PB2 (2341 bp)

## Nature: cRNA 5’ 🡪 3’

## Source: DQ486029.1 Influenza A virus (A/Moscow/10/99(H3N2)) polymerase PB2

AGCGAAAGCAGGTCAATTATATTCAGTATGGAAAGAATAAAAGAACTACGGAACCTGATGTCGCAGTCTC

GCACTCGCGAGATACTAACAAAAACCACAGTGGACCATATGGCCATAATTAAGAAGTACACATCAGGGAG

ACAGGAAAAGAACCCGTCACTTAGGATGAAATGGATGATGGCAATGAAATACCCAATCACTGCTGACAAA

AGGATAACAGAAATGGTTCCGGAGAGAAATGAACAAGGACAAACTCTATGGAGTAAAATGAGTGATGCTG

GATCAGATCGAGTGATGGTATCACCTTTGGCTGTGACATGGTGGAATAGAAATGGACCCGTGACAAGTAC

GGTCCACTACCCAAAAGTATACAAGACTTATTTTGACAAAGTCGAAAGGTTAAAACATGGAACCTTTGGC

CCTGTTCATTTTAGAAATCAAGTCAAGATACGCCGAAGAGTAGACATAAACCCTGGTCATGCAGACCTCA

GTGCCAAGGAGGCACAAGATGTAATTATGGAAGTTGTTTTTCCCAATGAAGTGGGAGCCAGGATACTAAC

ATCAGAATCACAATTAACAATAACTAAAGAGAAAAAAGAAGAACTCCGAGATTGCAAAATTTCTCCCTTG

ATGGTTGCATACATGTTAGAGAGAGAACTTGTCCGAAAAACAAGATTTCTCCCAGTTGCTGGCGGAACAA

GCAGTATATACATTGAAGTTTTACATTTGACTCAAGGAACGTGTTGGGAACAAATGTACACTCCAGGTGG

AGAAGTGAGGAATGACGATGTTGACCAAAGCCTAATTATTGCAGCCAGGAACATAGTAAGAAGAGCCGCA

GTATCAGCAGATCCACTAGCATCTTTATTGGAGATGTGCCACAGCACACAAATTGGCGGGACAAGGATGG

TGGACATTCTTAGGCAGAACCCGACTGAAGAACAAGCTGTGGATATATGCAAGGCTGCAATGGGATTGAG

AATCAGCTCATCCTTCAGCTTTGGTGGATTTACATTTAAAAGAACAAGCGGGTCATCAGTCAAAAGAGAG

GAAGAAGTGCTTACAGGCAATCTCCAAACATTGAAAATAAGAGTACATGAGGGGTATGAGGAGTTCACAA

TGGTGGGGAAAAGAGCAACAGCTATACTCAGAAAAGCAACCAGGAGATTGGTTCAGCTCATAGTGAGTGG

AAGGGACGAACAGTCAATAGCCGAAGCAATAATCGTGGCCATGGTGTTTTCACAAGAGGATTGCATGATA

AAAGCAGTTAGAGGTGACCTGAATTTCGTCAACAGAGCAAATCAGCGGTTGAACCCCATGCATCAGCTTT

TAAGGCATTTTCAGAAAGATGCGAAAGTGCTTTTTCAGAATTGGGGAATTGAACACATCGACAGTGTGAT

GGGAATGGTTGGAGTATTACCAGATATGACCCCAAGCACAGAGATGTCAATGAGAGGAATAAGAGTCAGC

AAAATGGGTGTGGATGAATACTCCAGTACAGAGAGGGTGGTGGTTAGCATTGATCGGTTTTTGAGAGTTC

GAGACCAACGCGGGAATGTATTATTATCTCCTGAGGAGGTCAGTGAAACACAGGGAACAGAGAGACTGAC

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TGGATCATCAGAAATTGGGAAGCTGTCAAAATTCAATGGTCTCAGAATCCTGCAATGTTGTACAACAAAA

TGGAATTTGAACCATTTCAATCTTTAGTCCCTAAGGCAATTAGAGGCCAATACAGTGGGTTTGTCAGAAC

TCTATTCCAACAAATGAGAGATGTACTTGGGACATTTGACACCACCCAGATAATAAAGCTTCTCCCTTTT

GCAGCCGCTCCACCAAAGCAAAGCAGAATGCAGTTCTCTTCATTGACTGTAAATGTGAGGGGATCAGGGA

TGAGAATACTTGTAAGGGGCAATTCTCCTGTATTCAACTACAACAAGACCACTAAAAGACTAACAATTCT

CGGAAAAGATGCCGGCACTTTAATTGAAGACCCAGATGAAAGCACATCCGGAGTGGAGTCCGCTGTCTTG

AGAGGATTTCTCATTATAGGTAAGGAAGACAGAAGATACGGACCAGCATTAAGCATCAATGAACTGAGTA

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ACGGGACTCTAGCATACTTACTGACAGCCAGACAGCGACCAAAAGAATTCGGATGGCCATCAATTAATGT

TGAATAGTTTAAAAACGACCTTGTTTCTACT

PB2 protein

## Source: [ABE96828.1](https://www.ncbi.nlm.nih.gov/protein/92918927) (759 aa) polymerase PB2

MERIKELRNLMSQSRTREILTKTTVDHMAIIKKYTSGRQEKNPSLRMKWMMAMKYPITADKRITEMVPER

NEQGQTLWSKMSDAGSDRVMVSPLAVTWWNRNGPVTSTVHYPKVYKTYFDKVERLKHGTFGPVHFRNQVK

IRRRVDINPGHADLSAKEAQDVIMEVVFPNEVGARILTSESQLTITKEKKEELRDCKISPLMVAYMLERE

LVRKTRFLPVAGGTSSIYIEVLHLTQGTCWEQMYTPGGEVRNDDVDQSLIIAARNIVRRAAVSADPLASL

LEMCHSTQIGGTRMVDILRQNPTEEQAVDICKAAMGLRISSSFSFGGFTFKRTSGSSVKREEEVLTGNLQ

TLKIRVHEGYEEFTMVGKRATAILRKATRRLVQLIVSGRDEQSIAEAIIVAMVFSQEDCMIKAVRGDLNF

VNRANQRLNPMHQLLRHFQKDAKVLFQNWGIEHIDSVMGMVGVLPDMTPSTEMSMRGIRVSKMGVDEYSS

TERVVVSIDRFLRVRDQRGNVLLSPEEVSETQGTERLTITYSSSMMWEINGPESVLVNTYQWIIRNWEAV

KIQWSQNPAMLYNKMEFEPFQSLVPKAIRGQYSGFVRTLFQQMRDVLGTFDTTQIIKLLPFAAAPPKQSR

MQFSSLTVNVRGSGMRILVRGNSPVFNYNKTTKRLTILGKDAGTLIEDPDESTSGVESAVLRGFLIIGKE

DRRYGPALSINELSNLAKGEKANVLIGQGDVVLVMKRKRDSSILTDSQTATKRIRMAIN

PB2 (2341 bp)

