

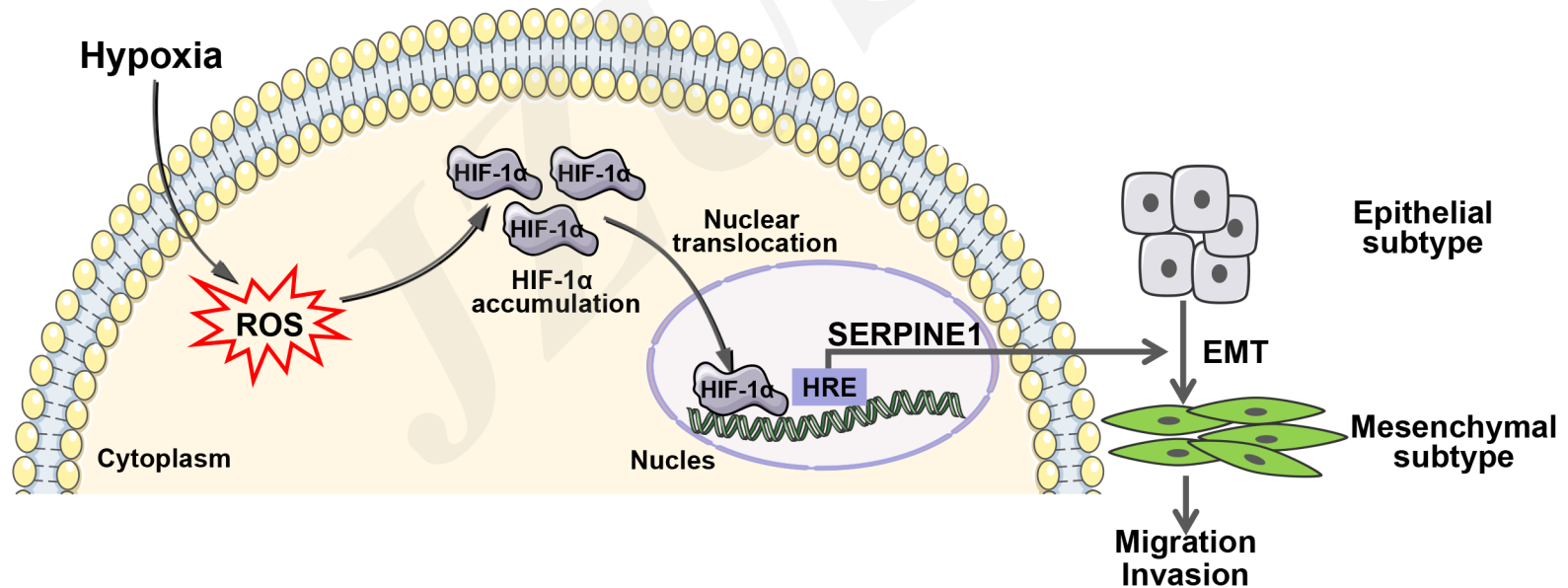
**Cite this as:** Lin ZHANG, Yuanyuan CAO, Xiaoxiao GUO, Xiaoyu WANG, Xiao HAN, Kouminin KANWORE, Xiaoliang HONG, Han ZHOU, Dianshuai GAO. Hypoxia-induced ROS aggravate tumor progression through HIF-1 $\alpha$ -SERPINE1 signaling in glioblastoma[J]. Journal of Zhejiang University Science B, 2023, 24(1): 32-49.  
<http://doi.org/10.1631/jzus.B2200269>

# **Hypoxia-induced ROS aggravate tumor progression through HIF-1 $\alpha$ -SERPINE1 signaling in glioblastoma**

**Key words:** Glioblastoma, Hypoxia, ROS, HIF-1 $\alpha$ , SERPINE1

# Research Summary

Hypoxia promotes the generation of reactive oxygen species (ROS) in glioblastoma (GBM) cells, and elevated ROS contribute to HIF-1 $\alpha$  accumulation and nuclear translocation. HIF-1 $\alpha$  upregulates SERPINE1 by binding to the hypoxia response element (HRE) of SERPINE1 promoter, thereby promoting GBM migration and invasion through epithelial-mesenchymal transition (EMT). ROS may be potential therapeutic targets of GBM.



# ***Innovation points***

**This study identified a feasible mechanism by which hypoxia contributes to GBM cell migration and invasion, and unraveled the vital roles of ROS-HIF-1 $\alpha$ -SERPINE1 pathway in GBM adaptation to hypoxic stress. The main findings are as follows:**

- Hypoxia-induced ROS enhance GBM progression**
- ROS accelerates hypoxia-promoted cell migration and invasion through activating HIF-1 $\alpha$  in GBM**
- HIF-1 $\alpha$  up-regulates SERPINE1 transcription in hypoxia**
- ROS-HIF-1 $\alpha$ -SERPINE1 axis aggravates hypoxia-induced GBM progression**