

SARS-CoV-2 GENOME

The genome of SARS-CoV-2 isolate Wuhan-Hu-1 was downloaded from the NCBI. The reference sequence ID is: NC_045512.2. The virus has a genome size of 29,903bp. The annotated genes of the proteins of SARS-CoV-2 are numbered based on the genome of virus.

NSP1: 266-805

```
266                atgga gaggccttgct cctggtttca acgagaaaac
301 acacgtccaa ctcagtttgc ctgttttaca ggttcgcgac gtgctcgtac gtggcctttgg
361 agactccgtg gaggaggtct tatcagaggc acgtcaacat cttaaagatg gcacttgtgg
421 cttagtagaa gttgaaaaag gcgttttgcc tcaacttgaa cagccctatg tgttcatcaa
481 acgttcggat gctcgaactg cacctcatgg tcatgttatg gttgagctgg tagcagaact
541 cgaaggcatt cagtacggtc gtagtgggta gacacttggg gtccttgtcc ctcatgtggg
601 cgaaatacca gtggccttacc gcaagggttct tcttcgtaag aacggtaata aaggagctgg
661 tggccatagt tacggcgccg atctaaagtc atttgactta ggcgacgagc ttggcactga
721 tccttatgaa gattttcaag aaaactggaa cactaaacat agcagtgggtg ttaccctgta
781 actcatgcgt gagcttaacg gaggg
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NSP2: 806-2719

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841 ccctgatggc taccctcttg agtgcattaa agaccttcta gcacgtgctg gtaaagcttc
901 atgcactttg tccgaacaac tggactttat tgacactaag aggggtgtat actgctgccg
961 tgaacatgag catgaaattg cttggtacac ggaacgttct gaaaagagct atgaattgca
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1081 ttttgtatth cccttaaatt ccataatcaa gactattcaa ccaaggggtg aaaagaaaaa
1141 gcttgatggc tttatgggta gaattcgatc tgtctatcca gttgcgtcac caaatgaatg
1201 caaccaaagtg tgcctttcaa ctctcatgaa gtgtgatcat tgtgggtaaa cttcatggca
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1381 atgtcacaat tcagaagtag gacctgagca tagtcttgcc gaataccata atgaatctgg
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2701 cttcacactc aaaggcggg
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NSP3: 2720-8554

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2881 ctgtgtttgtg gcagatgctg tcataaaaaac tttgcaacca gtatctgaat tacttacacc
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8521 thgtthgthaca acaagatag cactthaggg thgtt

NSP4: 8555-10,054

8555 aaaatt gthtaataat ggthgaaagca
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NSP5: 10,055-10,972

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NSP6: 10,973-11,842

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NSP7: 11,843-12,091

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 12061 agaaatgctg gacaacaggg caaccttaca a

NSP8: 12,092-12,685

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NSP9: 12,686-13,024

12686 aataa tgagcttagt cctgttgcac tacgacagat
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 13021 acaa

NSP10: 13,025-13,441

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 13441 g

NSP11: 13,442-13,480

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NSP12: 13,442-16,236

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 13501 ccgtgctgca caggcactag tactgatgtc gtatacaggg cttttgacat ctacaatgat
