LKS Faculty of Medicine
Department of Surgery
香港大學外科學系

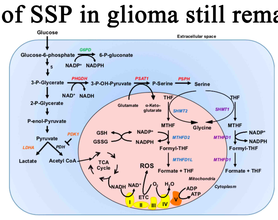
Phosphoserine phosphatase (PSPH) is up-regulated in glioma and predicts poor survival of glioma patients

JIN Lei[1], ZHU Zhiyuan[1], Yu Rutong[2,3], LEUNG Gilberto Ka Kit[1]

[1]Department of Surgery, Li Ka Shing Faculty of Medicine, the University of Hong Kong, Queen Mary Hospital, Hong Kong
[2]Institute of Nervous Systems Diseases, Xuzhou Medical University, Xuzhou 21002, Jiangsu, P.R. China
[3]Brain Hospital, Affiliated Hospital of Xuzhou Medical University, Xuzhou 221002, Jiangsu, P.R. China

Background

Recent cancer research attention has been redrawn to the field of cancer metabolism, of which the serine synthesis pathway (SSP) composed of three enzymes: phosphoglycerate dehrdrogenase (PHGDH), phosphoserine aminotransferase (PSAT1) and phosphoserine phosphatase (PSPH) has been reported to be critical for cancer cell proliferation andsurvival by providing one carbon for nucleotide synthesis and 40% NADPH for anti-oxidation in breast cancer and hepatocellular carcinoma. However, the roles of SSP in glioma still remain unelucidated.

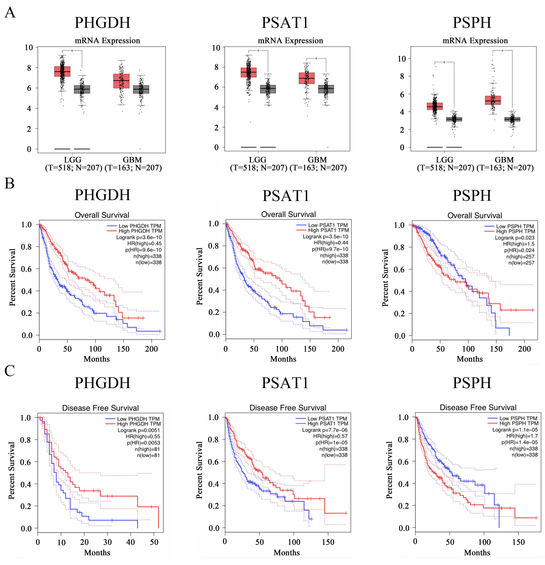


Materials and Methods

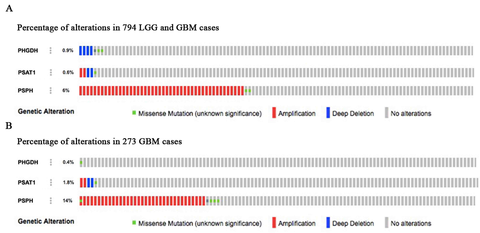
-- GEPIA TCGA database analysis- mRNA expression levels of SSP enzymes in normal brain tissue and gliomas
-- cBioPortal dataset analysis-genetic alterations of SSP enzymes in gliomas
-- Q-PCR, IHC and Western Blot- mRNA and protein expression levels of PSPH in nontumor and glioma specimens

Results

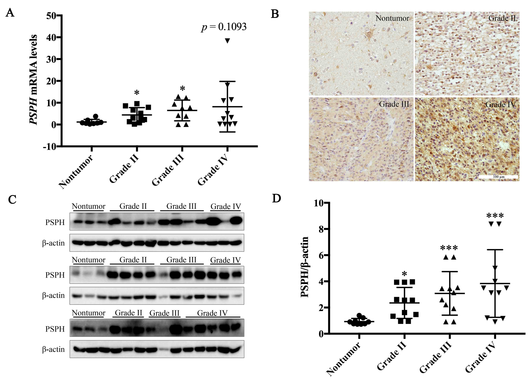
1. SSP pathway is highly activated in glioma and predicts both overall and disease-free survivals of glioma patients.



2. PSPH bears the highest ampplification percentage in glioma compared to the other two enzymes.



3. PSPH is up-regulated in both mRNA and protein levels in glioma.



Conclusions

The SSP pathway is highly activated in glioma while PSPH not only bears the highest amplification percentage but also predicts both overall and disease-free survivals of glioma patients, making it a promisin gprognostic biomarker for glioma.