# hnRNPA2B1-related information

[Wikipedia link](https://en.wikipedia.org/wiki/HNRNPA2B1)

[UniprotKB](https://www.uniprot.org/uniprot/P22626)

## Symbols of hnRNPA2B1

[HNRNPA2B1](https://www.genenames.org/cgi-bin/gene_symbol_report?hgnc_id=5033), HNRNPA2, HNRNPB1, HNRPA2, HNRPA2B1, HNRPB1, IBMPFD2, RNPA2, SNRPB1, heterogeneous nuclear ribonucleoprotein A2/B1

## The discovery of hnRNPA2B1

HNRNPA2B1 gene contains 12 exons, including a B1 protein specific 36-nucleotide mini-exon.

ubiquitously expressed heterogeneous nuclear ribonucleoproteins (hnRNPs)

pre-mRNAs in the nucleus and appear to influence pre-mRNA processing and other aspects of mRNA metabolism and transport

While all of the hnRNPs are present in the nucleus, some seem to shuttle between the nucleus and the cytoplasm

The hnRNP proteins have distinct nucleic acid binding properties.

this gene has two repeats of quasi-RRM domains that bind to RNAs

HnRNPA2B1 is an autoantigen in autoimmune diseases such as [rheumatoid arthritis](https://en.wikipedia.org/wiki/Rheumatoid_arthritis), [systemic lupus erythematosus](https://en.wikipedia.org/wiki/Systemic_lupus_erythematosus) and [mixed connective tissue disease](https://en.wikipedia.org/wiki/Mixed_connective_tissue_disease). When referred to as an [autoantigen](https://en.wikipedia.org/wiki/Autoantigen), hnRNPA2B1 is also known as [RA33](https://en.wikipedia.org/wiki/RA33).

## The known functions of hnRNPA2B1

## m6A相关

writers, readers, and erasers of m6A;reader of the N(6)-methyladenosine (m6A) mark in primary-miRNAs (pri-miRNAs) ;HNRNPA2B1 downregulation of miR-29a-3p, miR-29b-3p, and miR-222 and upregulation of miR-1266-5p, miR-1268a, miR-671-3p ; (1–4)

## 其它

The HNRNPA2 and HNRNPB1 proteins are involved in packaging nascent mRNA, in alternative splicing, and in cytoplasmic RNA trafficking, translation, and stabilization. HNRNPA2 and HNRNPB1 also appear to function in telomere maintenance, cell proliferation and differentiation, and glucose transport.[[8]](https://en.wikipedia.org/wiki/HNRNPA2B1#cite_note-8)[[9]](https://en.wikipedia.org/wiki/HNRNPA2B1#cite_note-9)

Function of HNRNPA2B1 gene can be effectively examined by siRNA knockdown based on an independent validation.[[10]](https://en.wikipedia.org/wiki/HNRNPA2B1#cite_note-10)

HNRPA2B1 has been shown to [interact](https://en.wikipedia.org/wiki/Protein-protein_interaction) with [casein kinase 2, alpha 1](https://en.wikipedia.org/wiki/Casein_kinase_2,_alpha_1)

associates with nascent pre-mRNAs, packaging them into hnRNP particles.

processes such as transcription, pre-mRNA processing, RNA nuclear export, subcellular location, mRNA translation and stability of mature mRNAs (PubMed:[19099192](https://www.uniprot.org/citations/19099192)).

acts by specifically recognizing and binding the A2RE (21 nucleotide hnRNP A2 response element) or the A2RE11 (derivative 11 nucleotide oligonucleotide) sequence motifs present on some mRNAs, and promotes their transport to the cytoplasm (PubMed:[10567417](https://www.uniprot.org/citations/10567417)).

Specifically binds single-stranded telomeric DNA sequences, protecting telomeric DNA repeat against endonuclease digestion (By similarity).

Also binds other RNA molecules, such as primary miRNA (pri-miRNAs): acts as a nuclear ‘reader’ of the N6-methyladenosine (m6A) mark by specifically recognizing and binding a subset of nuclear m6A-containing pri-miRNAs.

Binding to m6A-containing pri-miRNAs promotes pri-miRNA processing by enhancing binding of DGCR8 to pri-miRNA transcripts (PubMed:[26321680](https://www.uniprot.org/citations/26321680)).

Involved in miRNA sorting into exosomes following sumoylation(PubMed:[24356509](https://www.uniprot.org/citations/24356509)).