 13561 aaagtagctg gttttgctaa attcctaaaa actaattgtt gtcgcttcca agaaaaggac
 13621 gaagatgaca atttaattga ttcttacttt gtagttaaga gacacacttt ctctaactac
 13681 caacatgaag aaacaattta taatttactt aaggattgtc cagctgttgc taacatgac

13741 ttctttaagt ttagaataga cgggtgacatg gtaccacata tatcacgtca acgtcttact
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13861 acattaaaag aaatacttgt cacatacaat tgttgtgatg atgattatct caataaaaag
13921 gactgggatg atttttaga aaaccagat atattacgcg tatacgcaa cttaggtgaa
13981 cgtgtacgcc aagctttgtt aaaaacagta caattctgtg atgccatgcg aaatgctggt
14041 attggtggtg tactgacatt agataatcaa gatctcaatg gtaactggta tgatttcggt
14101 gatttcatac aaaccacgcc aggtagtgga gttcctgttg tagattctta ttattcattg
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14761 ttctttgctc aggatggtaa tgcctgctatc agcgattatg actactatcg ttataatcta
14821 ccaacaatgt gtgatatcag acaactacta tttgtagtgt aagttgttga taagtacttt
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14941 tcagctgggt ttccatttaa taaatggggg aaggctagac tttattatga ttcaatgagt
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15061 caaatgaatc ttaagtatgc cattagtgca aagaatagag ctgcaccgt agctgggtgc
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15421 caagtattga gtgaaatggg catgtgtggc ggttcactat atgttaaacc aggtggaacc
15481 tcatcaggag atgccacaac tgcttatgct aatagtgttt ttaacatttg tcaagctgct
15541 acggccaatg ttaatgcact tttatctact gatggtaaca aaattgccga taagtatgct
15601 cgcaatctac aacacagact ttatgagtgt ctctatagaa atagagatgt tgacacagac
15661 tttgtgaatg agttttacgc atatttgcgt aaacatttct caatgatgat actctctgac
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15781 aactttaagt cagttcttta ttatcaaac aatgttttta tgtctgaagc aaaatgttgg
15841 actgagactg accttactaa aggacctcat gaattttgct ctcaacatac aatgctagtt
15901 aaacaggggtg atgattatgt gtaccttctc taccagatc catcaagaat cctaggggcc
15961 ggctgttttg tagatgatat cgtaaaaaca gatggtacac ttatgattga acggttcgtg
16021 tcttttagcta tagatgctta cccacttact aaacatccta atcaggagta tgctgatgct
16081 tttcatttgt acttacaata cataagaaag ctacatgatg agttaacagg acacatgta
16141 gacatgtatt ctgttatgct tactaatgat aacacttcaa ggtattggga acctgagttt
16201 tatgaggcta tgtacacacc gcatacagtc ttacag

NSP13: 16,237-18,039

16237 gctg ttggggcttg tgttctttgc
16261 aattcacaga cttcattaag atgtgggtgct tgcatacgtg gaccattctt atgttgtaaa
16321 tgctgttacg accatgtcat atcaacatca cataaattag tcttgtctgt taatccgtat
16381 gtttgcaatg ctccagggtg tgatgtcaca gatgtgactc aactttactt aggaggatg
16441 agctattatt gtaaatcaca taaaccaccc attagttttc cattgtgtgc taatggacaa
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16681 tatgggtattg ctactgtacg tgaagtgtct tctgacagag aattacatct ttcattggaa
16741 gttggtaaac ctagaccacc acttaaccga aattatgtct ttactgggta tcgtgtaact
16801 aaaaacagta aagtacaaat aggagagtac acctttgaaa aaggtgacta tgggtgatgct

16861	gttgtttacc	gaggtacaac	aacttaca	aa	ttaaatg	gtgattatt	tgtgctgaca
16921	tcacatacag	taatgccatt	aagtgcac	ac	actagtgc	cacaagagca	ctatgtaga
