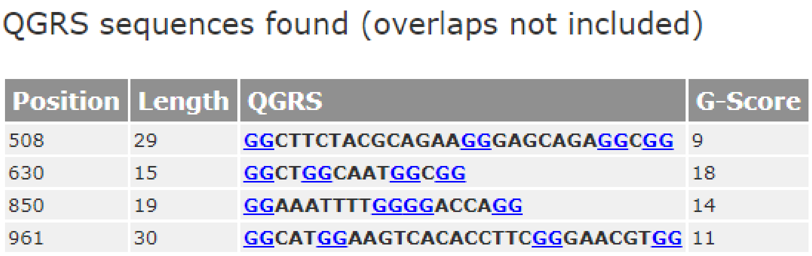
J Genet Resour 2024; 10(1): 1-8 *Homepage: http://sc.journals.umz.ac.ir/*

RESEARCH ARTICLE *DOI: 10.22080/jgr.2024.25850.1370*

Supplement 1. PQS sequences in the N gene of Wuhan-Hu-1: A) Overlap not included; B) overlap included; C) the sequence view of PQSs in the gene.

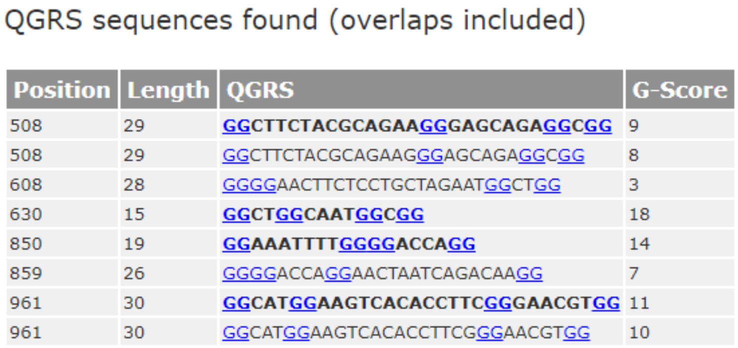
A



QGRS sequences found (overlaps not included)

Position	Length	QGRS	G-Score
508	29	**GGCTTCTACGCAGAAGGGAGCAGAGGCGG**	9
630	15	**GGCTGGCAATGGCGG**	18
850	19	**GGAAATTTTGGGGACCAGG**	14
961	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11

B



QGRS sequences found (overlaps included)

Position	Length	QGRS	G-Score
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608	28	GGGGAACTTCTCCTGCTAGAATGGCTGG	3
630	15	**GGCTGGCAATGGCGG**	18
850	19	**GGAAATTTTGGGGACCAGG**	14
859	26	GGGGACCAGGAACTAATCAGACAAGG	7
961	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11
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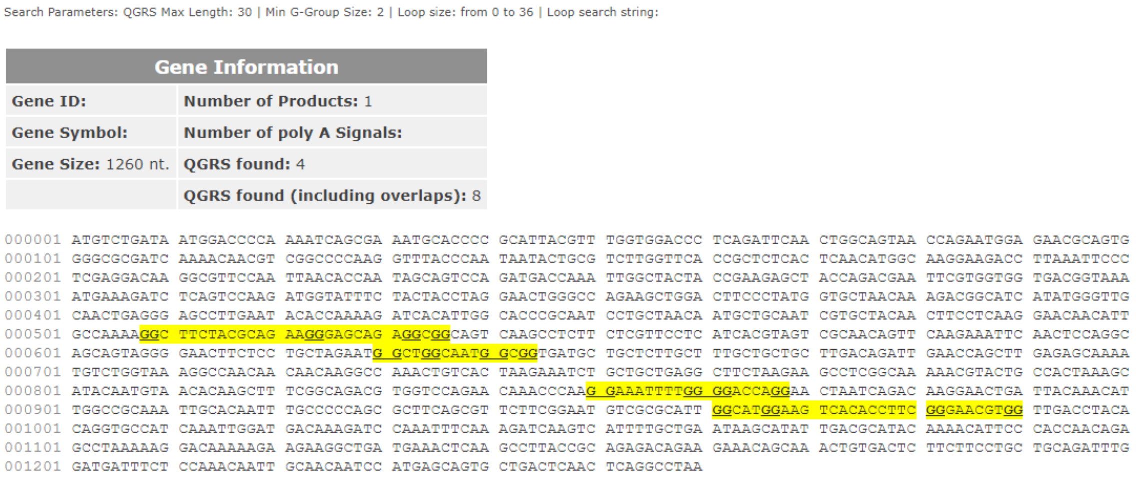

Search Parameters: QGRS Max Length: 30 | Min G-Group Size: 2 | Loop size: from 0 to 36 | Loop search string:

