**Experiment No. 1**

**Aim:** To retrieve the nucleotide sequence of MDM2 proto-oncogene (Mdm2) gene in *Homo sapiens* (humans) - in Fasta & Genbank format using NCBI

**Material Required:** NCBI, Fasta & Genbank format

**Procedure:**

1. Go to the [**NCBI homepage**](https://www.ncbi.nlm.nih.gov/)

2. Select “**Nucleotide**"

3. Enter “**Accession No**" (NM\_002392.6) in the search field and click

the "Search" button.

4. Select specific format

5. Interpret the results

**Observations:**

**1. Given gene sequence in Fasta format:**

**>NM\_002392.6 Homo sapiens MDM2 proto-oncogene (MDM2), transcript variant 1, mRNA**

GGGCGCGCACCGAGGCACCGCGGCGAGCTTGGCTGCTTCTGGGGCCTGTGTGGCCCTGTGTGTCGGAAAG

ATGGAGCAAGAAGCCGAGCCCGAGGGGCGGCCGCGACCCCTCTGACCGAGATCCTGCTGCTTTCGCAGCC

AGGAGCACCGTCCCTCCCCGGATTAGTGCGTACGAGCGCCCAGTGCCCTGGCCCGGAGAGTGGAATGATC

CCCGAGGCCCAGGGCGTCGTGCTTCCGCGCGCCCCGTGAAGGAAACTGGGGAGTCTTGAGGGACCCCCGA

CTCCAAGCGCGAAAACCCCGGATGGTGAGGAGCAGGCAAATGTGCAATACCAACATGTCTGTACCTACTG

ATGGTGCTGTAACCACCTCACAGATTCCAGCTTCGGAACAAGAGACCCTGGTTAGACCAAAGCCATTGCT

TTTGAAGTTATTAAAGTCTGTTGGTGCACAAAAAGACACTTATACTATGAAAGAGGTTCTTTTTTATCTT

GGCCAGTATATTATGACTAAACGATTATATGATGAGAAGCAACAACATATTGTATATTGTTCAAATGATC

TTCTAGGAGATTTGTTTGGCGTGCCAAGCTTCTCTGTGAAAGAGCACAGGAAAATATATACCATGATCTA

CAGGAACTTGGTAGTAGTCAATCAGCAGGAATCATCGGACTCAGGTACATCTGTGAGTGAGAACAGGTGT

CACCTTGAAGGTGGGAGTGATCAAAAGGACCTTGTACAAGAGCTTCAGGAAGAGAAACCTTCATCTTCAC

ATTTGGTTTCTAGACCATCTACCTCATCTAGAAGGAGAGCAATTAGTGAGACAGAAGAAAATTCAGATGA

ATTATCTGGTGAACGACAAAGAAAACGCCACAAATCTGATAGTATTTCCCTTTCCTTTGATGAAAGCCTG

GCTCTGTGTGTAATAAGGGAGATATGTTGTGAAAGAAGCAGTAGCAGTGAATCTACAGGGACGCCATCGA

ATCCGGATCTTGATGCTGGTGTAAGTGAACATTCAGGTGATTGGTTGGATCAGGATTCAGTTTCAGATCA

GTTTAGTGTAGAATTTGAAGTTGAATCTCTCGACTCAGAAGATTATAGCCTTAGTGAAGAAGGACAAGAA

CTCTCAGATGAAGATGATGAGGTATATCAAGTTACTGTGTATCAGGCAGGGGAGAGTGATACAGATTCAT

TTGAAGAAGATCCTGAAATTTCCTTAGCTGACTATTGGAAATGCACTTCATGCAATGAAATGAATCCCCC

CCTTCCATCACATTGCAACAGATGTTGGGCCCTTCGTGAGAATTGGCTTCCTGAAGATAAAGGGAAAGAT

AAAGGGGAAATCTCTGAGAAAGCCAAACTGGAAAACTCAACACAAGCTGAAGAGGGCTTTGATGTTCCTG

ATTGTAAAAAAACTATAGTGAATGATTCCAGAGAGTCATGTGTTGAGGAAAATGATGATAAAATTACACA

