

J Neuropathol Exp Neurol. 2025 Apr 16:nlaf039. doi: 10.1093/jnen/nlaf039. Online ahead of print.

Adult diffuse IDH-wildtype lower-grade gliomas with PDGFRA gain/amplification should be upgraded as glioblastoma

Yue Li^{1 2 3}, Xiujiiao Shen^{1 2 4}, Ji Zhang^{1 2 5}, Xinyi Xian^{1 2 4}, Shaoyu Chen⁶, Jing Zeng^{1 2 4}, Wanming Hu^{1 2 4}

Affiliations

PMID: 40238212 DOI: [10.1093/jnen/nlaf039](https://doi.org/10.1093/jnen/nlaf039)

Abstract

We explored the prognostic significance of platelet-derived growth factor receptor α (PDGFRA) gain/amplification in grade 2-4 adult gliomas to assess its value as an upgrading indicator. Fluorescence in situ hybridization was performed to detect PDGFRA gain/amplification in 321 glioma specimens from Sun Yat-sen University Cancer Center (SYSUCC). Data from 1934 cases with available next-generation sequencing results from The Cancer Genome Atlas (TCGA) and cBioPortal were also analyzed. Of the adult grade 2-4 gliomas, 12.15% (39/321), 8.76% (93/1062), and 6.88% (60/872) had PDGFRA gain/amplification in the SYSUCC, TCGA, and cBioPortal cohorts, respectively. Grade 4 glioblastomas had a greater PDGFRA gain/amplification rate than lower-grade gliomas (LGGs) in all cohorts (all $P < .05$). PDGFRA gain/amplification was associated with older age, greater World Health Organization grade, isocitrate dehydrogenase (IDH)-wildtype, intact 1p/19q, telomerase reverse transcriptase promoter-wildtype, greater Ki67 index, epidermal growth factor receptor amplification, and chromosome 7+/10- alterations. PDGFRA gain/amplification predicted poor overall survival (OS) in grade 2-4 gliomas, particularly IDH-wildtype LGGs, in all cohorts (all $P < .05$). OS was worse in PDGFRA-amplified IDH-wildtype LGGs than in IDH-wildtype glioblastomas in the cBioPortal ($P = .031$) and SYSUCC ($P = .026$) cohorts. PDGFRA gain/amplification predicted poor OS in adult diffuse IDH-wildtype LGGs and may serve as an upgrading indicator.

Keywords: FISH; IDH; PDGFRA; glioblastoma; lower-grade glioma (LGG); prognosis.

© The Author(s) 2025. Published by Oxford University Press on behalf of American Association of Neuropathologists, Inc. All rights reserved. For commercial re-use, please contact reprints@oup.com for reprints and translation rights for reprints. All other permissions can be obtained through our RightsLink service via the Permissions link on the article page on our site—for further information please contact journals.permissions@oup.com.

[PubMed Disclaimer](#)