## Nature: vRNA

## Source: Illumina sequences from virus stocks\_RPS\_2022

NNNNNNAGCAGGTCAATTATATTCAGTATGGAAAGAATAAAAGAACTACGGAACCTGATGTCGCAGTCTCGCACTCGCGAGATACTAACAAAAACCACAGTGGACCATATGGCCATAATTAAGAAGTACACATCAGGGAGACAGGAAAAGAACCCGTCACTTAGGATGAAATGGATGATGGCAATGAAATACCCAATCACTGCTGACAAAAGGATAACAGAAATGGTTCCGGAGAGAAATGAACAAGGACAAACTCTATGGAGTAAAATGAGTGATGCTGGATCAGATCGAGTGATGGTATCACCTTTGGCTGTGACATGGTGGAATAGAAATGGACCCGTGACAAGTACGGTCCACTACCCAAAAGTATACAAGACTTATTTTGACAAAGTCGAAAGGTTAAAACATGGAACCTTTGGCCCTGTTCATTTTAGAAATCAAGTCAAGATACGCCGAAGAGTAGACATAAACCCTGGTCATGCAGACCTCAGTGCCAAGGAGGCACAAGATGTAATTATGGAAGTTGTTTTTCCCAATGAAGTGGGAGCCAGGATACTAACATCAGAATCACAATTAACAATAACTAAAGAGAAAAAAGAAGAACTCCGAGATTGCAAAATTTCTCCCTTGATGGTTGCATACATGTTAGAGAGAGAACTTGTCCGAAAAACAAGATTTCTCCCAGTTGCTGGCGGAACAAGCAGTATATACATTGAAGTTTTACATTTGACTCAAGGAACGTGTTGGGAACAAATGTACACTCCAGGTGGAGAAGTGAGGAATGACGATGTTGACCAAAGCCTAATTATTGCAGCCAGGAACATAGTAAGAAGAGCCGCAGTATCAGCAGATCCACTAGCATCTTTATTGGAGATGTGCCACAGCACACAAATTGGCGGGACAAGGATGGTGGACATTCTTAGGCAGAACCCGACTGAAGAACAAGCTGTGGATATATGCAAGGCTGCAATGGGGTTGAGAATCAGCTCATCCTTCAGCTTTGGTGGATTTACATTTAAAAGAACAAGCGGGTCATCAGTCAAAAGAGAGGAAGAAGTGCTTACAGGCAATCTCCAAACATTGAAAATAAGAGTACATGAGGGGTATGAGGAGTTCACAATGGTGGGGAAAAGAGCAACAGCTATACTCAGAAAAGCAACCAGGAGATTGGTTCAGCTCATAGTGAGTGGAAGGGACGAACAGTCAATAGCCGAAGCAATAATCGTGGCCATGGTGTTTTCACAAGAGGATTGCATGATAAAAGCAGTTAGAGGTGACCTGAATTTCGTCAACAGAGCAAATCAGCGGTTGAACCCCATGCATCAGCTTTTAAGGCATTTTCAGAAAGATGCGAAAGTGCTTTTTCAGAATTGGGGAATTGAACACATCGACAGTGTGATGGGAATGGTTGGAGTATTACCAGATATGACTCCAAGCACAGAGATGTCAATGAGAGGAATAAGAGTCAGCAAAATGGGTGTGGATGAATACTCCAGTACAGAGAGGGTGGTGGTTAGCATTGATCGGTTTTTGAGAGTTCGAGACCAACGCGGGAATGTATTATTATCTCCTGAGGAGGTCAGTGAAACACAGGGAACAGAGAGACTGACAATAACTTATTCATCGTCAATGATGTGGGAGATTAACGGTCCTGAGTCGGTTTTGGTCAATACCTATCAATGGATCATCAGAAATTGGGAAGCTGTCAAAATTCAATGGTCTCAGAATCCTGCAATGTTGTACAACAAAATGGAATTTGAACCATTTCAATCTTTAGTCCCTAAGGCCATTAGAGGCCAATACAGTGGGTTTGTCAGAACTCTATTCCAACAAATGAGAGATGTACTTGGGACATTTGACACCACCCAGATAATAAAGCTTCTCCCTTTTGCAGCCGCTCCACCAAAGCAAAGCAGAATGCAGTTCTCTTCATTGACTGTAAATGTGAGGGGATCAGGGATGAGAATACTTGTAAGGGGCAATTCTCCTGTATTCAACTACAACAAGACCACTAAAAGACTAACAATTCTCGGAAAAGATGCCGGCACTTTAATTGAAGACCCAGATGAAAGCACATCCGGAGTGGAGTCCGCTGTCTTGAGAGGATTTCTCATTATAGGTAAGGAAGACAGAAGATACGGACCGGCATTAAGCATCAATGAACTGAGTAACCTTGCAAAAGGGGAAAAAGCTAATGTGCTAATCGGGCAAGGAGACGTGGTGTTGGTAATGAAACGAAAACGGGACTCTAGCATACTTACTGACAGCCAGACAGCGACCAAAAGAATTCGGATGGCCATCAATTAATGTTGAATAGTTTAAAAACGACCTNNNNNNNNNN

PB2 (2341 bp)

