PENN CENTER FOR INNOVATION
Empowering Ideas

Novel Radiation Sensitizers for Cancer Treatment

Radio-sensitizing compounds for glioblastoma and other solid cancer

Inventor

Costas Koumenis

STAGE OF DEVELOPMENT

In vitro and *in vivo* data

INTELLECTUAL PROPERTY

Issued US patent 8,541,476

REFERENCE MEDIA

Cancer Res 2007; 67: (18)

DESIRED PARTNERSHIPS

- Exclusive License
- Co-development

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Linara Axanova
axanova@upenn.edu
215-573-3445

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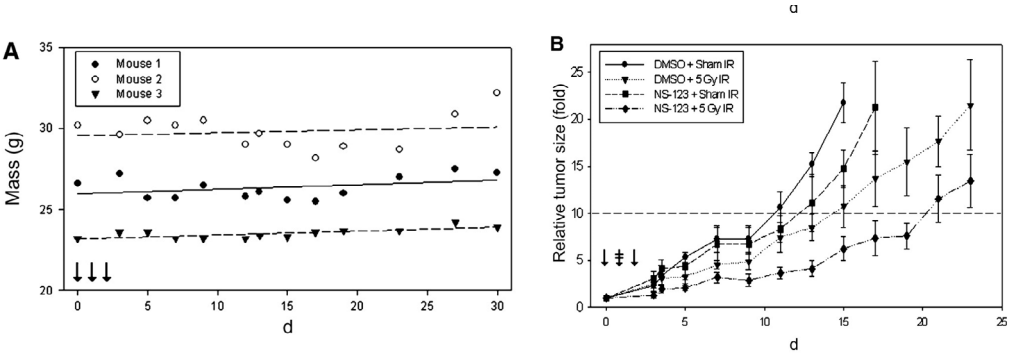
Problem

Glioblastoma Multiforme (GBM), the most common primary brain tumor in adults, is an aggressive and locally invasive tumor. Despite advances in surgery, radiotherapy, and chemotherapy, overall survival of patients affected by GBM has only marginally increased from 6 to 14 months in recent decades. Use of conventional radiotherapy for treatment of GBM is limited by the dosage levels that can be applied to the tumor region without destabilizing the healthy neighboring cells. The efficiency of the treatment can be improved using radiation sensitizers that enhance the cytotoxic effects of radiations on the glioma cells, leading to improved therapeutic results.

Solution

The Koumenis lab at UPenn have devised a cell-based screening approach to identify novel radio-sensitizing compounds for GBM. Using a high throughput, unbiased screening approach, the inventors have identified 4'-bromo-3'-nitropropiophenone (NS-123) and 4'-bromo-3'-nitrobenzonitrile (NS-160) as photosensitizers of human glioma cells but not normal cells. In vitro, the use of NS-123 significantly enhanced the tumor growth-inhibitory effects of ionizing radiations in glioma cells, colorectal carcinoma cells, and lung adenocarcinoma cells. Similar results were also observed in vivo. Furthermore, the screening assay used to identify the radio-sensitizer compound can also be applied to identify suitable radio-sensitizing compounds for other types of cancers.



Advantages

- Enhanced efficacy of radiation therapy for GBM
- Reduction of the required dosage levels
- Low or no toxicity for healthy tissue