The JAK-STAT signalling pathway is a chain of interactions between proteins in a cell and is involved in processes such as immunity, cell division, cell death and tumour formation. The pathway communicates information from chemical signals outside of a cell to the cell nucleus, resulting in the activation of genes through a process called transcription. There are three key parts of JAK-STAT signalling: Janus kinases (JAKs), signal transducer and activator of transcription proteins (STATs), and receptors (which bind the chemical signals).

Disrupted JAK-STAT signalling may lead to a variety of diseases, such as skin conditions, cancers, and disorders affecting the immune system.

A work aimed to research the function of MARVEL domain-containing protein 1 (MARVELD1) in glioma as well as its functioning mode. Bioinformatics analysis was utilized to assess the MARVELD1 expression in glioma tissues and its relationship with grade and prognosis, based on The Cancer Genome Atlas (TCGA), Genotype-Tissue Expression (GTEx), and Chinese Glioma Genome Atlas (CGGA) databases. Cell Counting Kit-8 (CCK-8), colony formation, and Transwell assays were carried out to determine the impact of MARVELD1 on malignant biological behavior of glioma, such as proliferation, invasion, and migration. qRT-PCR was carried out to test the mRNA level of MARVELD1. Western blot assay was performed to measure the protein expression of MARVELD1 and JAK/STAT pathway-related proteins. MARVELD1 was expressed at high levels in glioma tissues and cell lines. Kaplan-Meier survival analysis revealed that the higher MARVELD1 expression, the shorter the survival time of patients with glioma. Also, the MARVELD1 expression in WHO IV was significantly enhanced compared to that in WHO II and WHO III. Furthermore, the functional analysis of MARVELD1 in vitro revealed that knockdown of MARVELD1 in U251 cells restrained cell proliferation, migration, and invasion, while up-regulation of MARVELD1 in U87 cells presented opposite outcomes. Finally, we found that JAK/STAT signaling pathway mediated the function of MARVELD1 in glioma. MARVELD1 contributed to promoting the malignant progression of glioma, which is the key driver of activation of JAK-STAT signalling pathway in gliomas [1)].

1)
Xia L, Jin P, Tian W, Liang S, Tan L, Li B. Up-regulation of MARVEL domain-containing protein 1 (MARVELD1) accelerated the malignant phenotype of glioma cancer cells via mediating JAK/STAT signaling pathway. Braz J Med Biol Res. 2021 May 17;54(7):e10236. doi: 10.1590/1414-431X2020e10236. PMID: 34008750.