Gene Information	
Gene ID:	**Number of Products:** 1
Gene Symbol:	**Number of poly A Signals:**
Gene Size: 1260 nt.	**QGRS found:** 4
	QGRS found (including overlaps): 8

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001201 GATGATTTCT CCAAACAATT GCAACAATCC ATGAGCAGTG CTGACTCAAC TCAGGCCTAA
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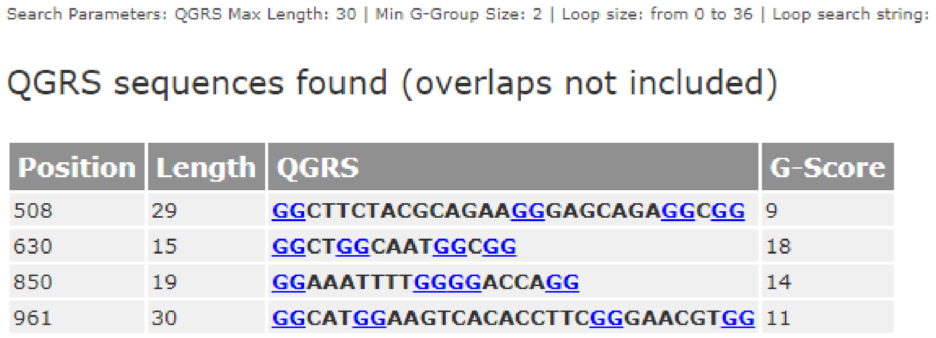
Supplement 2. PQS sequences in the N gene of the Alpha variant: A) Overlap not included; B) overlap included; C) the sequence view of PQSs in the gene.

A



Search Parameters: QGRS Max Length: 30 | Min G-Group Size: 2 | Loop size: from 0 to 36 | Loop search string:

QGRS sequences found (overlaps not included)

Position	Length	QGRS	G-Score
508	29	**GGCTTCTACGCAGAAGGGAGCAGAGGCGG**	9
630	15	**GGCTGGCAATGGCGG**	18
850	19	**GGAAATTTTGGGGACCAGG**	14
961	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11

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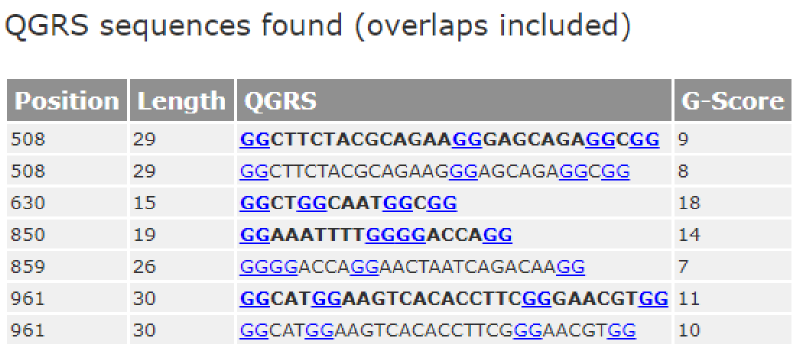

QGRS sequences found (overlaps included)

Position	Length	QGRS	G-Score
508	29	**GGCTTCTACGCAGAAGGGAGCAGAGGCGG**	9
508	29	GGCTTCTACGCAGAAGGGAGCAGAGGCGG	8
630	15	**GGCTGGCAATGGCGG**	18
850	19	**GGAAATTTTGGGGACCAGG**	14
859	26	GGGGACCAGGAACTAATCAGACAAGG	7
961	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11
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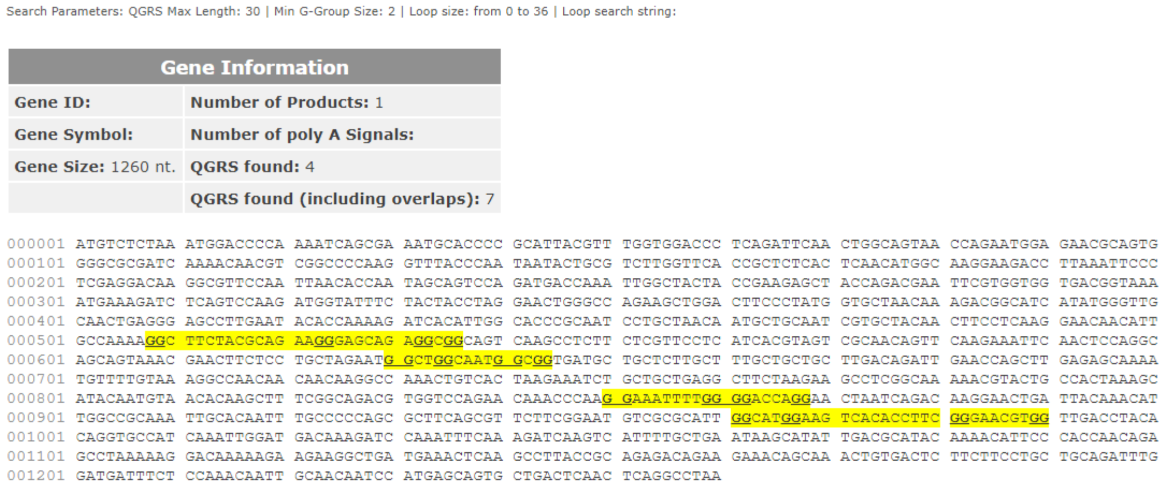

