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DNA repair and resistance of gliomas to chemotherapy and radiotherapy.

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Abstract

The importance of DNA repair as a resistance mechanism in gliomas, the most aggressive form of brain tumor, is a clinically relevant topic. Recent studies show that not all cells are equally malignant in gliomas. Certain subpopulations are particularly prone to drive tumor progression and resist chemo- and radiotherapy. Those cells have been variably named cancer stem cells or cancer-initiating cells or tumor-propagating cells, owing to their possible (but still uncertain) origin from normal stem cells. Although DNA repair reduces the efficacy of chemotherapeutics and ionizing radiation toward bulk gliomas, its contribution to resistance of the rare glioma stem cell subpopulations is less clear. Mechanisms other than DNA repair (in particular low proliferation and activation of the DNA damage checkpoint response) are likely main players of resistance in glioma stem cells and their targeting might yield significant therapeutic gains.

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