AGCTTCACAATCACAAGAAAGTGAAGACTATTCTCAGCCATCAACTTCTAGTAGCATTATTTATAGCAGC

CAAGAAGATGTGAAAGAGTTTGAAAGGGAAGAAACCCAAGACAAAGAAGAGAGTGTGGAATCTAGTTTGC

CCCTTAATGCCATTGAACCTTGTGTGATTTGTCAAGGTCGACCTAAAAATGGTTGCATTGTCCATGGCAA

AACAGGACATCTTATGGCCTGCTTTACATGTGCAAAGAAGCTAAAGAAAAGGAATAAGCCCTGCCCAGTA

TGTAGACAACCAATTCAAATGATTGTGCTAACTTATTTCCCCTAGTTGACCTGTCTATAAGAGAATTATA

TATTTCTAACTATATAACCCTAGGAATTTAGACAACCTGAAATTTATTCACATATATCAAAGTGAGAAAA

TGCCTCAATTCACATAGATTTCTTCTCTTTAGTATAATTGACCTACTTTGGTAGTGGAATAGTGAATACT

TACTATAATTTGACTTGAATATGTAGCTCATCCTTTACACCAACTCCTAATTTTAAATAATTTCTACTCT

GTCTTAAATGAGAAGTACTTGGTTTTTTTTTTTCTTAAATATGTATATGACATTTAAATGTAACTTATTA

TTTTTTTTGAGACCGAGTCTTGCTCTGTTACCCAGGCTGGAGTGCAGTGGCGTGATCTTGGCTCACTGCA

AGCTCTGCCTCCCGGGTTCGCACCATTCTCCTGCCTCAGCCTCCCAATTAGCTTGGCCTACAGTCATCTG

CCACCACACCTGGCTAATTTTTTGTACTTTTAGTAGAGACAGGGTTTCACCGTGTTAGCCAGGATGGTCT

CGATCTCCTGACCTCGTGATCCGCCCACCTCGGCCTCCCAAAGTGCTGGGATTACAGGCATGAGCCACCG

CGTCCGGCCTAAATGTCACTTAGTACCTTTGATATAAAGAGAAAATGTGTGAAAGATTTAGTTTTTTGTT

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ACAGGCATGCACCACCATGCCCAGCTAATTTTTGTATTTTTAGTAGAGATAGGGTTTCACCATGTTGGCC

AGGCTGGTCACGAACTCCTGACCTCAAGTGAGGTCACCCGCCTCGGCCTCCCGAAGTGCTGGGATTGCAG

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CCACCATACCAGCTGATTTTTTTGTATTTTTAGTAAAGACAGGGTTTCACCATGTTAGCCAGGCTGATCT

TGAACTCCTAAACTCAAGTGATCTACTCACCTCAGCCTCCCAAAATGCTGGGATTACAGATGTGAGGCAC

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TCTTGGCCTCGCAAAGTGCTAAGTAGGATTACAGGCGTTAGCCACCACACCCGGCTGTAAAAATGTACTT

ATTCTCCAGCCTCTTTTGTATAAACCATAGTAAGGGATGGGAGTAATGATGTTATCTGTGAAAATAGCCA

CCATTTACCCGTAAGACAAAACTTGTTAAAGCCTCCTGAGTCTAACCTAGATTACATCAGGCCCTTTTTC

ACACACAAAAAAATCCTTTATGGGATTTAATGGAATCTGTTGTTTCCCCCTAAGTTGAAAAACAACTCTA

AGACACTTTAAAGTACCTTCTTGGCCTGGGTTACATGGTTCCCAGCCTAGGTTTCAGACTTTTGCTTAAG

GCCAGTTTTAGAAACCCGTGAATTCAGAAAAGTTAATTCAGAAATTTGATAAACAGAATTGTTATTTAAA

AACTAACTGGAAAGATTGTTAAGTTCTTTCTGAATTATTCAGAAATTATGCATCATTTTCCTTCAAGAAT

GACAGGGTCAGCATGTGGAATTCCAAGATACCTCTTGACTTCCTCTCAAGCTCCGTGTTTGGTCAGTGGA

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TTTGAATTTGAAAAATATAGTAACAAGCCTGTCAAATATCTGCAAGAACTATGGAATAAAACTACTGATG

