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Stem cells: implications in the development of brain tumors.

[Article in English, Spanish]

Matos Rojas IA, Bertholdo D, Castillo M.

Servicio de Radiodiagnóstico, Hospital Universitario La Paz, Madrid, España.

Abstract

Stem cells are characterized by their capacity for self-renewal, for giving rise to new cells in specific tissues, and for maintaining this capacity throughout the entire life of their host. Stem cells are pluripotent and maintain continuous production of neurons, astrocytes, and oligodendrocytes. Stem cells in brain tumors also proliferate, undergo self-renewal, and give rise to other poorly differentiated cells. Unlike non-tumor stem cells, tumor stem cells lack the normal mechanisms that regulate proliferation and differentiation, resulting in uncontrolled production and incomplete differentiation of tumor cells. Discovering the role of tumor stem cells in the brain has given us a new perspective about the molecular pathways involved in signaling and about oncogenesis in the central nervous system; it can also help us explain the high rate of recurrence of some tumors and the diffuse nature of glioblastomas. Ideally, this perspective can be expected to lead to better treatments. This article reviews the characteristics of non-tumor and tumor stem cells, emphasizing the importance of brain tumor stem cells in the pathogenesis of common brain tumors.

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