Search Parameters: QGRS Max Length: 30 | Min G-Group Size: 2 | Loop size: from 0 to 36 | Loop search string:

Gene Information	
Gene ID:	**Number of Products:** 1
Gene Symbol:	**Number of poly A Signals:**
Gene Size: 1260 nt.	**QGRS found:** 4
	QGRS found (including overlaps): 7

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001201 GATGATTTCT CCAAACAATT GCAACAATCC ATGAGCAGTG CTGACTCAAC TCAGGCCTAA
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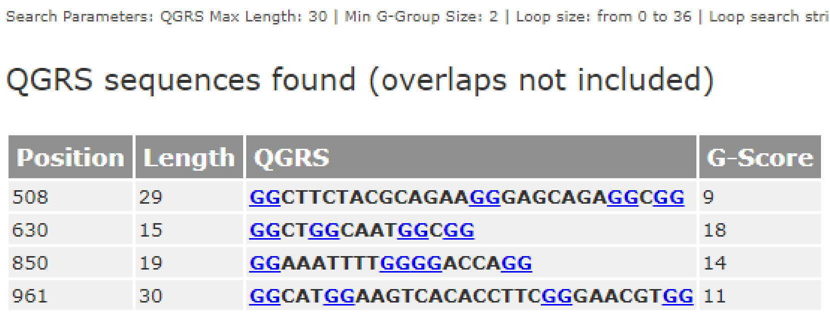
Supplement 3. PQS sequences in the N gene of the Bata variant: A) Overlap not included; B) overlap included; C) the sequence view of PQSs in the gene.

A



Search Parameters: QGRS Max Length: 30 | Min G-Group Size: 2 | Loop size: from 0 to 36 | Loop search string:

QGRS sequences found (overlaps not included)

Position	Length	QGRS	G-Score
508	29	GGCTTCTACGCAGAAGGGAGCAGAGGCGG	9
630	15	GGCTGGCAATGGCGG	18
850	19	GGAAATTTTGGGGACCAGG	14
961	30	GGCATGGAAGTCACACCTTCGGGAACGTGG	11

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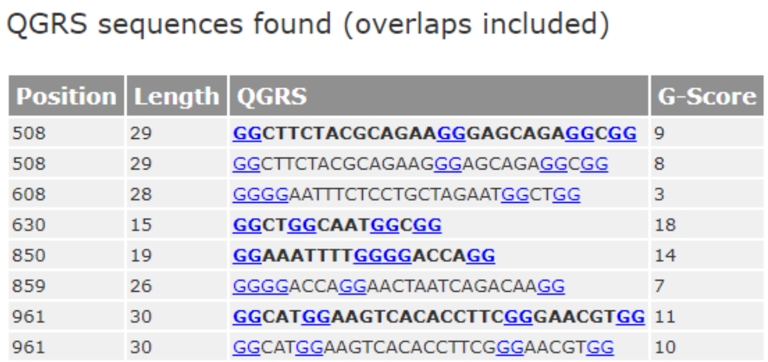

QGRS sequences found (overlaps included)