CAGTGAAGACAGTTGAAAAGATCAAACAAATGCCAAGCTATATTTATAATGAACAAATTCAAGAAAAAGG

ACTACGGAAAGTTCAGGACATCAAAGAAGTCAGGCAAAACTCATCTTGACCCCTGTTGCAGGCAAAGGAA

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AAATTTATGGCTAGTGATATATATAAAGTAAAATTTTCTTTGCAGTAAAATATGCCCTTTATTATAGAAG

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ACAATTATGTATTTAACATTTAAAATTTCTAATATAAGTATCTCTCAAACTGTGGATTAACTTCTTGATT

TATATTTAAATATGAATCTTAAGCAAAACAGTGAAAATAACCATCTTGATTTAGTGTTTTTCTCCCATAT

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CTTCAGCTACAACCAAGCAGAATCTCTTTTTTTTGGAGGTCCTCGAAGCATTATTTGGAGTTGATAATAC

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TCCTCAAAGCATTATTGGAGTTCATAATACTGAAGCTAGAACCAAGCAGAATCTGTTTTTTTCTGAGGAG

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TATAGTACACGTGTTGAAAATAAATGATTAAGAATTGTTTCAAGAATGCAATTATTTGATCTTAAATTTT

TATGAGTTGTTAAAATAGAAATTATTTGAATATCATATATTTGGGTAACAAAAGGCACAAGTCTGAATGT

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TTGGGAGCCTCCAATGAGAGCAACTTGAGAGAATGATGTTGCAAGTTAGTAGGAGTAAGAAATGCTGTGT

TCTCCCTGTCTTCTCTTAGGTCACATGGCAGCCTGGCCTAAGTGATCGTGAATGGTCTATAAGGGAGGTA

GCTGGGACAGGGAGGGGAGTTTGGGCTAGCCACCGTACCACTTGTCAGCGTGAAAAGTAAGATTGTAATT

GCCTGTTTAGTTTTCTGCCTCATCTTTGAAAGTTCCACCAAGCTGGGAACCTCTTGATTGTGAGGCACAA

ATGTAAGTACATCAGAAAAAAACAAAAAAACTGGCTTTAAAGCAGGAGCTTGTGGGCCCCTAAGCCAGAC

GGGGACTAGCTTTTGGCATTATATAATTAAGATTTTTTAAATCCTTAATAAGGGTTTTATTTTATTTTTA

TTTATTTTTTGAGACGGAGTCTTGCTCTGTGGCTCAGGCTGGAGTACAGTGGTGCAATCTTGGCTCACTG

CAACCTCTGCCTCCTGGCTGTGTTCAAGTGGTTCTGCTTCAGCCTCCCAAGTAGCTGGGGTTAGAGCACC

CTGTCACCACGCCCCGCTAATTTTTGTATTTCTAGCAGAGATGAAGTTTCACTATGTTGGCCAGGCTGGG

CTCAAACTCCTGACCTCAAGTGATCTGCCCGCCTTGGCCCCCCAAAGTGCTGTGATTACAGGCGTGAGCC

GCCACGCCCAGCCTAATAAGGGTTTTAAAGATAATTAGTGTGTAGGTCTGTAGGCTTATGATGGTAACCA

CAAGTTGTTAATGGCATTGTGAAAAGTTTTTAGTTGCGCTTTATGGGTGGATGCTGAATTACATTTTGAT

TTGATACTTATAAAAAGAAAAAGTATTTCTTCAGCTTAAAAAATTGTTTAAAAGTTTGTGATCATATTGT

CTACCATGTAGCCAGCTTTCAATTATATGTAAGAGGGACTTTTTGACATTTACAAATAATACTTTGAGGT

AGATATCTGAAAGCACCAGCACTTGGAAGGTGTTCAGAAGTAACAAATTATAAAATGAGCTAACAAACGA

AAGGCAAAATAAAACCGTAAAGCAAGCAGATGGGAGGCGTGTTCAGTAACTTATTCATAATGCATCTGAA

ATGATTGCTGTACTCAAATATTTAACGTTAGAGTAATAGTATTTTGAATGAAAACCATAGTTGATTGTCT

**2. The given gene sequence in Genbank format:**

LOCUS NM\_002392 7490 bp mRNA linear PRI 10-JAN-2021

DEFINITION Homo sapiens MDM2 proto-oncogene (MDM2), transcript variant 1,

mRNA.

