p21-activated kinases

p21 activated kinases (PAKs) are members of a family of enzymes. They serve as targets for the small GTP binding proteins CDC42 and Rac and have been implicated in a wide range of biological activities.

The p21-activated kinases (PAK) family (PAKs) plays a key role in the formation and development of human tumors. However, a systematic analysis of PAKs in human cancers is lacking and the potential role of PAKs in cancer immunity has not been explored.

Lei et al. used datasets from The Cancer Genome Atlas (TCGA) database and Genotype-Tissue Expression database (GTEx).

Based on TCGA datasets most PAKs show noteworthy differences in expression between tumors and corresponding normal tissues or across different tumor tissues. Patients with high expression of PAKs often show a worse prognosis. However, copy number variation, mutation, and DNA methylation of PAKs have a limited impact on tumor development. Further analysis showed that the impact of PAKs on immunity varies with the type of tumor and the respective tumor microenvironment.

PAK1 and PAK4 may be stronger predictors of immune characteristics and are more suitable as drugs and molecular therapeutic targets. Furthermore, Cox regression analysis revealed that a PAK gene signature could be used as an independent prognostic factor for low-grade glioma (LGG) and glioblastoma (Glioblastoma). Gene set enrichment analysis (GSEA) analysis indicated that PAK genes may affect the occurrence and development of glioblastoma through the PI3K signaling pathway. Further experiments verified that PAK1 and AKT1 have a significant interaction in Glioblastoma cells, and inhibiting the overactivation of PAK1 can significantly inhibit the proliferation of Glioblastoma cells.

The study provides a rationale for further research on the prognostic and therapeutic potential of PAKs in human tumors [1)].

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