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Neuroplasticity in Diffuse Low-grade Gliomas: Backward Modelling of Brain-tumor Interactions Prior to Diagnosis is Needed to Better Predict Recovery after Treatment

Current Neurology and Neuroscience Reports

Aims and scope

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Abstract

Purpose of Review

In low-grade glioma (LGG), besides the patient's neurological status and tumor characteristics on neuroimaging, current treatment guidelines mainly rely on the glioma's genetics at diagnosis to define therapeutic strategy, usually starting with surgical resection. However, this snapshot in time does not take into account the antecedent period of tumor progression and its interactions with the brain before presentation. This article reviews new concepts that pertain to reconstruct the history of previous interplay between the LGG's course and adaptive changes in the connectome within which the glioma is embedded over the years preceding the diagnosis.

Recent Findings

Microscale and macroscale parameters helpful for extrapolating backward in time are considered,

both for the glioma (kinetics, migration vs. proliferation profile, metabolism with possible intratumoral heterogeneity, relationships with surrounding cerebral pathways) and for patterns of reconfiguration within and across neural networks in reaction to the LGG leading to considerable interindividual cerebral variability. Modelling these continuous variations at the time of LGG diagnosis is a prerequisite to predict recovery from treatment(s).

Summary

It is important to go beyond the biology of the LGG at a given moment of its history, and instead construct a more comprehensive picture of the past and present dynamics of glioma–brain interactions, and their ongoing evolution, as a necessary stage to optimize a personalized management plan by thinking several steps ahead.

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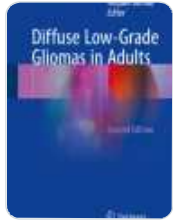**Log in via an institution**

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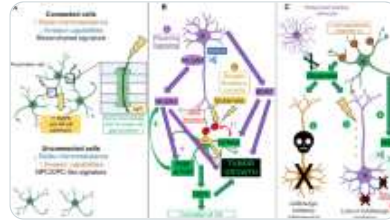
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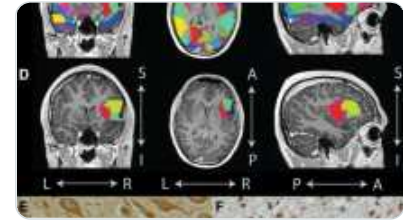### Similar content being viewed by others

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Data Availability

No datasets were generated or analysed during the current study.

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The future is a door, the past is the key (Victor Hugo).

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