ACCESSION NM\_002392

VERSION NM\_002392.6

KEYWORDS RefSeq; RefSeq Select.

SOURCE Homo sapiens (human)

ORGANISM [Homo sapiens](https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9606)

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;

Mammalia; Eutheria; Euarchontoglires; Primates; Haplorrhini;

Catarrhini; Hominidae; Homo.

REFERENCE 1 (bases 1 to 7490)

AUTHORS Sam KK, Gan CP, Yee PS, Chong CE, Lim KP, Karen-Ng LP, Chang WS,

Nathan S, Rahman ZA, Ismail SM and Cheong SC.

TITLE Novel MDM2 splice variants identified from oral squamous cell

carcinoma

JOURNAL Oral Oncol 48 (11), 1128-1135 (2012)

PUBMED [22705356](https://www.ncbi.nlm.nih.gov/pubmed/22705356)

REMARK GeneRIF: MDM2 splice variants is significantly assiciated with oral

squamous cell carcinoma and increased the risk of oral squamous

cell carcinoma development

REFERENCE 2 (bases 1 to 7490)

AUTHORS Dutertre M, Sanchez G, De Cian MC, Barbier J, Dardenne E, Gratadou

L, Dujardin G, Le Jossic-Corcos C, Corcos L and Auboeuf D.

TITLE Cotranscriptional exon skipping in the genotoxic stress response

JOURNAL Nat Struct Mol Biol 17 (11), 1358-1366 (2010)

PUBMED [20972445](https://www.ncbi.nlm.nih.gov/pubmed/20972445)

REFERENCE 3 (bases 1 to 7490)

AUTHORS Jeyaraj S, O'Brien DM and Chandler DS.

TITLE MDM2 and MDM4 splicing: an integral part of the cancer spliceome

JOURNAL Front Biosci (Landmark Ed) 14, 2647-2656 (2009)

PUBMED [19273224](https://www.ncbi.nlm.nih.gov/pubmed/19273224)

REMARK Review article

Publication Status: Online-Only

REFERENCE 4 (bases 1 to 7490)

AUTHORS Cheng TH and Cohen SN.

TITLE Human MDM2 isoforms translated differentially on constitutive

versus p53-regulated transcripts have distinct functions in the

p53/MDM2 and TSG101/MDM2 feedback control loops

JOURNAL Mol Cell Biol 27 (1), 111-119 (2007)

PUBMED [17060450](https://www.ncbi.nlm.nih.gov/pubmed/17060450)

REMARK GeneRIF: analysis of mechanism of formation of the principal MDM2

isoforms, differential effects of p53 on the production of these

isoforms, and differential abilities of human MDM2 isoforms as

regulators of the MDM2/TSG101 and p53/MDM2 feedback control loops

REFERENCE 5 (bases 1 to 7490)

AUTHORS Liang H, Atkins H, Abdel-Fattah R, Jones SN and Lunec J.

TITLE Genomic organisation of the human MDM2 oncogene and relationship to

its alternatively spliced mRNAs

JOURNAL Gene 338 (2), 217-223 (2004)

PUBMED [15315825](https://www.ncbi.nlm.nih.gov/pubmed/15315825)

REMARK GeneRIF: MDM2 gene spans approximately 33 kb and is divided into 12

exons.

REFERENCE 6 (bases 1 to 7490)

AUTHORS Bartel F, Pinkert D, Fiedler W, Kappler M, Wurl P, Schmidt H and

Taubert H.

TITLE Expression of alternatively and aberrantly spliced transcripts of

the MDM2 mRNA is not tumor-specific

JOURNAL Int J Oncol 24 (1), 143-151 (2004)

PUBMED [14654951](https://www.ncbi.nlm.nih.gov/pubmed/14654951)

REFERENCE 7 (bases 1 to 7490)

AUTHORS Jin X, Turcott E, Englehardt S, Mize GJ and Morris DR.

