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## Mechanisms of immunomodulation in human glioblastoma.

Avril T, Vauleon E, Tanguy-Royer S, Mosser J, Quillien V.

Département de Biologie, Centre Eugène Marquis, Rue de la bataille Flandres Dunkerque, CS44229, 35042 Rennes cedex, France.  
t.avril@rennes.fnclcc.fr

### Abstract

Glioblastoma multiforme (GBM), WHO grade IV astrocytoma, is the most dramatic primary brain cancer with a very poor prognosis due to inevitable disease recurrence. Less than 10% of GBM patients are still alive 5 years after diagnosis despite a multimodal treatment with surgical resection of the tumor, radiation therapy and chemotherapy. Cellular immunotherapy in gliomas, one of the promising new therapies, has shown convincing results in some patients with induction of antitumor immune responses and prolonged survival. In particular, several patients treated with dendritic cell vaccinations have demonstrated systemic antigen-specific cytotoxicity and intratumor infiltration of cytotoxic T cells. However, this is not always correlated with clinical improvement because GBM cells have multiple mechanisms that lead to suppression of the patient's antitumor immune responses. This article will focus on some aspects of the systemic immunosuppression observed in GBM patients as well as the multiple mechanisms of local immunoresistance developed by GBM.

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