**Supplementary Figure Legends**

**Supplementary Figure S1.** The expression of SLC7A11-AS1 and KLF9. A) RT-qPCR detected the expression of SLC7A11-AS1 in MHCC97H cells transfected with sh-SLC7A11-AS1 or sh-NC. B) Western blot detected KLF9 level in MHCC97H cells transfected with sh-SLC7A11-AS1 or in combination with sh-KLF9.

**Supplementary Figure S2.** The binding sites among METTL3, SLC7A11-AS1, KLF9 and STUB1. A) SRAMP predicted the m6A site of SLC7A11-AS1. B) Ubibroswer predicted between various ubiquitination enzymes and KLF9. C, D) catRAPID predicted interactions of SLC7A11-AS1/STUB1 and SLC7A11-AS1/KLF9.

**Supplementary Figure S3.** The mRNA expression of KLF9. RT-qPCR examined the expression of KLF9 in MHCC97H cells transfected with sh-SLC7A11-AS1 or sh-NC.

**Supplementary Figure S4.** The effect of KLF9 ubiquitination in sh-SLC7A11-AS1-transfected Huh7 and MHCC97H cells. Western blot detected KLF9 ubiquitination in sh-SLC7A11-AS1-transfected Huh7 and MHCC97H cells.

**Supplementary Figure S5.** SLC7A11-AS1 silencing affected the decay of KLF9 protein. Western blot detected KLF9 protein in Huh7 and MHCC97H cells after CHX treatment for 0, 2, 4 and 8 h.

**Supplementary Figure S6.** The interactions of various ubiquitination enzymes and KLF9. Co-IP assay verified the interactions of various ubiquitination enzymes and KLF9.

**Supplementary Figure S7.** The binding relationship of SLC7A11-AS1, KLF9 and STUB1 in cytoplasm of Huh7 and MHCC97H cells. A, B) IF-FISH assay was used to detect co-location of SLC7A11-AS1 and KLF9/STUB1 in Huh7 and MHCC97H cells. Red indicated the location of SLC7A11-AS1 and green indicated the location of KLF9 or STUB1. C) IF assay was applied to examine co-location of KLF9 and STUB1 in Huh7 and MHCC97H cells. D) Co-IP was used to validate the interaction between KLF9 and STUB1. E) RIP was used to validate the interaction between SLC7A11-AS1 and KLF9/STUB1.