TITLE The two upstream open reading frames of oncogene mdm2 have

different translational regulatory properties

JOURNAL J Biol Chem 278 (28), 25716-25721 (2003)

PUBMED [12730202](https://www.ncbi.nlm.nih.gov/pubmed/12730202)

REMARK GeneRIF: two upstream open reading frames of oncogene mdm2 may play

a fundamental role in regulating expression of the mdm2 gene

REFERENCE 8 (bases 1 to 7490)

AUTHORS Bartel F, Taubert H and Harris LC.

TITLE Alternative and aberrant splicing of MDM2 mRNA in human cancer

JOURNAL Cancer Cell 2 (1), 9-15 (2002)

PUBMED [12150820](https://www.ncbi.nlm.nih.gov/pubmed/12150820)

REMARK GeneRIF: MDM2 has been characterized as a protein that binds to and

facilitates degradation of the tumor suppressor p53. Splice

variants of MDM2 transcripts have been identified in both tumors

and normal tissues.

Review article

REFERENCE 9 (bases 1 to 7490)

AUTHORS Brown CY, Mize GJ, Pineda M, George DL and Morris DR.

TITLE Role of two upstream open reading frames in the translational

control of oncogene mdm2

JOURNAL Oncogene 18 (41), 5631-5637 (1999)

PUBMED [10523842](https://www.ncbi.nlm.nih.gov/pubmed/10523842)

REFERENCE 10 (bases 1 to 7490)

AUTHORS Landers JE, Cassel SL and George DL.

TITLE Translational enhancement of mdm2 oncogene expression in human

tumor cells containing a stabilized wild-type p53 protein

JOURNAL Cancer Res 57 (16), 3562-3568 (1997)

PUBMED [9270029](https://www.ncbi.nlm.nih.gov/pubmed/9270029)

REFERENCE 11 (bases 1 to 7490)

AUTHORS Sigalas I, Calvert AH, Anderson JJ, Neal DE and Lunec J.

TITLE Alternatively spliced mdm2 transcripts with loss of p53 binding

domain sequences: transforming ability and frequent detection in

human cancer

JOURNAL Nat Med 2 (8), 912-917 (1996)

PUBMED [8705862](https://www.ncbi.nlm.nih.gov/pubmed/8705862)

REFERENCE 12 (bases 1 to 7490)

AUTHORS Zauberman A, Flusberg D, Haupt Y, Barak Y and Oren M.

TITLE A functional p53-responsive intronic promoter is contained within

the human mdm2 gene

JOURNAL Nucleic Acids Res 23 (14), 2584-2592 (1995)

PUBMED [7651818](https://www.ncbi.nlm.nih.gov/pubmed/7651818)

REFERENCE 13 (bases 1 to 7490)

AUTHORS Olson DC, Marechal V, Momand J, Chen J, Romocki C and Levine AJ.

TITLE Identification and characterization of multiple mdm-2 proteins and

mdm-2-p53 protein complexes

JOURNAL Oncogene 8 (9), 2353-2360 (1993)

PUBMED [7689721](https://www.ncbi.nlm.nih.gov/pubmed/7689721)

REFERENCE 14 (bases 1 to 7490)

AUTHORS Oliner JD, Kinzler KW, Meltzer PS, George DL and Vogelstein B.

TITLE Amplification of a gene encoding a p53-associated protein in human

sarcomas

JOURNAL Nature 358 (6381), 80-83 (1992)

PUBMED [1614537](https://www.ncbi.nlm.nih.gov/pubmed/1614537)

COMMENT REVIEWED [REFSEQ](https://www.ncbi.nlm.nih.gov/RefSeq/): This record has been curated by NCBI staff. The

reference sequence was derived from [AC025423.32](https://www.ncbi.nlm.nih.gov/nuccore/AC025423.32).

On Oct 27, 2020 this sequence version replaced [NM\_002392.5](https://www.ncbi.nlm.nih.gov/nuccore/NM_002392.5).

