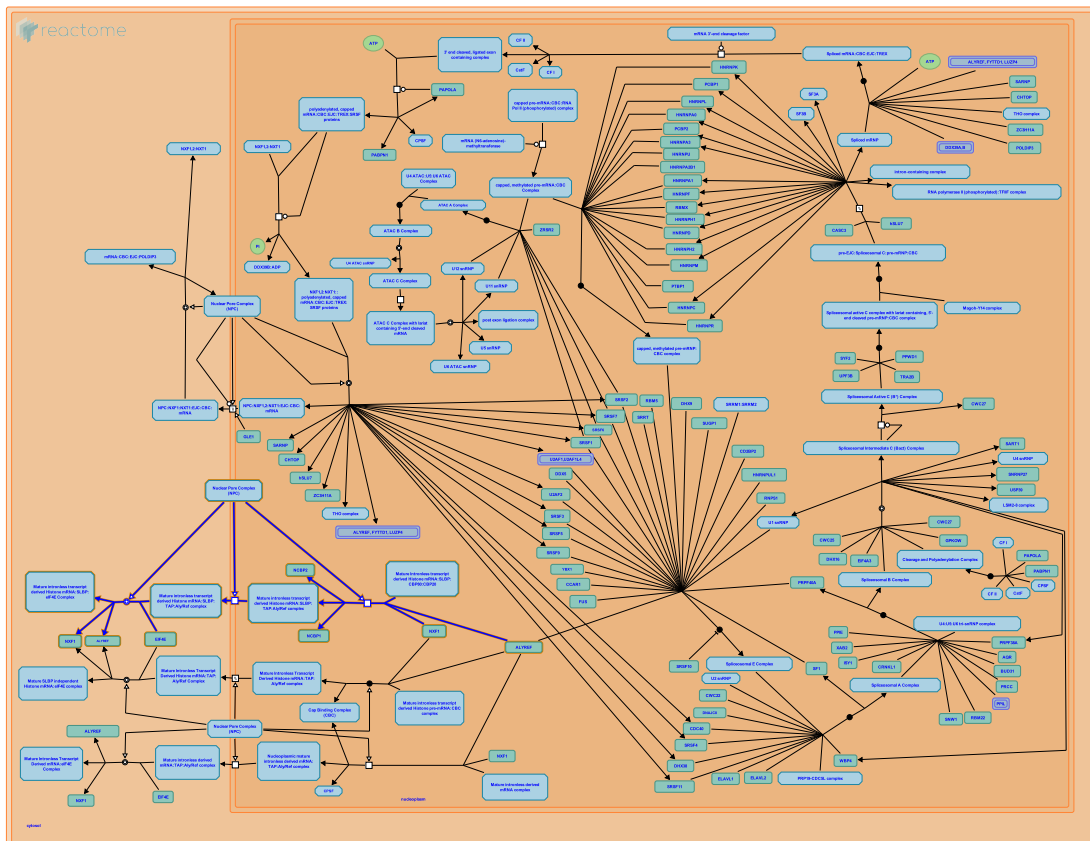


# Transport of the SLBP Dependant Mature mRNA



Gillespie, ME., Marzluff, WF.

European Bioinformatics Institute, New York University Langone Medical Center, Ontario Institute for Cancer Research, Oregon Health and Science University.

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## Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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## Literature references

- Fabregat, A., Sidiropoulos, K., Viteri, G., Forner, O., Marin-Garcia, P., Arnau, V. et al. (2017). Reactome pathway analysis: a high-performance in-memory approach. *BMC bioinformatics*, 18, 142. [↗](#)
- Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics*, 33, 3461-3467. [↗](#)
- Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res*, 46, D649-D655. [↗](#)
- Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology*, 14, e1005968. [↗](#)