## Nature: cDNA\_pHW2000

## Source: GATC sequences from Maxiprep\_RPS\_2023

AGCGAAAGCAGGTCAATTATATTCAGTATGGAAAGAATAAAAGAACTACGGAACCTGATGTCGCAGTCTCGCACTCGCGAGATACTAACAAAAACCACAGTGGACCATATGGCCATAATTAAGAAGTACACATCAGGGAGACAGGAAAAGAACCCGTCACTTAGGATGAAATGGATGATGGCAATGAAATACCCAATCACTGCTGACAAAAGGATAACAGAAATGGTTCCGGAGAGAAATGAACAAGGACAAACTCTATGGAGTAAAATGAGTGATGCTGGATCAGATCGAGTGATGGTATCACCTTTGGCTGTGACATGGTGGAATAGAAATGGACCCGTGACAAGTACGGTCCACTACCCAAAAGTATACAAGACTTATTTTGACAAAGTCGAAAGGTTAAAACATGGAACCTTTGGCCCTGTTCATTTTAGAAATCAAGTCAAGATACGCCGAAGAGTAGACATAAACCCTGGTCATGCAGACCTCAGTGCCAAGGAGGCACAAGATGTAATTATGGAAGTTGTTTTTCCCAATGAAGTGGGAGCCAGGATACTAACATCAGAATCACAATTAACAATAACTAAAGAGAAAAAAGAAGAACTCCGAGATTGCAAAATTTCTCCCTTGATGGTTGCATACATGTTAGAGAGAGAACTTGTCCGAAAAACAAGATTTCTCCCAGTTGCTGGCGGAACAAGCAGTATATACATTGAAGTTTTACATTTGACTCAAGGAACGTGTTGGGAACAAATGTACACTCCAGGTGGAGAAGTGAGGAATGACGATGTTGACCAAAGCCTAATTATTGCAGCCAGGAACATAGTAAGAAGAGCCGCAGTATCAGCAGATCCACTAGCATCTTTATTGGAGATGTGCCACAGCACACAAATTGGCGGGACAAGGATGGTGGACATTCTTAGGCAGAACCCGACTGAAGAACAAGCTGTGGATATATGCAAGGCTGCAATGGGGTTGAGAATCAGCTCATCCTTCAGCTTTGGTGGATTTACATTTAAAAGAACAAGCGGGTCATCAGTCAAAAGAGAGGAAGAAGTGCTTACAGGCAATCTCCAAACATTGAAAATAAGAGTACATGAGGGGTATGAGGAGTTCACAATGGTGGGGAAAAGAGCAACAGCTATACTCAGAAAAGCAACCAGGAGATTGGTTCAGCTCATAGTGAGTGGAAGGGACGAACAGTCAATAGCCGAAGCAATAATCGTGGCCATGGTGTTTTCACAAGAGGATTGCATGATAAAAGCAGTTAGAGGTGACCTGAATTTCGTCAACAGAGCAAATCAGCGGTTGAACCCCATGCATCAGCTTTTAAGGCATTTTCAGAAAGATGCGAAAGTGCTTTTTCAGAATTGGGGAATTGAACACATCGACAGTGTGATGGGAATGGTTGGAGTATTACCAGATATGACTCCAAGCACAGAGATGTCAATGAGAGGAATAAGAGTCAGCAAAATGGGTGTGGATGAATACTCCAGTACAGAGAGGGTGGTGGTTAGCATTGATCGGTTTTTGAGAGTTCGAGACCAACGCGGGAATGTATTATTATCTCCTGAGGAGGTCAGTGAAACACAGGGAACAGAGAGACTGACAATAACTTATTCATCGTCAATGATGTGGGAGATTAACGGTCCTGAGTCGGTTTTGGTCAATACCTATCAATGGATCATCAGAAATTGGGAAGCTGTCAAAATTCAATGGTCTCAGAATCCTGCAATGTTGTACAACAAAATGGAATTTGAACCATTTCAATCTTTAGTCCCTAAGGCCATTAGAGGCCAATACAGTGGGTTTGTCAGAACTCTATTCCAACAAATGAGAGATGTACTTGGGACATTTGACACCACCCAGATAATAAAGCTTCTCCCTTTTGCAGCCGCTCCACCAAAGCAAAGCAGAATGCAGTTCTCTTCATTGACTGTAAATGTGAGGGGATCAGGGATGAGAATACTTGTAAGGGGCAATTCTCCTGTATTCAACTACAACAAGACCACTAAAAGACTAACAATTCTCGGAAAAGATGCCGGCACTTTAATTGAAGACCCAGATGAAAGCACATCCGGAGTGGAGTCCGCTGTCTTGAGAGGATTTCTCATTATAGGTAAGGAAGACAGAAGATACGGACCGGCATTAAGCATCAATGAACTGAGTAACCTTGCAAAAGGGGAAAAAGCTAATGTGCTAATCGGGCAAGGAGACGTGGTGTTGGTAATGAAACGAAAACGGGACTCTAGCATACTTACTGACAGCCAGACAGCGACCAAAAGAATTCGGATGGCCATCAAT**TAA**TGTTGAATAGTTTAAAAACGACCTTGTTTCTACT

PB1 (2341 bp)

