

***Cite this as:*** Lei FANG, Huan QI, Peng WANG, Shiqing WANG, Tianjiao LI, Tian XIA, Hailong PIAO, Chundong GU. UPF1 increases amino acid levels and promotes cell proliferation in lung adenocarcinoma via the eIF2 $\alpha$ -ATF4 axis[J]. Journal of Zhejiang University Science B, 2022, 23(10): 863-875.  
<https://doi.org/10.1631/jzus.B2200144>

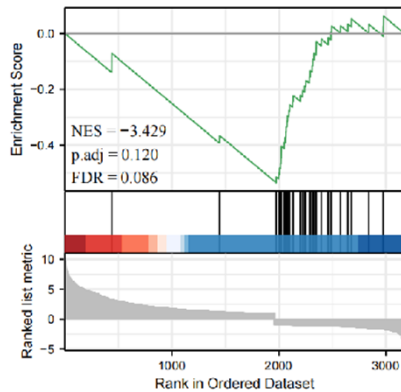
# **UPF1 increases amino acid levels and promotes cell proliferation in lung adenocarcinoma via the eIF2 $\alpha$ -ATF4 axis**

**Key words:** UPF1, ATF4, Amino acid, Lung adenocarcinoma

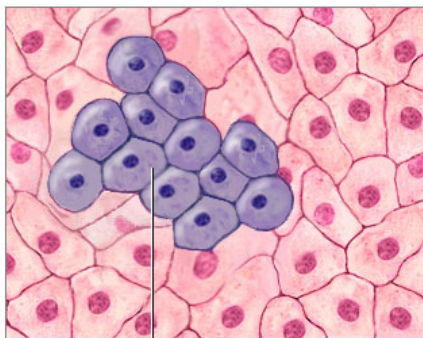
# Research Summary

This review mainly focused on the core components of nonsense-mediated mRNA decay(NMD), UPF1 proteins, and summarized the key roles it played in the following aspects:

eIF2AK4(GCN2) to Amino Acid Deficiency



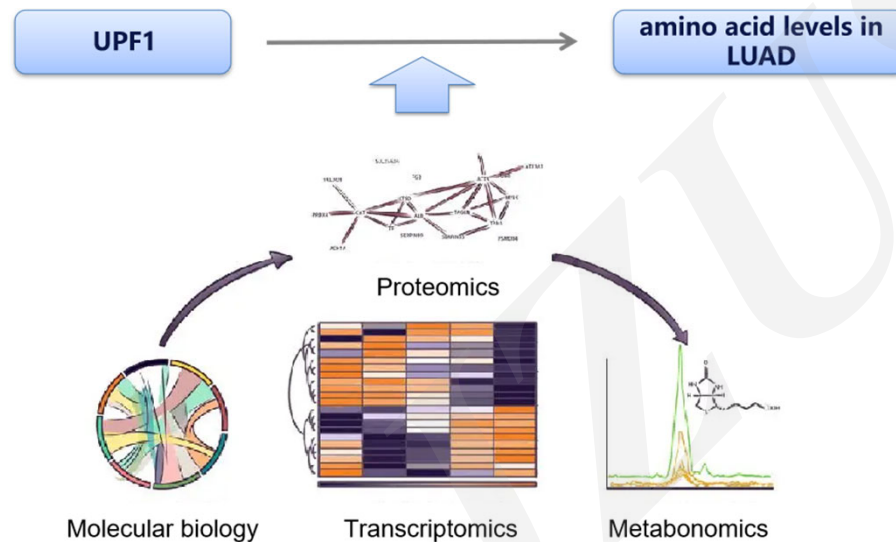
- Regulation of phosphorylation of eIF2A-Ser51 and ATF4
- Amino acid levels in LUAD cells
- LUAD cells proliferation in vitro and vivo
- UPF1 and ATF4 were significantly correlated with overall survival (OS) in LUAD patients



Proliferation of cancer cells

# Innovation points

- Introduction of UPF1 to increase amino acid levels depending on integrated analysis of multiple omics in LUAD for the first time.



- Introduction of UPF1 to regulate phosphorylation of eIF2A-Ser51 and ATF4 in LUAD.

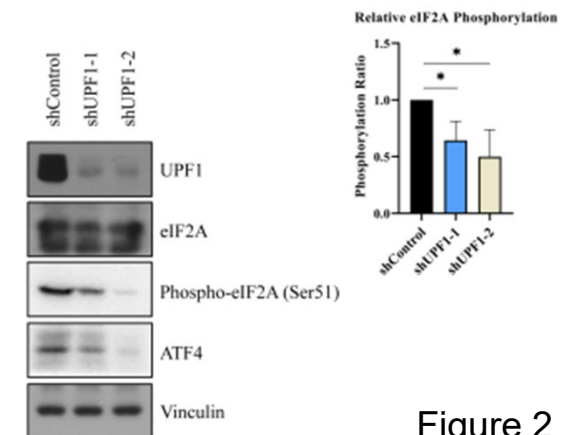
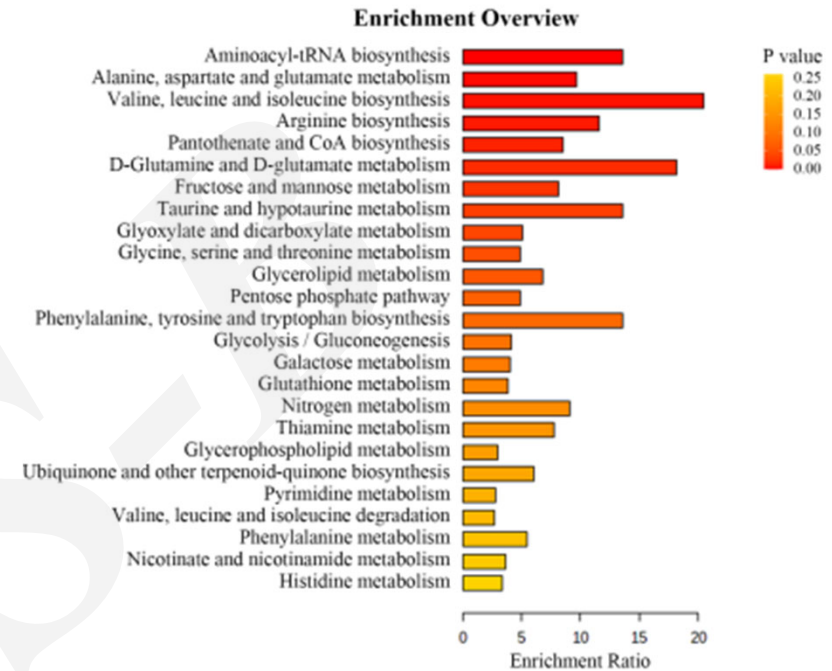


Figure 2

# ***Innovation points***

**A series of comprehensive figures were generated to introduce the function of UPF1 to increase amino acid levels in LUAD**

**Figure 1 | UPF1 knockdown in LUAD cells altered metabolomics profiling based on GC-MS.**

**Figure 2 | UPF1 knockdown inhibited Ser51 phosphorylation of eIF2A and ATF4 expression.**

**Figure 3 | UPF1 knockdown inhibited LUAD cell proliferation via ATF4 in vitro and in vivo.**

**Figure 4 | UPF1 enhanced amino acid levels depending upon ATF4 in LUAD cells.**

**Figure 5 | Expression of UPF1 in LUAD tissues and its relationship with patient prognosis.**