Position	Length	QGRS	G-Score
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508	29	GGCTTCTACGCAGAAGGGAGCAGAGGCGG	8
608	28	GGGGAATTTCTCCTGCTAGAATGGCTGG	3
630	15	GGCTGGCAATGGCGG	18
850	19	GGAAATTTTGGGGACCAGG	14
859	26	GGGGACCAGGAACTAATCAGACAAGG	7
961	30	GGCATGGAAGTCACACCTTCGGGAACGTGG	11
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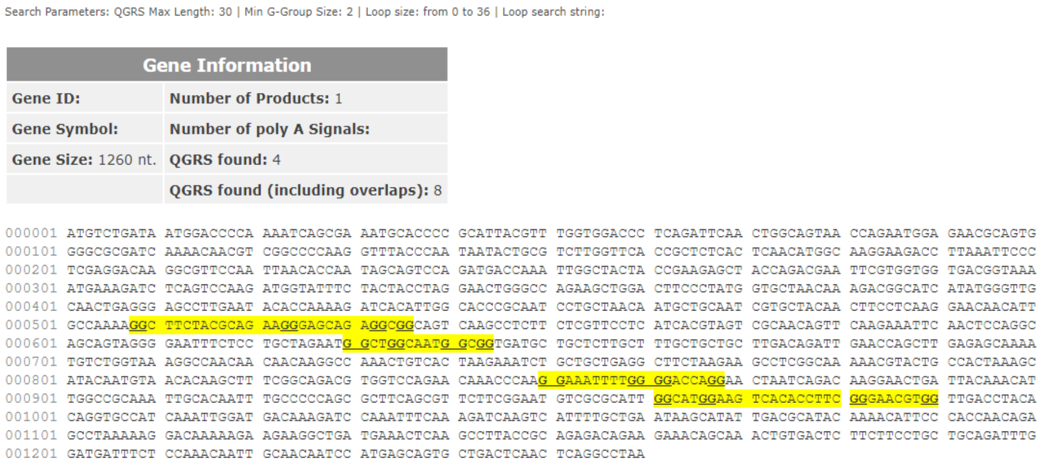

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Gene Information	
Gene ID:	**Number of Products:** 1
Gene Symbol:	**Number of poly A Signals:**
Gene Size: 1260 nt.	**QGRS found:** 4
	QGRS found (including overlaps): 8

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001201 GATGATTTCT CCAAACAATT GCAACAATCC ATGAGCAGTG CTGACTCAAC TCAGGCCTAA
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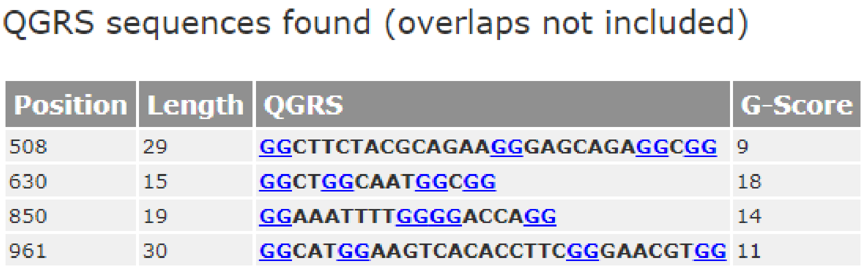
Supplement 4. PQS sequences in the N gene of the Gamma variant: A) Overlap not included; B) overlap included; C) the sequence view of PQSs in the gene.

A



QGRS sequences found (overlaps not included)

Position	Length	QGRS	G-Score
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630	15	**GGCTGGCAATGGCGG**	18
850	19	**GGAAATTTTGGGGACCAGG**	14
961	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11

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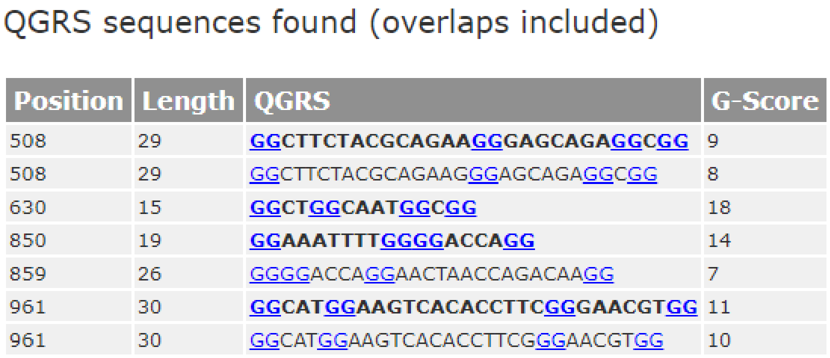

QGRS sequences found (overlaps included)

Position	Length	QGRS	G-Score
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630	15	**GGCTGGCAATGGCGG**	18
850	19	**GGAAATTTTGGGGACCAGG**	14
859	26	GGGGACCAGGAACTAACCAGACAAGG	7
961	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11
961	30	GGCATGGAAGTCACACCTTCGGGAACGTGG	10