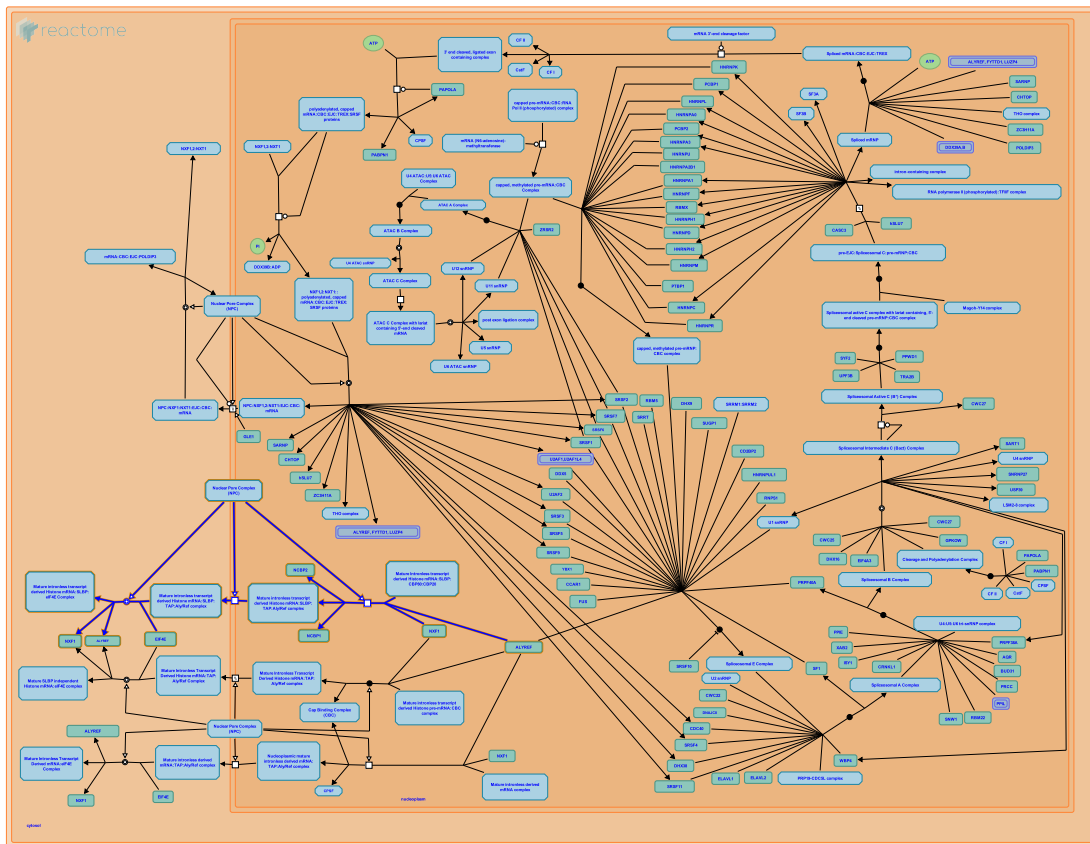
Reactome database release: 70

This document contains 1 pathway and 3 reactions ([see Table of Contents](#))

# Transport of the SLBP Dependant Mature mRNA ↗

Stable identifier: R-HSA-159230

Compartments: nucleoplasm, nuclear envelope, cytosol



Transport of U7 snRNP and stem-loop binding protein (SLBP) processed mRNA.

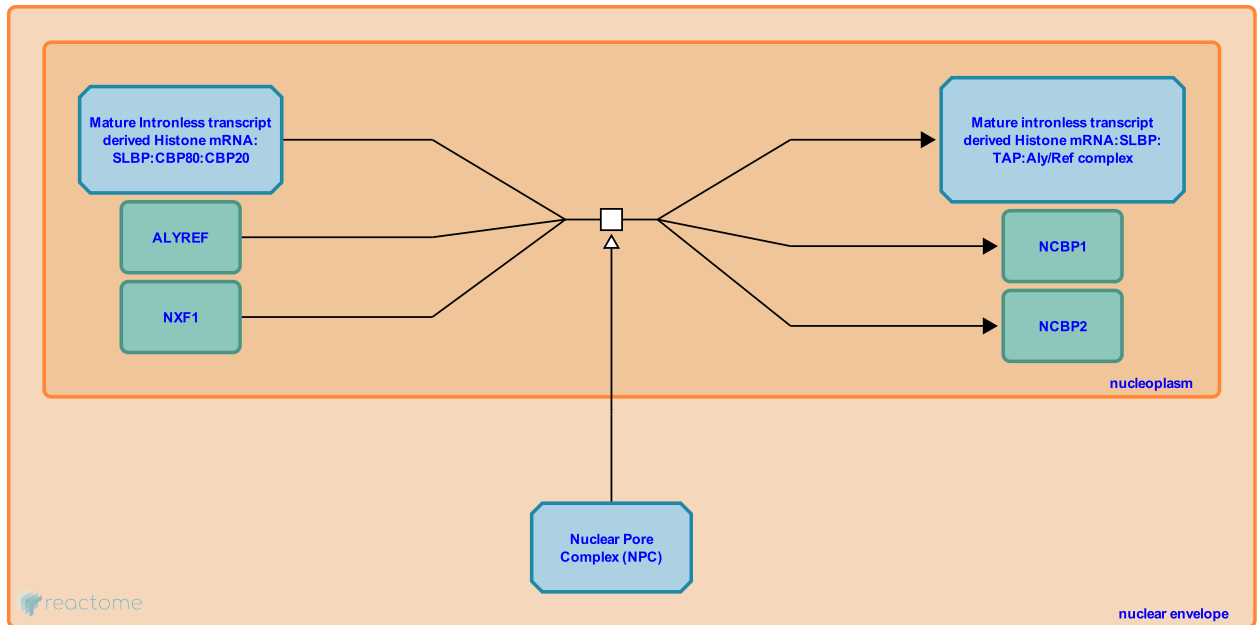
## Docking of Mature Replication Dependent Histone mRNA with the NPC ↗

