PIK3R1

The PIK3R1 gene encodes the p85 α regulatory subunit of phosphoinositide 3-kinase (PI3K).

The p85 α regulatory subunit of PI3K helps to stabilize and regulate the activity of the catalytic subunit, which is responsible for phosphorylating phosphoinositide lipids, leading to the production of second messengers involved in cell signaling. PIK3R1 mutations or dysregulation can lead to abnormal PI3K signaling, which has been implicated in various diseases, including cancer, diabetes, and immune disorders.

Research into PIK3R1 and its role in various cellular processes and diseases is ongoing, and it represents an important target for therapeutic intervention in conditions where PI3K signaling is dysregulated. It's worth noting that the understanding of genes and their functions can evolve over time as new research findings emerge, so I recommend consulting the latest scientific literature for the most up-to-date information on PIK3R1.

The World Health Organization Classification of Tumors of the Central Nervous System 2021 defined astrocytoma IDH-mutant, Grade 4. However, the understanding of this subtype is still limited. Chen et al. conducted a study to describe the features of astrocytoma, IDH-mutant, and Grade 4, and explored the similarities and differences between histological and molecular subtypes.

Patients who underwent surgery from January 2011 to January 2022, classified as astrocytoma, IDHmutant, Grade 4 were included in this study. Clinical, radiological, histopathological, molecular pathological, and survival data were collected for analysis.

Altogether 33 patients with astrocytoma, IDH-mutant, Grade 4 were selected, including 20 with histological and 13 with molecular WHO Grade 4 astrocytoma. Tumor enhancement, intratumoral-necrosis-like presentation, larger peritumoral edema, and more explicit tumor margins were frequently observed in histological WHO Grade 4 astrocytoma. Additionally, molecular WHO Grade 4 astrocytoma showed a tendency for relatively longer overall survival, while a statistical significance was not reached (47 vs. 25 months, p = 0.22). TP53, CDK6, and PIK3CA alteration was commonly observed, while PIK3R1 (p = 0.033), Notch1 (p = 0.027), and Mycn (p = 0.027) alterations may affect the overall survival of molecular WHO Grade 4 astrocytomas.

The study scrutinized IDH-mutant, Grade 4 astrocytoma. Therefore, further classification should be considered as the prognosis varied between histological and molecular WHO Grade 4 astrocytomas. Notably, therapies aiming at PIK3R1, Notch 1, and Mycn may be beneficial ¹⁾.

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Chen W, Guo S, Wang Y, Shi Y, Guo X, Liu D, Li Y, Wang Y, Xing H, Xia Y, Li J, Wu J, Liang T, Wang H, Liu Q, Jin S, Qu T, Li H, Yang T, Zhang K, Wang Y, Ma W. Novel insight into histological and molecular astrocytoma, IDH-mutant, Grade 4 by the updated WHO classification of central nervous system tumors. Cancer Med. 2023 Sep 5. doi: 10.1002/cam4.6476. Epub ahead of print. PMID: 37667984.

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