

Researchers find molecule that targets brain tumors

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UC Davis Cancer Center researchers report today the discovery of a molecule that targets glioblastoma, a highly deadly form of cancer. The finding, which is published in the January 2009 issue of the *European Journal of Nuclear Medicine and Molecular Imaging*, provides hope for effectively treating an incurable cancer.

Glioblastoma is the most common and aggressive type of primary brain tumor in adults. It is marked by tumors with irregular shapes and poorly defined borders that rapidly invade neighboring tissues, making them difficult to remove surgically.

"These brain tumors are currently treated with surgery to remove as much of the tumor as possible followed by radiation to kill cancer cells left behind and systemic chemotherapy to prevent spread to nearby tissues," said Kit Lam, senior author of the study and UC Davis chief of hematology and oncology. "It is unfortunate that this approach does not extend survival significantly. Most patients survive less than one year."

To find new options for treating the disease, Lam and his colleagues began searching for a molecule that could be injected into a patient's bloodstream and deliver high concentrations of medication or radionuclides directly to brain tumor cells while sparing normal tissues. Through their study, they identified a molecule — called LXY1 — that binds with high specificity to a particular cell-surface protein called alpha-3 integrin, which is overexpressed on cancer cells.

They also tested the molecule's ability to target brain cancer by implanting human glioblastoma cells both beneath the skin and in the brains of mice. The researchers injected the mice with a radiolabeled version of LXY1 and, using near-infrared fluorescence imaging, showed that the molecule did preferentially bind to human glioblastoma cells in both locations.

"This outcome gives us great hope that we will be able to deliver targeted therapies to treat glioblastoma," said Lam.

Lam is planning to continue this work by repeating the experiments with powerful cancer treatments linked to the LXY1 molecule. They will begin with iodine-131, a form of radionuclide currently used to treat some cancers, as well as a nanoparticle, or "smart bomb," that would carry cancer-fighting drugs to diseased cells.

Source: University of California - Davis

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