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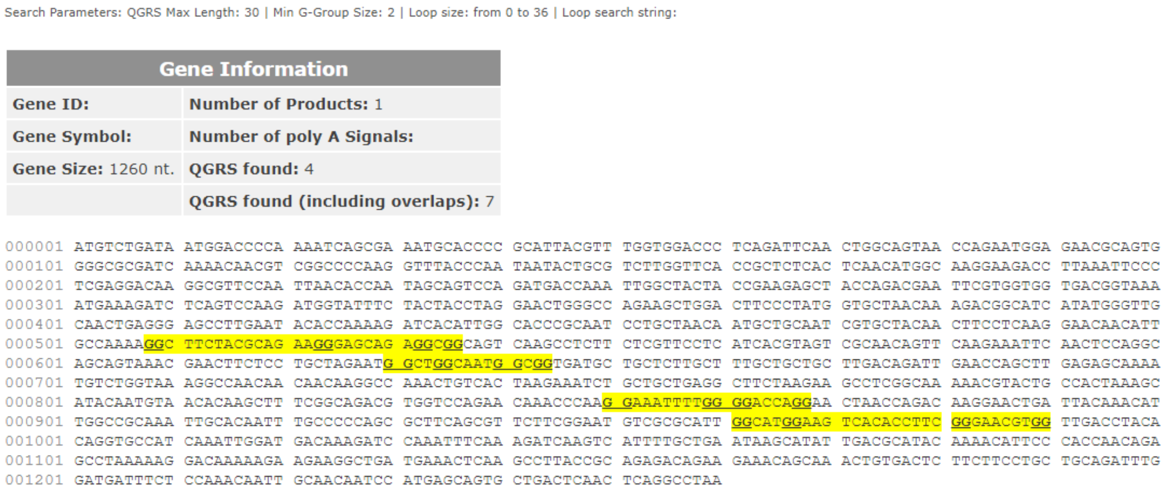

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Gene Information	
Gene ID:	**Number of Products:** 1
Gene Symbol:	**Number of poly A Signals:**
Gene Size: 1260 nt.	**QGRS found:** 4
	QGRS found (including overlaps): 7

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Supplement 5. PQS sequences in the N gene of Delta variant: A) Overlap not included; B) overlap included; C) the sequence view of PQSs in the gene.

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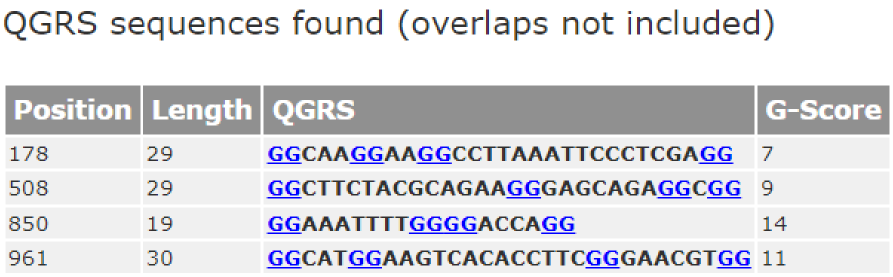

QGRS sequences found (overlaps not included)

Position	Length	QGRS	G-Score
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508	29	**GGCTTCTACGCAGAAGGGAGCAGAGGCGG**	9
850	19	**GGAAATTTTGGGGACCAGG**	14
961	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11

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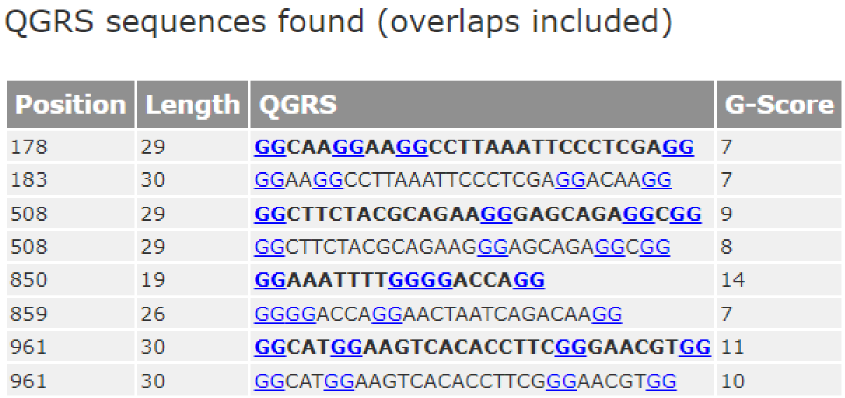

QGRS sequences found (overlaps included)

