journal of the American Association for Cancer Research.

Some patients with solid tumors, including prostate cancer, are treated using a clinical technique called brachytherapy. Brachytherapy involves the surgical implantation of radioactive "seeds" within a patient's tumor to expose the tumor cells to high levels of radiation while minimizing the negative side effects of radiation on the rest of the body.

"The use of brachytherapy is limited by several factors," said Wenge Liu, M.D., Ph.D., associate research professor of biomedical engineering at Duke University in Durham, N.C. "The most prominent factor is the need for surgical implantation and removal of the seeds. We set out to develop an alternative approach to brachytherapy that would eliminate the need for surgery."

Liu and his colleagues generated an injectable substance, called a polymer, attached to a source of radioactivity that spontaneously assembled into a radioactive seed after being injected into a tumor.

In all mice transplanted with either a human head and neck cancer cell line or a human prostate cancer cell line, injection of the radioactive

polymers into the growing tumors substantially delayed tumor growth. In more than 67 percent of the animals, the tumors were eradicated by a single injection. Further analysis indicated no signs that cells outside the tumor had been exposed to significant amounts of radiation in any of the animals injected with the radioactive polymers.

"We believe that this approach provides a useful alternative to existing brachytherapy, which requires a complicated surgical procedure to implant the radioactive seeds," Liu said. "Moreover, these injectable seeds degrade after the radiation is exhausted, so they do not need to be surgically removed."

Provided by American Association for Cancer Research