**Location:** [Transport of the SLBP Dependant Mature mRNA](#)

**Stable identifier:** R-HSA-77587

**Type:** transition

**Compartments:** nucleoplasm, nuclear envelope



Histone mRNAs are exported by a mechanism that requires TAP, the key factor requires for transport of polyadenylated mRNAs. How TAP is recruited to the histone mRNAs is not known, but it is clear that transport can occur in the absence of either the stemloop or of SLBP. The stemloop and SLBP enhance the rate of transport of histone mRNAs in *Xenopus* oocytes, but are not essential for transport

**Followed by:** [Transport of the Mature Intronless Transcript Derived Histone mRNA:SLBP:TAP:Aly/Ref complex through the NPC](#)

### Editions

2003-08-22	Authored	Marzluff, WF.
2019-08-16	Edited	Gillespie, ME.

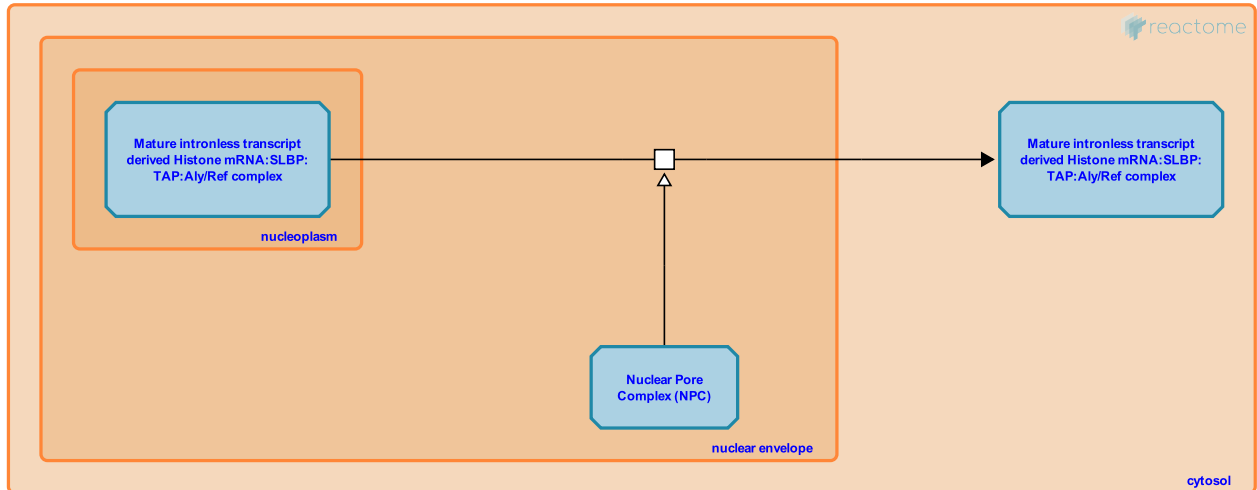
## Transport of the Mature Intronless Transcript Derived Histone mRNA:SLBP:TAP:Aly/Ref complex through the NPC ↗

**Location:** [Transport of the SLBP Dependant Mature mRNA](#)

**Stable identifier:** R-HSA-159046

**Type:** transition

**Compartments:** nuclear envelope, cytosol, nucleoplasm



Once the transport complex is fully assembled the mature mRNA can be translocated from the nucleoplasm to the cytoplasm. The assembled complex starts at the nucleoplasmic basket, travels through the pore, and ends its journey at the cytoplasmic face of the nuclear pore complex.