16981	attactggct	tatacccaac	actcaat	tc	cagatgagt	tttctagcaa	tgttgcaaat
17041	tatcaaaagg	ttggtatgca	aaagtatt	ac	actccagg	gaccacctgg	tactggtaag
17101	agtcattttg	ctattggcct	agctctct	ta	cccttctg	ctcgcatagt	gtatacagct
17161	tgctctcatg	ccgctg	ttga	tg	cactatgt	gagaaggcat	taaaatatt
17221	aaatgtagta	gaattata	acc	tg	cacgtgct	cgtgtagagt	gttttgataa
17281	aattcaacat	tagaacag	ta	tg	tctttt	actgtaa	atg
17341	gatatagttg	tctttgat	ga	aa	tttcaatg	gccacaa	atgatttgag
17401	gccagattac	gtgctaag	ca	ct	atgtgtac	attggcgacc	ctgctcaatt
17461	cgcacattgc	taactaagg	gc	ca	actagaa	ccagaatatt	tcaattcagt
17521	atgaaaacta	taggtccaga	ca	tg	ttctc	ggaactgtc	ggcgttgtcc
17581	gctgacactg	tgagtgc	tt	gg	ttatgat	aa	taagctta
17641	gctcaatgct	ttaaaatg	tt	ata	agggt	gttatcacgc	atgatgttc
17701	aacaggccac	aaataggc	gt	gg	taagagaa	ttccttacac	gtaaccctgc
17761	gctgtcttta	tttcacct	ta	aa	ttcacag	aatgctgtag	cctcaaagat
17821	ccaactcaaa	ctgttgat	tc	at	cacagggc	tcagaatag	actatgtcat
17881	accactgaaa	cagctcact	tc	tg	taatgta	aacagattta	atgttgctat
17941	aaagtaggca	tactttgcat	aa	tg	tctgat	agagacctt	atgacaagt
18001	agtcttgaaa	ttccacgtag	ga	aa	tg	ggca	actttaca

NSP14: 18,040-19,620

18040						g ctgaaaatgt	aacaggactc
18061	tttaaagatt	gtagtaagg	aatcactggg	tt	acatccta	cacaggcacc	tacacacctc
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18181	gacatgacct	atagaagact	catctctatg	at	gggtttta	aaatgaatta	tcaagttaat
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18421	cctaataata	cagat	tt	tc	agagtt	agt	gctaaaccac
18481	cacctcatac	cacttatgta	caa	agg	actt	ccttgg	aatg
18541	caa	atgttaa	gtg	acacact	t	aaaaatctc	tctgacagag
18601	catggctttg	agttgacatc	tat	ga	agtat	ttt	gtgaaaa
18661	tgtctatgtg	atagacgtgc	cac	at	gcttt	tccactgctt	cagacactta
18721	catcattcta	ttggatttga	tt	ac	gtctat	aatccgttta	tgattgatgt
18781	ggttttacag	gtaacctaca	aag	ca	acat	gatctgtatt	gtcaagtcca
18841	catgtagcta	gttgtgatgc	aat	cat	gact	aggtgtctag	ctgtccacga
18901	aagcgtg	ttg	act	gg	actat	tgaat	atcct
18961	gctt	gtagaa	agg	tt	caaca	cat	ggtt
19021	gttcttcacg	acattggtaa	cc	ta	aaagct	atta	agtgtg
19081	tgg	aa	gttct	at	gatgcaca	gc	ctt
19141	tattcttatg	ccacacattc	tg	ac	aaattc	ac	agatgg
19201	aatgtcgata	gat	atcctgc	ta	attccatt	gtt	gttagat
19261	aaccttaact	tg	cctgggtg	tg	atgggtggc	ag	ttt
19321	acaccagctt	ttgataaaa	tg	ct	ttt	g	tt
19381	tctgacagtc	catgtgagtc	tc	at	ggaaaa	ca	agtagtgt
19441	ctaaagtctg	ctacgtgtat	aa	ca	cgttgc	aa	tttaggtg
19501	gcta	atgag	ac	ag	attgta	tct	cgatgct
19561	ttgtgggttt	acaaacaatt	tg	ata	cttat	aa	ctctgga

NSP15: 19,621-20,658

19621 agtttagaaa atgtggcttt taatgttgta aataagggac actttgatgg acaacagggg
19681 gaagtaccag tttctatcat taataacact gtttacacaa aagttgatgg tgttgatgta
19741 gaattgtttg aaaataaaac aacattacct gttaatgtag catttgagct ttgggctaag
19801 cgcaacatta aaccagtacc agaggtgaaa atactcaata atttgggtgt ggacattgct
19861 gctaatactg tgatctggga ctacaaaaga gatgctccag cacatatac tactattggg
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20521 gattttgttg aaataataaa atcccaagat ttatctgtag tttctaaggt tgtcaaagtg