## Nature: cRNA 5’ 🡪 3’

## Source: DQ487328.1 Influenza A virus (A/Moscow/10/99(H3N2)) segment 2

AGCGAAAGCAGGCAAACCATTTGAATGGATGTCAATCCGACTCTACTTTTCCTAAAGGTTCCAGCGCAAA

ATGCCATAAGCACCACATTCCCTTATACTGGAGATCCTCCATACAGCCATGGAACAGGAACAGGGTACAC

CATGGACACAGTCAACAGAACACACCAATATTCAGAAAAGGGGAAGTGGACGACAAATACAGAAACTGGG

GCACCCCAACTCAACCCAATTGATGGACCACTACCTGAGGATAATGAGCCAAGTGGATATGCACAAACAG

ACTGTGTCCTGGAGGCTATGGCCTTCCTTGAAGAATCCCACCCAGGGATCTTTGAGAACTCATGCCTTGA

AACAATGGAAGTCGTTCAACAAACAAGGGTGGACAAACTAACTCAAGGTCGCCAGACTTATGATTGGACA

TTAAACAGAAATCAACCGGCAGCAACTGCATTAGCCAACACCATAGAAGTTTTTAGATCGAATGGTCTAA

CAGCTAATGAATCAGGAAGGCTAATAGATTTCCTCAAGGATGTGATGGAATCAATGGATAAAGAGGAAAT

GGAGATAACAACACACTTTCAAAGAAAAAGGAGAGTAAGAGACAACATGACCAAGAAAATGGTCACACAA

AGAACAATAGGGAAGAAAAAACAAAGAGTGAATAAGAGAGGCTATCTAATAAGAGCTTTGACATTGAACA

CGATGACCAAAGATGCAGAGAGAGGTAAATTAAAAAGAAGGGCTATTGCAACACCCGGGATGCAAATTAG

AGGGTTCGTGTACTTCGTTGAAACTTTAGCTAGAAGCATTTGCGAAAAGCTTGAACAGTCTGGACTTCCG

GTTGGGGGTAATGAAAAGAAGGCCAAACTGGCAAATGTTGTGAGAAAAATGATGACTAATTCACAAGACA

CAGAGCTTTCTTTCACAATCACTGGGGACAACACTAAGTGGAATGAAAATCAAAACCCTCGAATGTTTTT

GGCGATGATTACATATATCACAAAAAATCAACCTGAGTGGTTCAGAAACATCCTGAGCATAGCACCAATA

ATGTTCTCAAACAAAATGGCAAGACTAGGAAAAGGATACATGTTCGAGAGTAAGAGAATGAAGCTCCGAA

CACAAATACCCGCAGAAATGCTAGCAAGCATCGACCTGAAGTATTTCAATGAATCAACAAGGAAGAAAAT

TGAGAAAATAAGGCCTCTTCTAATAGATGGCACAGCATCATTGAGCCCTGGGATGATGATGGGCATGTTC

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ACTGGTGGGATGGGCTCCAATCCTCCGACGATTTTGCCCTCATAGTGAATGCACCAAATCATGAGGGAAT

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TATATAAATAAAACAGGGACATTTGAATTCACAAGCTTTTTTTATCGCTATGGATTTGTGGCTAATTTTA

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GATAAAGAACAACATGATAAACAATGACCTTGGACCAGCAACAGCCCAGATGGCTCTTCAATTGTTCATC

AAAGACTACAGATATACATATAGGTGCCATAGAGGAGACACACAAATTCAGACGAGAAGATCATTCGAGC

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CAATATCCGGAATCTTCACATTCCTGAAGTCTGCTTAAAGTGGGAGCTAATGGATGAGGATTATCGGGGA

AGACTTTGTAATCCCCTGAATCCCTTTGTCAGCCATAAAGAAATTGAGTCTGTAAACAATGCTGTAGTGA

TGCCAGCCCATGGTCCAGCCAAAAGTATGGAATATGATGCCGTTGCAACTACACACTCCTGGATTCCCAA

GAGGAACCGCTCTATTCTAAACACAAGCCAAAGGGGAATTCTTGAGGATGAACAGATGTACCAGAAGTGC

TGCAACTTGTTCGAGAAATTTTTCCCTAGTAGTTCATATAGGAGACCGGTTGGAATTTCTAGCATGGTGG

AGGCCATGGTGTCTAGAGCCCGGATTGATGCCAGAATTGACTTCGAGTCTGGACGGATTAAGAAGGAAGA

GTTCTCTGAGATCATGAAGATCTGTTCCACCATTGAAGAACTCAGACGGCAAAAATAATGAATTTAGCTT

GTCCTTCATGAAAAAATGCCTTGTTTCTACT

PB1 protein

## Source: ABE73096.1 (757 aa) polymerase PB2

## Sequence: 25 - 2298

MDVNPTLLFLKVPAQNAISTTFPYTGDPPYSHGTGTGYTMDTVNRTHQYSEKGKWTTNTETGAPQLNPID

GPLPEDNEPSGYAQTDCVLEAMAFLEESHPGIFENSCLETMEVVQQTRVDKLTQGRQTYDWTLNRNQPAA

TALANTIEVFRSNGLTANESGRLIDFLKDVMESMDKEEMEITTHFQRKRRVRDNMTKKMVTQRTIGKKKQ

RVNKRGYLIRALTLNTMTKDAERGKLKRRAIATPGMQIRGFVYFVETLARSICEKLEQSGLPVGGNEKKA

KLANVVRKMMTNSQDTELSFTITGDNTKWNENQNPRMFLAMITYITKNQPEWFRNILSIAPIMFSNKMAR

LGKGYMFESKRMKLRTQIPAEMLASIDLKYFNESTRKKIEKIRPLLIDGTASLSPGMMMGMFNMLSTVLG

VSILNLGQKKYTKTTYWWDGLQSSDDFALIVNAPNHEGIQAGVDRFYRTCKLVGINMSKKKSYINKTGTF

EFTSFFYRYGFVANFSMELPSFGVSGINESADMSIGVTVIKNNMINNDLGPATAQMALQLFIKDYRYTYR

CHRGDTQIQTRRSFELKKLWDQTQSRAGLLVSDGGPNLYNIRNLHIPEVCLKWELMDEDYRGRLCNPLNP

FVSHKEIESVNNAVVMPAHGPAKSMEYDAVATTHSWIPKRNRSILNTSQRGILEDEQMYQKCCNLFEKFF

PSSSYRRPVGISSMVEAMVSRARIDARIDFESGRIKKEEFSEIMKICSTIEELRRQK

PB1-F2 protein

## Source:  ABE73097.1 (90 aa) polymerase PB2

## Sequence: 119 - 391

MEQEQGTPWTQSTEHTNIQKRGSGRQIQKLGHPNSTQLMDHYLRIMSQVDMHKQTVSWRLWPSLKNPTQG

SLRTHALKQWKSFNKQGWTN

PB1 (2314 bp)