**Preceded by:** [Docking of Mature Replication Dependent Histone mRNA with the NPC](#)

**Followed by:** [Release of the Mature intronless transcript derived Histone mRNA:SLBP:eIF4E Complex](#)

### Literature references

von Moeller, H., Lerner, R., Ricciardi, A., Basquin, C., Marzluff, WF., Conti, E. (2013). Structural and biochemical studies of SLIP1-SLBP identify DBP5 and eIF3g as SLIP1-binding proteins. *Nucleic Acids Res.*, 41, 7960-71. ↗

Harris, ME., Bohni, R., Schneiderman, MH., Ramamurthy, L., Schumperli, D., Marzluff, WF. (1991). Regulation of histone mRNA in the unperturbed cell cycle: evidence suggesting control at two posttranscriptional steps. *Mol Cell Biol*, 11, 2416-24. ↗

### Editions

2005-03-13	Authored	Gillespie, ME.
2019-08-16	Edited	Gillespie, ME.

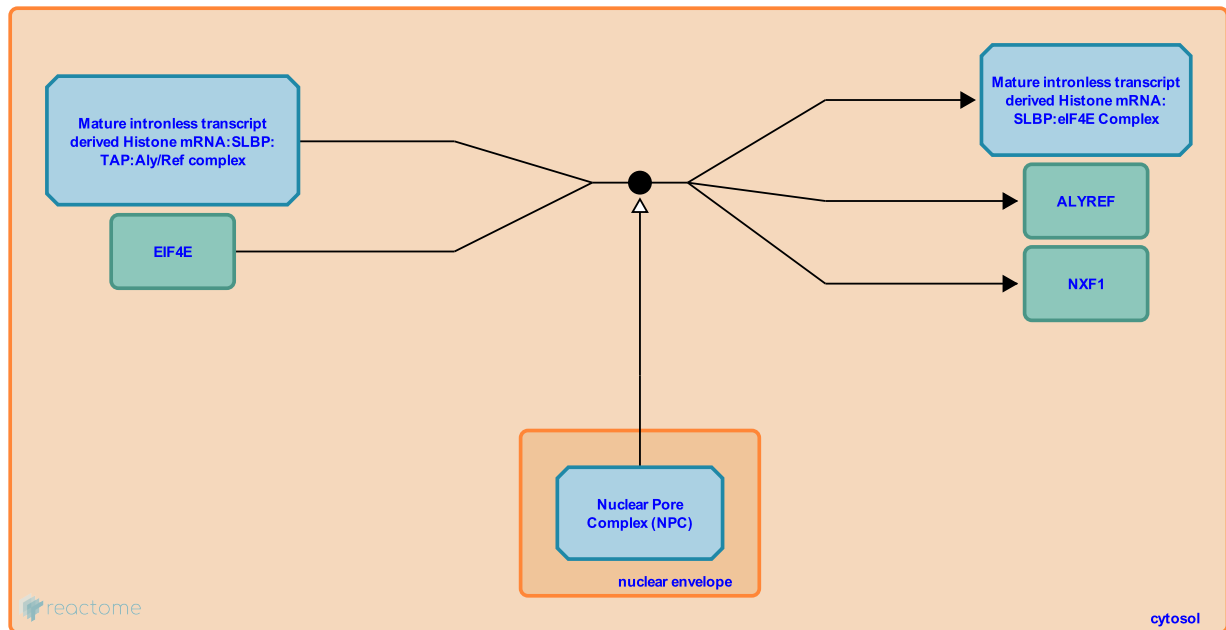
## Release of the Mature intronless transcript derived Histone mRNA:SLBP:eIF4E Complex ↗

**Location:** [Transport of the SLBP Dependant Mature mRNA](#)

**Stable identifier:** R-HSA-159050

**Type:** dissociation

**Compartments:** cytosol, nuclear envelope



At some point eIF4E binds the mature mRNA. While TAP and Aly/Ref are released and will be recycled back to the nucleoplasm (Hung et al.2010, Lindtner et al. 2002).

**Preceded by:** [Transport of the Mature Intronless Transcript Derived Histone mRNA:SLBP:TAP:Aly/Ref complex through the NPC](#)

### Literature references

Lindtner, S., Felber, BK., Kjems, J. (2002). An element in the 3' untranslated region of human LINE-1 retrotransposon mRNA binds NXF1(TAP) and can function as a nuclear export element. *RNA*, 8, 345-56. ↗

Hung, ML., Hautbergue, GM., Snijders, AP., Dickman, MJ., Wilson, SA. (2010). Arginine methylation of REF/ALY promotes efficient handover of mRNA to TAP/NXF1. *Nucleic Acids Res.*, 38, 3351-61. ↗

### Editions

2005-01-27

Authored

Gillespie, ME.

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