Alterations in DNA repair gene expression under hypoxia: elucidating the mechanisms of hypoxia-induced genetic instability. [1]

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Abstract

Hypoxia is a common feature of solid tumors and is associated with genetic instability and tumor progression. It has been shown previously that alterations in the expression of DNA repair genes in response to hypoxic stress may account for a proportion of such genetic instability. Here, we demonstrate that the expression of RAD51, a critical mediator of homologous recombination (HR), is repressed by hypoxia in numerous cell lines derived from a wide range of tissues. Repression of this gene by hypoxia occurs in a cell cycle- and hypoxia-inducible factor (HIF)-independent manner, and decreased RAD51 expression was observed to persist during the post-hypoxic period. In addition, decreases in Rad51 expression were correlated with functional impairments in HR repair in hypoxic and post-hypoxic cells. Based on these data, we propose a novel mechanism of hypoxia-induced genetic instability via suppression of the HR pathway in cancer cells within the tumor microenvironment.

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[1] https://www.cienciapr.org/es/alterations-dna-repair-gene-expression-under-hypoxia-elucidating-mechanisms-hypoxia-induced-genetic [2] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4036 [3] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4037 [4] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4038 [5] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4039 [6] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4040 [7] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4041 [8] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4034 [9] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4042 [10] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4043 [11] https://www.cienciapr.org/es/biblio?f%5Bauthor%5D=4044 [12] http://dx.doi.org/10.1196/annals.1339.049 [13] https://www.ncbi.nlm.nih.gov/pubmed/16382054?dopt=Abstract