Position	Length	QGRS	G-Score
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508	29	**GGCTTCTACGCAGAAGGGAGCAGAGGCGG**	9
508	29	GGCTTCTACGCAGAAGGGAGCAGAGGCGG	8
850	19	**GGAAATTTTGGGGACCAGG**	14
859	26	GGGGACCAGGAACTAATCAGACAAGG	7
961	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11
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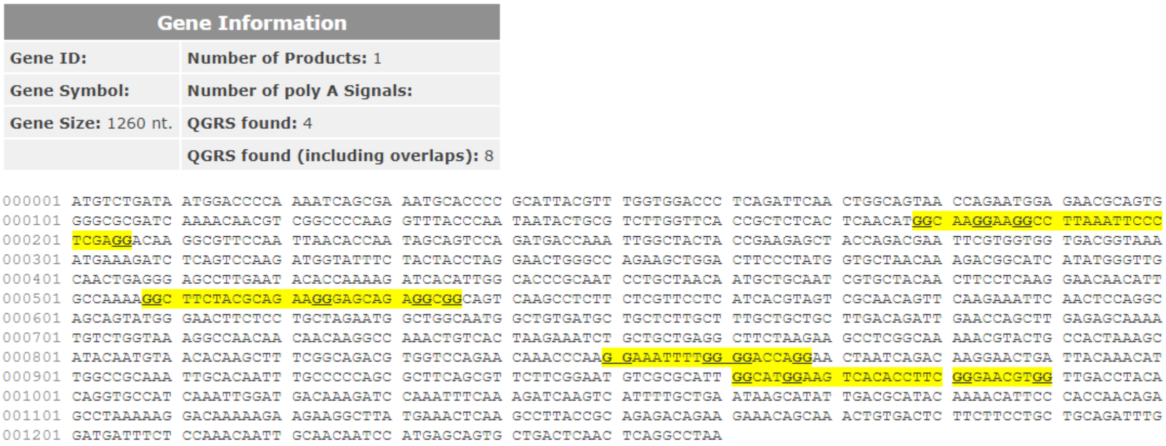

Gene Information	
Gene ID:	**Number of Products:** 1
Gene Symbol:	**Number of poly A Signals:**
Gene Size: 1260 nt.	**QGRS found:** 4
	QGRS found (including overlaps): 8

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001201 GATGATTTCT CCAAACAATT GCAACAATCC ATGAGCAGTG CTGACTCAAC TCAGGCCTAA
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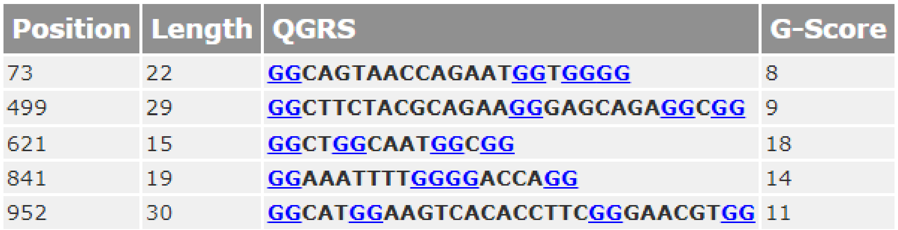
Supplement 6. PQS sequences in N gene of Omicron variant: A) Overlap not included; B) overlap included; C) the sequence view of PQSs in the gene.

A



Position	Length	QGRS	G-Score
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499	29	GGCTTCTACGCAGAAGGGAGCAGAGGCGG	9
621	15	GGCTGGCAATGGCGG	18
841	19	GGAAATTTTGGGGACCAGG	14
952	30	GGCATGGAAGTCACACCTTCGGGAACGTGG	11

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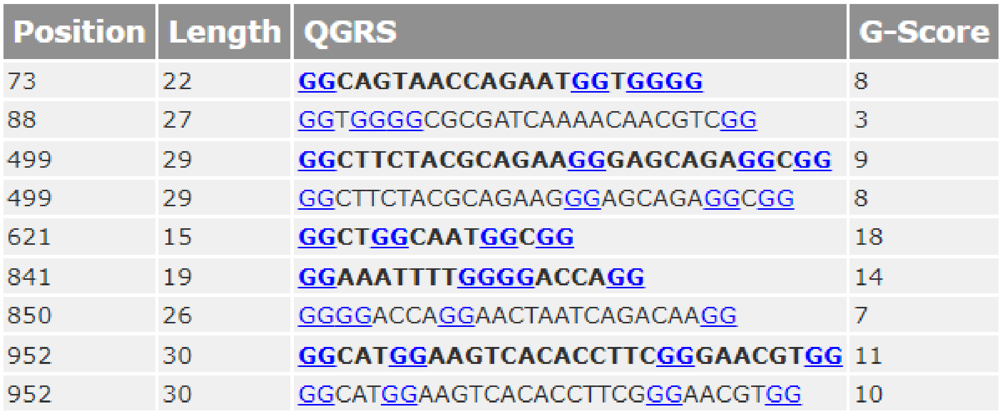