## Nature: vRNA

## Source: Illumina sequences from virus stocks\_RPS2022

NNNNNNAGCAGGCAAACCATTTGAATGGATGTCAATCCGACTCTACTTTTCCTAAAGGTTCCAGCGCAAAATGCCATAAGCACCACATTCCCTTATACTGGAGATCCTCCATACAGCCATGGAACAGGAACAGGGTACACCATGGACACAGTCAACAGAACACACCAATATTCAGAAAAGGGGAAGTGGACGACAAATACAGAAACTGGGGCACCCCAACTCAACCCAATTGATGGACCACTACCTGAGGATAATGAGCCAAGTGGATATGCACAAACAGACTGTGTCCTGGAGGCTATGGCCTTCCTTGAAGAATCCCACCCAGGGATCTTTGAGAACTCATGCCTTGAAACAATGGAAGTCGTTCAACAAACAAGGGTGGACAAACTAACTCAAGGTCGCCAGACTTATGATTGGACATTAAACAGAAATCAACCGGCAGCAACTGCATTAGCCAACACCATAGAAGTTTTTAGATCGAATGGTCTAACAGCTAATGAATCAGGAAGGCTAATAGATTTCCTCAAGGATGTGATGGAATCAATGGATAAAGAGGAAATGGAGATAACAACACACTTTCAAAGAAAAAGGAGAGTAAGAGACAACATGACCAAGAAAATGGTCACACAAAGAACAATAGGGAAGAAAAAACAAAGAGTGAATAAGAGAGGCTATCTAATAAGAGCTTTGACATTGAACACGATGACCAAAGATGCAGAGAGAGGTAAATTAAAAAGAAGGGCTATTGCAACACCCGGGATGCAAATTAGAGGGTTCGTGTACTTCGTTGAAACTTTAGCTAGAAGCATTTGCGAAAAGCTTGAACAGTCTGGACTTCCGGTTGGGGGTAATGAAAAGAAGGCCAAACTGGCAAATGTTGTGAGAAAAATGATGACTAATTCACAAGACACAGAGCTTTCTTTCACAATCACTGGGGACAACACTAAGTGGAATGAAAATCAAAACCCTCGAATGTTTTTGGCGATGATTACATATATCACAAAAAATCAACCTGAGTGGTTCAGAAACATCCTGAGCATCGCACCAATAATGTTCTCAAACAAAATGGCAAGACTAGGAAAAGGATACATGTTCGAGAGTAAGAGAATGAAGCTCCGAACACAAATACCCGCAGAAATGCTAGCAAGCATCGACCTGAAGTATTTCAATGAATCAACAAGGAAGAAAATTGAGAAAATAAGGCCTCTTCTAATAGATGGCACAGCATCATTGAGCCCTGGGATGATGATGGGCATGTTCAACATGCTAAGTACGGTTTTAGGAGTCTCGATACTGAATCTTGGGCAAAAGAAATACACCAAGACAACATACTGGTGGGATGGGCTCCAATCCTCCGACGATTTTGCCCTCATAGTGAATGCACCAAATCATGAGGGAATACAAGCAGGAGTGGATAGATTCTACAGGACCTGCAAGTTGGTGGGAATCAACATGAGCAAAAAGAAGTCCTATATAAATAAAACAGGGACATTTGAATTCACAAGCTTTTTTTATCGCTATGGATTTGTGGCTAATTTTAGCATGGAGCTGCCCAGTTTTGGAGTGTCTGGAATAAATGAGTCAGCTGATATGAGCATTGGAGTAACAGTGATAAAGAACAACATGATAAACAATGACCTTGGACCAGCAACAGCCCAGATGGCTCTTCAATTGTTCATCAAAGACTACAGATATACATATAGGTGCCATAGAGGAGACACACAAATTCAGACGAGAAGATCATTCGAGCTAAAGAAGCTGTGGGATCAAACCCAATCAAGGGCAGGACTATTGGTATCAGATGGGGGACCAAACTTATACAATATCCGGAATCTTCACATTCCTGAAGTCTGCTTAAAGTGGGAGCTAATGAATGAGGATTATCGGGGAAGACTTTGTAATCCCCTGAATCCCTTTGTCAGCCATAAAGAGATTGAGTCTGTAAACAATGCTGTAGTGATGCCAGCCCATGGTCCAGCCAAAAGTATGGAATATGATGCCGTTGCAACTACACACTCCTGGATTCCCAAGAGGAACCGCTCTATTCTCAACACAAGCCAAAGGGGAATTCTTGAGGATGAACAGATGTACCAGAAGTGCTGCAACTTGTTCGAGAAATTTTTCCCTAGCAGTTCATATAGGAGACCGGTTGGAATTTCTAGCATGGTGGAGGCCATGGTGTCTAGGGCCCGGATTGATGCCAGAATTGACTTCGAGTCTGGACGGATTAAGAAGGAAGAGTTCTCTGAGATCATGAAGATCTGTTCCACCATTGAAGAACTCAGACGGCAAAAATAATGAATTTAGCTTGTCCTTCATGAAAAAATGCCNNNNNNNNNNN

PB1 (2341 bp)

