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The origins of glioma: E Pluribus Unum?

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Abstract

Malignant glioma is among of the most devastating, and least curable, types of cancer. Since the re-emergence of the cancer stem cell hypothesis, much progress has been made towards elucidating the cellular origin of these tumors. The hypothesis that tumors are hierarchically organized, with a cancer stem cell at the top that shares defining features with somatic stem cells and provides therapeutic refractoriness properties, has put adult stem cells into the limelight as prime suspect for malignant glioma. Much confusion still exists, though, as to the particular cell type and processes that lead to oncogenic transformation. In this review, we will discuss recent developments and novel hypotheses regarding the origin of malignant gliomas, especially glioblastoma. In particular, we argue that glioblastoma is the result of different pathways originating in multiple sources that all ultimately converge in the same disease. Further attention is devoted to potential scenarios leading to transformation of different stem/progenitor cell types of the brain, and the probability and relevance of these scenarios for malignant tumorigenesis. © 2011 Wiley-Liss, Inc.

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