20581 actattgact atacagaaat ttcatttatg ctttgggtga aagatggcca tgtagaaaca
20641 ttttacccaa aattacaa

NSP16: 20,659-21,552

20659 tc tagtcaagcg tggcaaccgg gtgttgctat gcctaattctt
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20761 acattacctt aaggcataat gatgaatgct gcaaaatata ctcaactgtg tcaatattta
20821 aacacattaa cattagctgt accctataat atgagagtta tacatthttg tgctggttct
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21301 ccacgcgaac aaatagatgg ttatgtcatg catgcaaatt acatattttg gaggaatata
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21421 aggggtactg ctgttatgtc tttaaaagaa ggtcaaatca atgatatgat tttatctctt
21481 cttagtaaag gtagacttat aattagagaa aacaacagag ttgttatttc tagtgatggt
21541 cttgttaaca ac

Spike (S): 21,563-25,384

21563 atgtttgt ttttcttgtt ttattgccac tagtctctag
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25321 ctgcaaatth gatgaagacg actctgagcc agtgcctcaa ggagtcaaat tacattacac
25381 ataa

ORF7a: 27,394-27,759

27394 atgaaaa ttattctttt cttggcactg
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 27481 cttttaaaag aaccttgctc ttctggaaca tacgagggca attcaccatt tcatcctcta
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 27601 ggcgtaaaac acgtctatca gttacgtgcc agatcagttt cacctaaact gttcatcaga
 27661 caagaggaag ttcaagaact ttactctcca atttttctta ttgttgcggc aatagtgttt
 27721 ataacacttt gcttcacact caaaagaaag acagaatga

ORF7b: 27,756-27,887

27756 atgat tgaactttca ttaattgact
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 27841 ggttctcact tgaactgcaa gatcataatg aaacttgtca cgcctaa

ORF8: 27,894-28,259

27894 atgaaat
 27901 ttcttgtttt cttaggaatc atcacaactg tagctgcatt tcaccaagaa tgtagtttac
 27961 agtcatgtac tcaacatcaa ccatatgtag ttgatgacc gtgtcctatt cacttctatt
 28021 ctaaattggtg tattagagta ggagctagaa aatcagcacc ttttaattgaa ttgtgcgtgg
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 28141 gtttaccttt tacaattaat tgccaggaac ctaaattggg tagtcttgta gtgcgttgtt
 28201 cgttctatga agacttttta gagtatcatg acgttcgtgt tgttttagat tcatcctaa

Nucleocapsid (N): 28,274-29,533

28274 atgtctg ataattggacc caaaaatcag cgaaatgcac cccgcattac
 28321 gtttggtgga ccctcagatt caactggcag taaccagaat ggagaacgca gtggggcgcg
 28381 atcaaaacaa cgtcggcccc aaggtttacc caataatact gcgtcttggt tcaccgctct
 28441 cactcaacat ggcaaggaag accttaaatt ccctcgagga caaggcgctc caattaacac
 28501 caatagcagt ccagatgacc aaattggcta ctaccgaaga gctaccagac gaattcgtgg
 28561 tggtagcggg aaaatgaaag atctcagtc aagatggat ttctactacc taggaactgg
 28621 gccagaagct ggacttccct atggtgctaa caaagacggc atcatatggg ttgcaactga
 28681 gggagccttg aatacaccaa aagatcacat tggcaccgca aatcctgcta acaatgctgc
 28741 aatcgtgcta caacttctc aaggaacaac attgcaaaa ggcttctacg cagaagggag
 28801 cagagggcggc agtcaagcct cttctcgctc ctcatcacgt agtcgcaaca gttcaagaaa
 28861 ttcaactcca ggcagcagta ggggaacttc tctgctaga atggctggca atggcgggta
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29558

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