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1: [Cell Physiol Biochem.](#) 2008;22(5-6):757-68. Epub 2008 Dec 9. Related Articles,  
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**Differences in mitochondrial function and antioxidant systems between regions of human glioma.**

[Santandreu FM](#), [Brell M](#), [Gene AH](#), [Guevara R](#), [Oliver J](#), [Couce ME](#), [Roca P](#).

Departament de Biologia Fonamental i Ciències de la Salut, Grup de Metabolisme Energètic i Nutrició, Institut Universitari d'Investigació en Ciències de la Salut, Universitat de les Illes Balears, Palma de Mallorca, Spain.

Metabolic features and oxidative stress have been extensively studied in cancer cells. However, comparative studies between cancer cell populations that coexist in human neoplastic tissue are not frequently available. The aim of the present study was to characterize markers of oxidative status and mitochondrial function in center vs. periphery of human fresh glioma samples; therefore, antioxidant systems, oxidative stress and mitochondrial parameters were assessed in gross total resections of gliomas. Mitochondrial protein and mitochondrial DNA content, enzymatic activities of mitochondrial oxidative and phosphorylative system, antioxidant mechanisms, mitochondrial H(2)O(2) production, oxygen consumption and cellular oxidative damage were measured in human gliomas. Concentric regions of human glioma tissue showed similar mitochondrial structural markers; conversely, the functionality of their isolated mitochondria was significantly different. In this way, the tumor periphery exhibited higher respiratory rate and fewer antioxidant systems than tumor center. Our results have expanded previous investigations, which report the presence of cell populations with different oxidative susceptibility in human brain tumor samples. This is, to our knowledge, the first study to investigate metabolic differences in concentric regions of gross total resections of glioma. Interestingly, the cancer cell population that exhibits an increased antioxidant capacity within the tumor mass might be responsible for tumor resistance to chemotherapy and radiotherapy. Copyright 2008 S. Karger AG, Basel.

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