ORIGIN

1 gggcgcgcac cgaggcaccg cggcgagctt ggctgcttct ggggcctgtg tggccctgtg

61 tgtcggaaag atggagcaag aagccgagcc cgaggggcgg ccgcgacccc tctgaccgag

121 atcctgctgc tttcgcagcc aggagcaccg tccctccccg gattagtgcg tacgagcgcc

181 cagtgccctg gcccggagag tggaatgatc cccgaggccc agggcgtcgt gcttccgcgc

241 gccccgtgaa ggaaactggg gagtcttgag ggacccccga ctccaagcgc gaaaaccccg

301 gatggtgagg agcaggcaaa tgtgcaatac caacatgtct gtacctactg atggtgctgt

361 aaccacctca cagattccag cttcggaaca agagaccctg gttagaccaa agccattgct

421 tttgaagtta ttaaagtctg ttggtgcaca aaaagacact tatactatga aagaggttct

481 tttttatctt ggccagtata ttatgactaa acgattatat gatgagaagc aacaacatat

541 tgtatattgt tcaaatgatc ttctaggaga tttgtttggc gtgccaagct tctctgtgaa

601 agagcacagg aaaatatata ccatgatcta caggaacttg gtagtagtca atcagcagga

661 atcatcggac tcaggtacat ctgtgagtga gaacaggtgt caccttgaag gtgggagtga

721 tcaaaaggac cttgtacaag agcttcagga agagaaacct tcatcttcac atttggtttc

781 tagaccatct acctcatcta gaaggagagc aattagtgag acagaagaaa attcagatga

841 attatctggt gaacgacaaa gaaaacgcca caaatctgat agtatttccc tttcctttga

901 tgaaagcctg gctctgtgtg taataaggga gatatgttgt gaaagaagca gtagcagtga

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1021 ttggttggat caggattcag tttcagatca gtttagtgta gaatttgaag ttgaatctct

1081 cgactcagaa gattatagcc ttagtgaaga aggacaagaa ctctcagatg aagatgatga

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1201 tcctgaaatt tccttagctg actattggaa atgcacttca tgcaatgaaa tgaatccccc

1261 ccttccatca cattgcaaca gatgttgggc ccttcgtgag aattggcttc ctgaagataa

1321 agggaaagat aaaggggaaa tctctgagaa agccaaactg gaaaactcaa cacaagctga

1381 agagggcttt gatgttcctg attgtaaaaa aactatagtg aatgattcca gagagtcatg

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1561 tgaaagggaa gaaacccaag acaaagaaga gagtgtggaa tctagtttgc cccttaatgc