## Nature: cDNA\_pHW2000

## Source: GATC sequences from Maxiprep\_RPS\_2023

AGCGAAAGCAGGCAAACCATTTGA**ATG**GATGTCAATCCGACTCTACTTTTCCTAAAGGTTCCAGCGCAAAATGCCATAAGCACCACATTCCCTTATACTGGAGATCCTCCATACAGCCATGGAACAGGAACAGGGTACACCATGGACACAGTCAACAGAACACACCAATATTCAGAAAAGGGGAAGTGGACGACAAATACAGAAACTGGGGCACCCCAACTCAACCCAATTGATGGACCACTACCTGAGGATAATGAGCCAAGTGGATATGCACAAACAGACTGTGTCCTGGAGGCTATGGCCTTCCTTGAAGAATCCCACCCAGGGATCTTTGAGAACTCATGCCTTGAAACAATGGAAGTCGTTCAACAAACAAGGGTGGACAAACTAACTCAAGGTCGCCAGACTTATGATTGGACATTAAACAGAAATCAACCGGCAGCAACTGCATTAGCCAACACCATAGAAGTTTTTAGATCGAATGGTCTAACAGCTAATGAATCAGGAAGGCTAATAGATTTCCTCAAGGATGTGATGGAATCAATGGATAAAGAGGAAATGGAGATAACAACACACTTTCAAAGAGAAAGGAGAGTAAGAGACAACATGACCAAGAAAATGGTCACACAAAGAACAATAGGGAAGAAAAAACAAAGAGTGAATAAGAGAGGCTATCTAATAAGAGCTTTGACATTGAACACGATGACCAAAGATGCAGAGAGAGGTAAATTAAAAAGAAGGGCTATTGCAACACCCGGGATGCAAATTAGAGGGTTCGTGTACTTCGTTGAAACTTTAGCTAGAAGCATTTGCGAAAAGCTTGAACAGTCTGGACTTCCGGTTGGGGGTAATGAAAAGAAGGCCAAACTGGCAAATGTTGTGAGAAAAATGATGACTAATTCACAAGACACAGAGCTTTCTTTCACAATCACTGGGGACAACACTAAGTGGAATGAAAATCAAAACCCTCGAATGTTTTTGGCGATGATTACATATATCACAAAAAATCAACCTGAGTGGTTCAGAAACATCCTGAGCATCGCACCAATAATGTTCTCAAACAAAATGGCAAGACTAGGAAAAGGATACATGTTCGAGAGTAAGAGAATGAAGCTCCGAACACAAATACCCGCAGAAATGCTAGCAAGCATCGACCTGAAGTATTTCAATGAATCAACAAGGAAGAAAATTGAGAAAATAAGGCCTCTTCTAATAGATGGCACAGCATCATTGAGCCCTGGGATGATGATGGGCATGTTCAACATGCTAAGTACGGTTTTAGGAGTCTCGATACTGAATCTTGGGCAAAAGAAATACACCAAGACAACATACTGGTGGGATGGGCTCCAATCCTCCGACGATTTTGCCCTCATAGTGAATGCACCAAATCATGAGGGAATACAAGCAGGAGTGGATAGATTCTACAGGACCTGCAAGTTGGTGGGAATCAACATGAGCAAAAAGAAGTCCTATATAAATAAAACAGGGACATTTGAATTCACAAGCTTTTTTTATCGCTATGGATTTGTGGCTAATTTTAGCATGGAGCTGCCCAGTTTTGGAGTGTCTGGAATAAATGAGTCAGCTGATATGAGCATTGGAGTAACAGTGATAAAGAACAACATGATAAACAATGACCTTGGACCAGCAACAGCCCAGATGGCTCTTCAATTGTTCATCAAAGACTACAGATATACATATAGGTGCCATAGAGGAGACACACAAATTCAGACGAGAAGATCATTCGAGCTAAAGAAGCTGTGGGATCAAACCCAATCAAAGGCAGGACTATTGGTATCAGATGGGGGACCAAACTTATACAATATCCGGAATCTTCACATTCCTGAAGTCTGCTTAAAATGGGAGCTAATGAATGAGGATTATCGGGGAAGACTTTGTAATCCCCTGAATCCCTTTGTCAGCCATAAAGAGATTGAGTCTGTAAACAATGCTGTAGTGATGCCAGCCCATGGTCCAGCCAAAAGTATGGAATATGATGCCGTTGCAACTACACACTCCTGGATTCCCAAGAGGAACCGCTCTATTCTCAACACAAGCCAAAGGGGAATTCTTGAGGATGAACAGATGTACCAGAAGTGCTGCAACTTGTTCGAGAAATTTTTCCCTAGCAGTTCATATAGGAGACCGGTTGGAATTTCTAGCATGGTGGAGGCCATGGTGTCTAGGGCCCGGATTGATGCCAGAATTGACTTCGAGTCTGGACGGATTAAGAAGGAAGAGTTCTCTGAGATCATGAAGATCTGTTCCACCATTGAAGAACTCAGACGGCAAAAA**TAA**TGAATTTAGCTTGTCCTTCATGAAAAAATGCCTTGTTTCTACT

PA (2233 bp)

## Nature: cRNA

## Source: DQ487327.1 Influenza A virus (A/Moscow/10/99(H3N2)) segment 3

AGCGAAAGCAGGTACTGATTCGAAATGGAAGATTTTGTGCGACAATGCTTCAACCCGATGATTGTCGAAC

TTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAATTGAAACAAACAAATTTGCAGCAATATG

CACTCACTTGGAGGTATGTTTCATGTATTCAGATTTTCATTTCATCAATGAACAAGGCGAATCAATAGTG

GTAGAACTTGATGATCCAAATGCACTGTTAAAGCACAGATTTGAAATAATCGAGGGGAGAGACAGAACAA

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GAAAAGGCCAATAAAATTAAATCTGAGAATACACACATTCACATTTTCTCATTCACTGGGGAGGAAATGG