Acts as a regulator of efficiency of mRNA splicing, possibly by binding to m6A-containing pre-mRNAs (PubMed:[26321680](https://www.uniprot.org/citations/26321680)).

## hnRNPA2B1的功能学注释

#### GO - Molecular functioni

* [G-rich strand telomeric DNA binding](https://www.ebi.ac.uk/QuickGO/term/GO:0098505) Source: BHF-UCL
* [N6-methyladenosine-containing RNA binding](https://www.ebi.ac.uk/QuickGO/term/GO:1990247) Source: UniProtKB
* [RNA binding](https://www.ebi.ac.uk/QuickGO/term/GO:0003723) Source: HGNC
* [identical protein binding](https://www.ebi.ac.uk/QuickGO/term/GO:0042802) Source: IntAct
* [mRNA 3’-UTR binding](https://www.ebi.ac.uk/QuickGO/term/GO:0003730) Source: UniProtKB
* [mRNA binding](https://www.ebi.ac.uk/QuickGO/term/GO:0003729) Source: GO\_Central
* [miRNA binding](https://www.ebi.ac.uk/QuickGO/term/GO:0035198) Source: UniProtKB
* [pre-mRNA intronic binding](https://www.ebi.ac.uk/QuickGO/term/GO:0097157) Source: Ensembl
* [single-stranded telomeric DNA binding](https://www.ebi.ac.uk/QuickGO/term/GO:0043047) Source: HGNC

#### GO - Biological processi

* [G-quadruplex DNA unwinding](https://www.ebi.ac.uk/QuickGO/term/GO:0044806) Source: BHF-UCL
* [RNA metabolic process](https://www.ebi.ac.uk/QuickGO/term/GO:0016070) Source: Reactome
* [RNA transport](https://www.ebi.ac.uk/QuickGO/term/GO:0050658) Source: HGNC
* [interleukin-12-mediated signaling pathway](https://www.ebi.ac.uk/QuickGO/term/GO:0035722) Source: Reactome
* [mRNA export from nucleus](https://www.ebi.ac.uk/QuickGO/term/GO:0006406) Source: UniProtKB
* [mRNA processing](https://www.ebi.ac.uk/QuickGO/term/GO:0006397) Source: HGNC
* [mRNA splicing, via spliceosome](https://www.ebi.ac.uk/QuickGO/term/GO:0000398) Source: UniProtKB[]
* [miRNA transport](https://www.ebi.ac.uk/QuickGO/term/GO:1990428) Source: UniProtKB
* [negative regulation of mRNA splicing, via spliceosome](https://www.ebi.ac.uk/QuickGO/term/GO:0048025) Source: Ensembl
* [negative regulation of transcription by RNA polymerase II](https://www.ebi.ac.uk/QuickGO/term/GO:0000122) Source: Ensembl
* [positive regulation of telomerase RNA reverse transcriptase activity](https://www.ebi.ac.uk/QuickGO/term/GO:1905663) Source: BHF-UCL
* [positive regulation of telomere maintenance via telomere lengthening](https://www.ebi.ac.uk/QuickGO/term/GO:1904358) Source: BHF-UCL
* [primary miRNA processing](https://www.ebi.ac.uk/QuickGO/term/GO:0031053) Source: UniProtKB

# 练习

(2)

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2. Carabet LA, Leblanc E, Lallous N, Morin H, Ghaidi F, Lee J, et al. Computer-aided discovery of small molecules targeting the rna splicing activity of hnRNP a1 in castration-resistant prostate cancer. Molecules [Internet]. 2019;24. Available from: [https://www.ncbi.nlm.nih.gov/pubmed/30791548
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3. Hung CY, Wang YC, Chuang JY, Young MJ, Liaw H, Chang WC, et al. Nm23-h1-stabilized hnRNPA2/b1 promotes internal ribosomal entry site (ires)-mediated translation of sp1 in the lung cancer progression. Sci Rep [Internet]. 2017;7:9166. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28831131>

4. Xuan Y, Wang J, Ban L, Lu JJ, Yi C, Li Z, et al. HnRNPA2/b1 activates cyclooxygenase-2 and promotes tumor growth in human lung cancers. Mol Oncol [Internet]. 2016;10:610–24. Available from: [https://www.ncbi.nlm.nih.gov/pubmed/26774881
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