1621 cattgaacct tgtgtgattt gtcaaggtcg acctaaaaat ggttgcattg tccatggcaa

1681 aacaggacat cttatggcct gctttacatg tgcaaagaag ctaaagaaaa ggaataagcc

1741 ctgcccagta tgtagacaac caattcaaat gattgtgcta acttatttcc cctagttgac

1801 ctgtctataa gagaattata tatttctaac tatataaccc taggaattta gacaacctga

1861 aatttattca catatatcaa agtgagaaaa tgcctcaatt cacatagatt tcttctcttt

1921 agtataattg acctactttg gtagtggaat agtgaatact tactataatt tgacttgaat

1981 atgtagctca tcctttacac caactcctaa ttttaaataa tttctactct gtcttaaatg

2041 agaagtactt ggtttttttt tttcttaaat atgtatatga catttaaatg taacttatta

2101 ttttttttga gaccgagtct tgctctgtta cccaggctgg agtgcagtgg cgtgatcttg

2161 gctcactgca agctctgcct cccgggttcg caccattctc ctgcctcagc ctcccaatta

2221 gcttggccta cagtcatctg ccaccacacc tggctaattt tttgtacttt tagtagagac

2281 agggtttcac cgtgttagcc aggatggtct cgatctcctg acctcgtgat ccgcccacct

2341 cggcctccca aagtgctggg attacaggca tgagccaccg cgtccggcct aaatgtcact

2401 tagtaccttt gatataaaga gaaaatgtgt gaaagattta gttttttgtt tttttgtttg

2461 tttgtttgtt tgtttgtttt gagatgagtc tctctgtcgc ccaggctgga gtgcagtgtc

2521 atgatctagc agtctccgct tcccgggttc aagccattct cctggctcag cctctggagc

2581 agctgggatt acaggcatgc accaccatgc ccagctaatt tttgtatttt tagtagagat

2641 agggtttcac catgttggcc aggctggtca cgaactcctg acctcaagtg aggtcacccg

2701 cctcggcctc ccgaagtgct gggattgcag atgtgagcca ccatgtccag ccaagaatta

2761 gtatttaaat tttagatact cttttttttt tttttttttt ttttttttga gacagagtct

2821 tgctccatca cccatgctag agtgcagtgg agtgatctcg gctcactgca acttccgcct

2881 tctgggttca agctattctc ctgcctcagc cttccaagta actgggatta caggcatgta

2941 ccaccatacc agctgatttt tttgtatttt tagtaaagac agggtttcac catgttagcc

3001 aggctgatct tgaactccta aactcaagtg atctactcac ctcagcctcc caaaatgctg

3061 ggattacaga tgtgaggcac ctggcctcag atttttgata ctcttaaacc ttctgatcct

3121 tagtttctct ctccaaaata ctctttctag gttaaaaaaa aaaaggctct tatatttggt

3181 gctatgtaaa tgaaaatgtt ttttaggttt tcttgattta acaatagaga cagggtctcc

3241 ctgtgttgcc caggctggtc tcgaactcct gggctcaaga gatcctcctg tcttggcctc

3301 gcaaagtgct aagtaggatt acaggcgtta gccaccacac ccggctgtaa aaatgtactt

3361 attctccagc ctcttttgta taaaccatag taagggatgg gagtaatgat gttatctgtg

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3481 attacatcag gccctttttc acacacaaaa aaatccttta tgggatttaa tggaatctgt