CCACAAAGGCAGACTACACTCTCGACGAGGAAAGCAGGGCTAGGATTAAGACCAGGCTATTTACCATAAG

ACAAGAAATGGCCAACAGAGGCCTCTGGGATTCCTTTCGTCAGTCCGAAAGAGGCGAAGAAACAATTGAA

GAAAAATTTGAAATCTCAGGAACTATGCGCAGGCTTGCCGACCAAAGTCTCCCGCCGAACTTCTCCTGCC

TTGAGAATTTTAGAGCCTATGTGGATGGATTCGAACCGAACGGCTGCATTGAGGGCAAGCTTTCTCAAAT

GTCCAAAGAAGTGAATGCCAAAATTGAACCTTTTCTGAAGACAACACCAAGACCAATCAAACTTCCGAAT

GGACCTCCTTGTTATCAGCGGTCCAAATTCCTCCTGATGGATGCTTTAAAATTGAGCATTGAAGACCCAA

GTCACGAAGGAGAAGGGATCCCACTATATGATGCGATCAAGTGCATAAAAACATTCTTTGGATGGAAAGA

ACCTTATATAGTCAAACCACACGAAAAGGGAATAAATTCAAATTACCTGCTGTCATGGAAGCAAGTATTG

TCAGAATTGCAGGACATTGAAAATGAGGAGAAGATTCCAAGGACTAAAAACATGAAGAAAACGAGTCAAC

TAAAGTGGGCTCTTGGTGAAAACATGGCACCAGAGAAAGTAGACTTTGACAACTGCAGAGACATAAGCGA

TTTGAAGCAATATGATAGTGACGAACCTGAATTAAGGTCACTTTCAAGCTGGATACAGAATGAGTTCAAC

AAGGCCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGATGAAATTGGAGAGGACGTAGCCCCAATTG

AGTACATTGCAAGCATGAGGAGGAATTATTTCACAGCAGAGGTGTCCCATTGTAGAGCCACTGAATACAT

AATGAAGGGGGTATACATTAATACTGCCTTGCTCAATGCATCCTGTGCAGCAATGGACGATTTTCAACTA

ATTCCCATGATAAGCAAGTGCAGAACTAAAGAGGGAAGGCGAAAAACCAATTTATATGGATTCATCATAA

AAGGAAGATCTCATTTAAGGAATGACACAGATGTGGTAAACTTTGTGAGCATGGAGTTTTCTCTCACTGA

CCCGAGACTTGAGCCACATAAATGGGAGAAATACTGTGTCCTTGAGATAGGAGATATGTTACTAAGAAGT

GCCATAGGCCAAATTTCAAGGCCTATGTTCTTGTATGTGAGGACAAACGGAACATCAAAGGTCAAAATGA

AATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGATCGAGAGCATGATTGAAGCCGA

GTCCTCGGTTAAAGAGAAAGACATGACCAAAGAGTTTTTTGAGAATAAATCAGAAGCATGGCCCATTGGG

GAGTCCCCCAAGGGAGTGGAAGAAGGTTCCATTGGGAAAGTCTGTAGGACTCTGTTGGCTAAGTCGGTGT

TCAATAGCCTGTATGCATCACCACAATTAGAAGGATTTTCAGCGGAGTCAAGAAAACTGCTCCTTGTTGT

TCAGGCTCTTAGGGACAACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAG

TGCCTGATTAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTCAACTCCTTCCTGACACATGCATTAA

AATAGTTATGGCAGTGCTACTATTTGTTATCCGTACTGTCCAAAAAAGTACCTTGTTTCTACT

PA protein

## Source: ABE73095.1 (716 aa) polymerase PB2

## Sequence: 251- 715

MEDFVRQCFNPMIVELAEKAMKEYGEDLKIETNKFAAICTHLEVCFMYSDFHFINEQGESIVVELDDPNA

LLKHRFEIIEGRDRTMAWTVVNSICNTTGAEKPKFLPDLYDYKENRFIEIGVTRREVHIYYLEKANKIKS

ENTHIHIFSFTGEEMATKADYTLDEESRARIKTRLFTIRQEMANRGLWDSFRQSERGEETIEEKFEISGT

MRRLADQSLPPNFSCLENFRAYVDGFEPNGCIEGKLSQMSKEVNAKIEPFLKTTPRPIKLPNGPPCYQRS

KFLLMDALKLSIEDPSHEGEGIPLYDAIKCIKTFFGWKEPYIVKPHEKGINSNYLLSWKQVLSELQDIEN

EEKIPRTKNMKKTSQLKWALGENMAPEKVDFDNCRDISDLKQYDSDEPELRSLSSWIQNEFNKACELTDS

IWIELDEIGEDVAPIEYIASMRRNYFTAEVSHCRATEYIMKGVYINTALLNASCAAMDDFQLIPMISKCR

TKEGRRKTNLYGFIIKGRSHLRNDTDVVNFVSMEFSLTDPRLEPHKWEKYCVLEIGDMLLRSAIGQISRP

MFLYVRTNGTSKVKMKWGMEMRRCLLQSLQQIESMIEAESSVKEKDMTKEFFENKSEAWPIGESPKGVEE

GSIGKVCRTLLAKSVFNSLYASPQLEGFSAESRKLLLVVQALRDNLEPGTFDLGGLYEAIEECLINDPWV

LLNASWFNSFLTHALK

PA (2233 bp)

## Nature: vRNA

## Source: Illumina sequences from virus stocks\_RPS2022

NNNNNNAGCAGGTACTGATTCGAAATGGAAGATTTTGTGCGACAATGCTTCAACCCGATGATTGTCGAACTTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAATTGAAACAAACAAATTTGCAGCAATATGCACTCACTTGGAGGTATGTTTCATGTATTCAGATTTTCATTTCATCAATGAACAAGGCGAATCAATAGTGGTAGAACTTGATGATCCAAATGCACTGTTAAAGCACAGATTTGAAATAATCGAGGGGAGAGACAGAACAATGGCCTGGACAGTAGTAAACAGTATCTGCAACACTACTGGAGCTGAAAAACCGAAGTTTCTACCAGATTTGTATGATTACAAGGAGAACAGATTCATCGAAATTGGAGTGACAAGGAGAGAAGTCCACATATATTACCTTGAAAAGGCCAATAAAATTAAATCTGAGAATACACACATTCACATTTTCTCATTCACTGGGGAGGAAATGGCCACAAAGGCAGACTACACTCTCGACGAGGAAAGCAGGGCTAGGATTAAGACCAGGCTATTTACCATAAGACAAGAAATGGCCAACAGAGGCCTCTGGGATTCCTTTCGTCAGTCCGAAAGAGGCGAAGAAACAATTGAAGAAAAATTTGAAATCTCAGGAACTATGCGCAGGCTTGCCGACCAAAGTCTCCCGCCGAACTTCTCCTGCCTTGAGAATTTTAGAGCCTATGTGGATGGATTCGAACCGAACGGCTGCATTGAGGGCAAGCTTTCTCAAATGTCCAAAGAAGTGAATGCCAAAATTGAACCTTTTCTGAAGACAACACCAAGACCAATCAAACTTCCGAATGGACCTCCTTGTTATCAGCGGTCCAAATTCCTCCTGATGGATGCTTTAAAATTGAGCATTGAAGACCCAAGTCACGAAGGAGAAGGGATCCCACTATATGATGCGATCAAGTGCATAAAAACATTCTTTGGATGGAAAGAACCTTATATAGTCAAACCACACGAAAAGGGAATAAATTCAAATTACCTGCTGTCATGGAAGCAAGTATTGTCAGAATTGCAGGACATTGAAAATGAGGAGAAGATTCCAAGGACTAAAAACATGAAGAAAACGAGTCAACTAAAGTGGGCTCTTGGTGAAAACATGGCACCAGAGAAAGTAGACTTTGACAACTGCAGAGACATAAGCGATTTGAAGCAATATGATAGTGACGAACCTGAATTAAGGTCACTTTCAAGCTGGATACAGAATGAGTTCAACAAGGCCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGATGAAATTGGAGAGGACGTAGCCCCAATTGAGTACATTGCAAGCATGAGGAGGAATTATTTCACAGCAGAGGTGTCCCATTGTAGAGCCACTGAGTACATAATGAAGGGGGTATACATTAATACTGCCTTGCTCAATGCATCCTGTGCAGCAATGGACGATTTTCAACTAATTCCCATGATAAGCAAGTGCAGAACTAAAGAGGGAAGGCGAAAAACCAATTTATATGGATTCATCATAAAAGGAAGATCTCATTTAAGGAATGACACAGATGTGGTAAACTTTGTGAGCATGGAGTTTTCTCTCACTGACCCGAGACTTGAGCCACATAAATGGGAGAAATACTGTGTCCTTGAGATAGGAGATATGTTACTAAGAAGTGCCATAGGCCAAATTTCAAGGCCTATGTTCTTGTATGTGAGGACAAACGGAACATCAAAGGTCAAAATGAAATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGATCGAGAGCATGATTGAAGCCGAGTCCTCGGTTAAAGAGAAAGACATGACCAAAGAGTTTTTTGAGAATAAATCAGAAGCATGGCCCATTGGGGAGTCCCCCAAGGGAGTGGAAGAAGGTTCCATTGGGAAAGTCTGTAGGACTCTGTTGGCTAAGTCGGTGTTCAATAGCCTGTATGCATCACCACAATTAGAAGGATTTTCAGCGGAGTCAAGAAAACTGCTCCTTGTTGTTCAGGCTCTTAGGGACAACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAGTGCCTGATTAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTCAACTCCTTCCTGACACATGCATTAAAATAGTTATGGCAGTGCTACTATTTGTTATCCGTACTGTCCAAAAAAGTACCTTGNNNNNNNN