Position	Length	QGRS	G-Score
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621	15	**GGCTGGCAATGGCGG**	18
841	19	**GGAAATTTTGGGGACCAGG**	14
850	26	GGGGACCAGGAACTAATCAGACAAGG	7
952	30	**GGCATGGAAGTCACACCTTCGGGAACGTGG**	11
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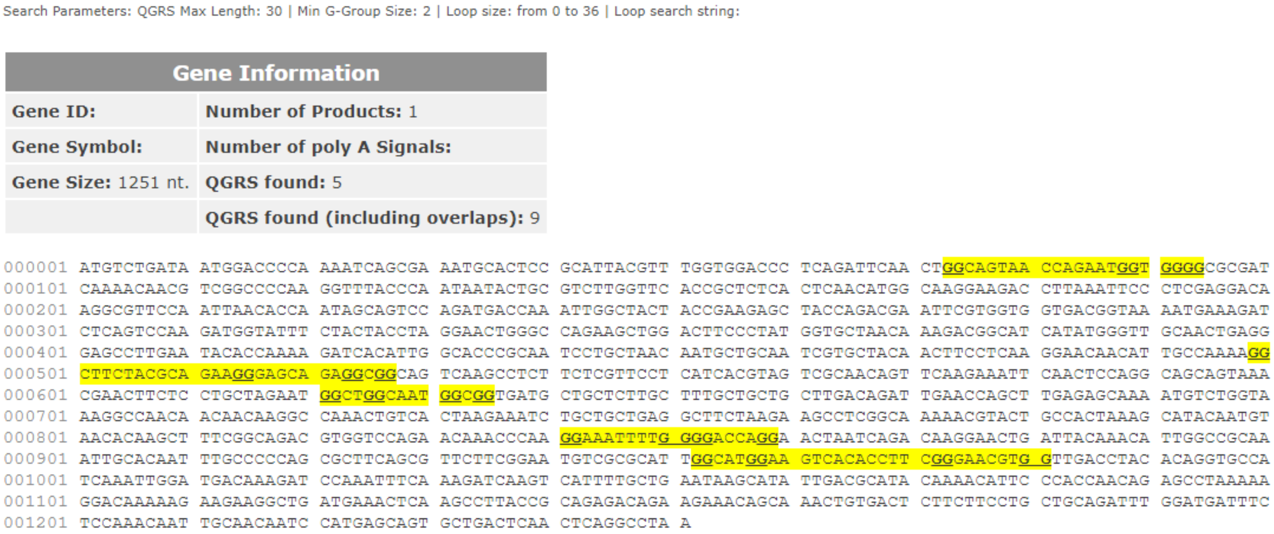

Search Parameters: QGRS Max Length: 30 | Min G-Group Size: 2 | Loop size: from 0 to 36 | Loop search string:

Gene Information	
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Gene Symbol:	**Number of poly A Signals:**
Gene Size: 1251 nt.	**QGRS found:** 5
	QGRS found (including overlaps): 9

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000001 ATGTCTGATA ATGGACCCCA AAATCAGCGA AATGCACTCC GCATTACGTT TGGTGGACCC TCAGATTCAA CTGGCAGTAA CCAGAATGGT GGGGCGCGAT
000101 CAAAACAACG TCGGCCCCAA GGTTTACCCA ATAATACTGC GTCTTGGTTC ACCGCTCTCA CTCAACATGG CAAGGAAGAC CTTAAATTCC CTCGAGGACA
000201 AGGCGTTCCA ATTAACACCA ATAGCAGTCC AGATGACCAA ATTGGCTACT ACCGAAGAGC TACCAGACGA ATTCGTGGTG GTGACGGTAA AATGAAAGAT
000301 CTCAGTCCAA GATGGTATTT CTACTACCTA GGAACTGGGC CAGAAGCTGG ACTTCCCTAT GGTGCTAACA AAGACGGCAT CATATGGGTT GCAACTGAGG
000401 GAGCCTTGAA TACACCAAAA GATCACATTG GCACCCGCAA TCCTGCTAAC AATGCTGCAA TCGTGCTACA ACTTCCTCAA GGAACAACAT TGCCAAAAGG
000501 CTTCTACGCA GAAGGGAGCA GAGGCGGCAG TCAAGCCTCT TCTCGTTCCT CATCACGTAG TCGCAACAGT TCAAGAAATT CAACTCCAGG CAGCAGTAAA
000601 CGAACTTCTC CTGCTAGAAT GGCTGGCAAT GGCGGTGATG CTGCTCTTGC TTTGCTGCTG CTTGACAGAT TGAACCAGCT TGAGAGCAAA ATGTCTGGTA
000701 AAGGCCAACA ACAACAAGGC CAAACTGTCA CTAAGAAATC TGCTGCTGAG GCTTCTAAGA AGCCTCGGCA AAAACGTACT GCCACTAAAG CATACAATGT
000801 AACACAAGCT TTCGGCAGAC GTGGTCCAGA ACAAACCCAA GGAAATTTTG GGGACCAGGA ACTAATCAGA CAAGGAACTG ATTACAAACA TTGGCCGCAA
000901 ATTGCACAAT TTGCCCCCAG CGCTTCAGCG TTCTTCGGAA TGTCGCGCAT TGGCATGGAA GTCACACCTT CGGGAACGTG GTTGACCTAC ACAGGTGCCA
001001 TCAAATTGGA TGACAAAGAT CCAAATTTCA AAGATCAAGT CATTTTGCTG AATAAGCATA TTGACGCATA CAAAACATTC CCACCAACAG AGCCTAAAAA
001101 GGACAAAAAG AAGAAGGCTG ATGAAACTCA AGCCTTACCG CAGAGACAGA AGAAACAGCA AACTGTGACT CTTCTTCCTG CTGCAGATTT GGATGATTTC
001201 TCCAAACAAT TGCAACAATC CATGAGCAGT GCTGACTCAA CTCAGGCCTA A
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Supplement 7. The N gene and amino acid sequence in the Delta variant: A) N gene sequences (28247-29506); B) N protein amino acid sequences (1-419)