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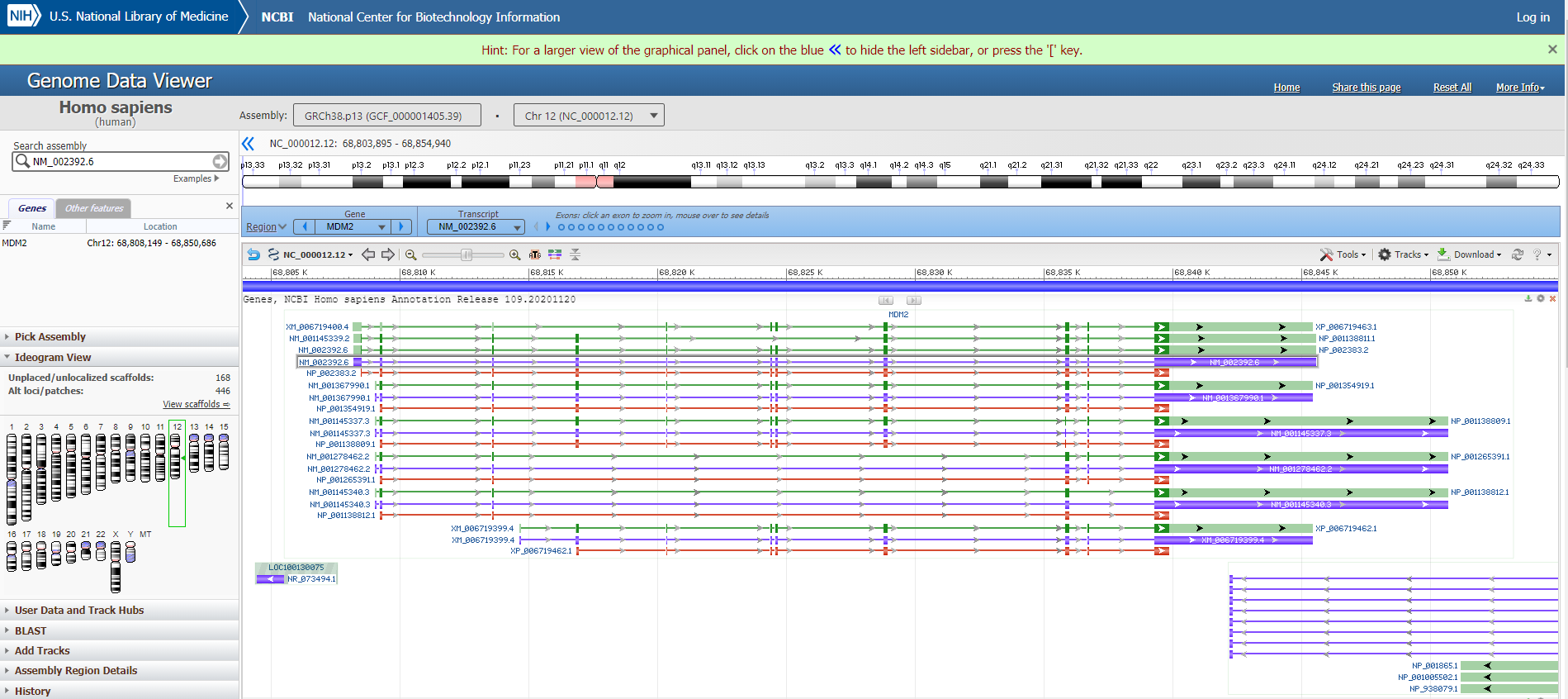
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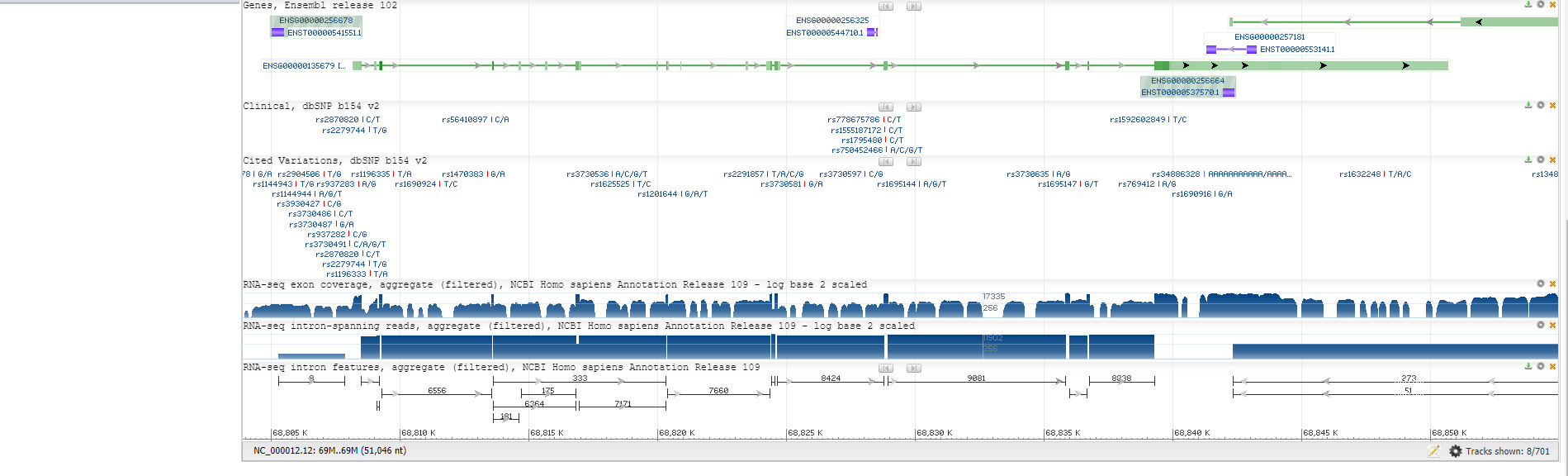
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**Interpretation:**

**1) Summary of Gene:** This gene encodes a nuclear-localized E3 ubiquitin ligase. The encoded protein can promote tumor formation by targeting tumor suppressor proteins, such as p53, for proteasomal degradation. This gene is itself transcriptionally-regulated by p53. Overexpression or amplification of this locus is detected in a variety of different cancers. There is a pseudogene for this gene on chromosome 2. Alternative splicing results in a multitude of transcript variants, many of which may be expressed only in tumor cells. [provided by RefSeq, Jun 2013].

**2) Location**: Chr12: 68,808,149 - 68,850,686





**3) Exon count: 10**

**Exon Locations:** 316..400 | 401..475 | 476..609 | 610..659 | 660..727

728..824 | 825..985 | 986..1141 | 1142..1219 | 1220..7490

**4) Base composition (size):** 7490 bp

**5) Coding Sequence (CDS) length:** 302.. 1795 → 1494 bp