

## ABSTRACT

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Most recent update of preclinical and clinical data on radioresistance and radiosensitivity of high-grade gliomas-a radiation oncologist's perspective.

Frosina G(1).

Author information:

(1)Mutagenesis & Cancer Prevention Unit, IRCCS Ospedale Policlinico San Martino, Largo Rosanna Benzi 10, 16132, Genova, Italy. [guido.frosina@hsanmartino.it](mailto:guido.frosina@hsanmartino.it).

**PURPOSE:** This review article discusses the studies concerning advances in radiotherapy of high-grade gliomas published in the second half of 2021.

**METHODS:** A literature search was performed in PubMed using the terms ("gliom\* and radio\*") and time limits 1 July 2021-31 December 2021. The articles were then manually selected for relevance to the analyzed topics.

**RESULTS:** Considerable progress has been made in the preclinical field on the mechanisms of radioresistance and radiosensitization of high-grade gliomas (HGG). However, fewer early-phase (I/II) clinical trials have been performed and, of the latter, even fewer have produced results that justify moving to phase III. In the 6-month period under consideration, no studies were published that would lead to a change in clinical practice and the overall survival (OS) of patients remained similar to that of 2005, the year in which it increased significantly for the last time thanks to introduction of the alkylating agent temozolomide.

**CONCLUSION:** After 17 years of stalemate in improving the OS of patients with HGG, an in-depth analysis of the causes should be carried out in order to identify whether the research efforts conducted so far, including in the radiotherapeutic field, have been the most effective or require improvement. In our opinion, in addition to the therapeutic difficulties related to the biology of HGG tumors (e.g., high infiltrating capacity, multiple resistance mechanisms, blood-brain barrier), some public research policy choices may also play a role, especially in consideration of the limited interest of the pharmaceutical industry in the field of rare cancers.

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