A

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                                                                  atgt ctgataatgg
28261 accccaaaat cagcgaaatg caccccgcat tacgtttggt ggaccctcag attcaactgg
28321 cagtaaccag aatggagaac gcagtggggc gcgatcaaaa caacgtcggc cccaaggttt
28381 acccaataat actgcgtctt ggttcaccgc tctcactcaa catggcaagg aaggccttaa
28441 attccctcga ggacaaggcg ttccaattaa caccaatagc agtccagatg accaaattgg
28501 ctactaccga agagctacca gacgaattcg tggtggtgac ggtaaaatga aagatctcag
28561 tccaagatgg tatttctact acctaggaac tgggccagaa gctggacttc cctatggtgc
28621 taacaaagac ggcatcatat gggttgcaac tgagggagcc ttgaatacac caaaagatca
28681 cattggcacc cgcaatcctg ctaacaatgc tgcaatcgtg ctacaacttc ctcaaggaac
28741 aacattgcca aaaggcttct acgcagaagg gagcagaggc ggcagtcaag cctcttctcg
28801 ttcctcatca cgtagtcgca acagttcaag aaattcaact ccaggcagca gtatgggaac
28861 ttctcctgct agaatggctg tcaatggctg tgatgctgct cttgctttgc tgctgcttga
28921 cagattgaac cagcttgaga gcaaaatgtc tggtaaaggc caacaacaac aaggccaaac
28981 tgtcactaag aaatctgctg ctgaggcttc taagaagcct cggcaaaaac gtactgccac
29041 taaagcatac aatgtaacac aagctttcgg cagacgtggt ccagaacaaa cccaaggaaa
29101 ttttggggac caggaactaa tcagacaagg aactgattac aaacattggc cgcaaattgc
29161 acaatttgcc cccagcgctt cagcgttctt cggaatgtcg cgcattggca tggaagtcac
29221 accttcggga acgtggttga cctacacagg tgccatcaaa ttggatgaca aagatccaaa
29281 tttcaaagat caagtcattt tgctgaataa gcatattgac gcatacaaaa cattcccacc
29341 aacagagcct aaaaaggaca aaaagaagaa ggcttatgaa actcaagcct taccgcagag
29401 acagaagaaa cagcaaactg tgactcttct tcctgctgca gatttggatg atttctccaa
29461 acaattgcaa caatccatga gcagtgctga ctcaactcag gcctaa
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B

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   1-44 MSDNGPQNQRNAPRITFGGPSDSTGSNQNGERSGARSKQRRPQG

 45-102 LPNNTASWFTALTQHGKEGLKFPRGQGVPINTNSSPDDQIGYYRRATRRIRGGDGKMK
103-160 DLSPRWYFYYLGTGPEAGLPYGANKDGIIWVATEGALNTPKDHIGTRNPANNAAIVLQ

161-218 LPQGTTLPKGFYAEGSRGGSQASSRSSSRSRNSSRNSTPGSSMGTSPARMAGNGCDAA
219-276 LALLLLDRLNQLESKMSGKGQQQQGQTVTKKSAAEASKKPRQKRTATKAYNVTQAFGR
277-334 RGPEQTQGNFGDQELIRQGTDYKHWPQIAQFAPSASAFFGMSRIGMEVTPSGTWLTYT

335-392 GAIKLDDKDPNFKDQVILLNKHIDAYKTFPPTEPKKDKKKKAYETQALPQRQKKQQTV

393-419 TLLPAADLDDFSKQLQQSMSSADSTQA
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