PA (2233 bp)

## Nature: cDNA\_pHW2000

## Source: GATC sequences from Maxiprep\_RPS\_2023

AGCAAAAGCAGGTACTGATTCGAA**ATG**GAAGATTTTGTGCGACAATGCTTCAACCCGATGATTGTCGAACTTGCAGAAAAAGCAATGAAAGAGTATGGAGAGGATCTGAAAATTGAAACAAACAAATTTGCAGCAATATGCACTCACTTGGAGGTATGTTTCATGTATTCAGATTTTCATTTCATCAATGAACAAGGCGAATCAATAGTGGTAGAACTTGATGATCCAAATGCACTGTTAAAGCACAGATTTGAAATAATCGAGGGGAGAGACAGAACAATGGCCTGGACAGTAGTAAACAGTATCTGCAACACTACTGGAGCTGAAAAACCGAAGTTTCTACCAGATTTGTATGATTACAAGGAGAACAGATTCATCGAAATTGGAGTGACAAGGAGAGAAGTCCACATATATTACCTTGAAAAGGCCAATAAAATTAAATCTGAGAATACACACATTCACATTTTCTCATTCACTGGGGAGGAAATGGCCACAAAGGCAGACTACACTCTCGACGAGGAAAGCAGGGCTAGGATTAAGACCAGGCTATTTACCATAAGACAAGAAATGGCCAACAGAGGCCTCTGGGATTCCTTTCGTCAGTCCGAAAGAGGCGAAGAAACAATTGAAGAAAAATTTGAAATCTCAGGAACTATGCGCAGGCTTGCCGACCAAAGTCTCCCGCCGAACTTCTCCTGCCTTGAGAATTTTAGAGCCTATGTGGATGGATTCGAACCGAACGGCTGCATTGAGGGCAAGCTTTCTCAAATGTCCAAAGAAGTGAATGCCAAAATTGAACCTTTTCTGAAGACAACACCAAGACCAATCAAACTTCCGAATGGACCTCCTTGTTATCAGCGGTCCAAATTCCTCCTGATGGATGCTTTAAAATTGAGCATTGAAGACCCAAGTCACGAAGGAGAAGGGATCCCACTATATGATGCGATCAAGTGCATAAAAACATTCTTTGGATGGAAAGAACCTTATATAGTCAAACCACACGAAAAGGGAATAAATTCAAATTACCTGCTGTCATGGAAGCAAGTATTGTCAGAATTGCAGGACATTGAAAATGAGGAGAAGATTCCAAGGACTAAAAACATGAAGAAAACGAGTCAACTAAAGTGGGCTCTTGGTGAAAACATGGCACCAGAGAAAGTAGACTTTGACAACTGCAGAGACATAAGCGATTTGAAGCAATATGATAGTGACGAACCTGAATTAAGGTCACTTTCAAGCTGGATACAGAATGAGTTCAACAAGGCCTGCGAGCTAACTGATTCAATCTGGATAGAGCTCGATGAAATTGGAGAGGACGTAGCCCCAATTGAGTACATTGCAAGCATGAGGAGGAATTATTTCACAGCAGAGGTGTCCCATTGTAGAGCCACTGAGTACATAATGAAGGGGGTATACATTAATACTGCCTTGCTCAATGCATCCTGTGCAGCAATGGACGATTTTCAACTAATTCCCATGATAAGCAAGTGCAGAACTAAAGAGGGAAGGCGAAAAACCAATTTATATGGATTCATCATAAAAGGAAGATCTCATTTAAGGAATGACACAGATGTGGTAAACTTTGTGAGCATGGAGTTTTCTCTCACTGACCCGAGACTTGAGCCACATAAATGGGAGAAATACTGTGTCCTTGAGATAGGAGATATGTTACTAAGAAGTGCCATAGGCCAAATTTCAAGGCCTATGTTCTTGTATGTGAGGACAAACGGAACATCAAAGGTCAAAATGAAATGGGGAATGGAGATGAGACGTTGCCTCCTTCAGTCACTCCAGCAGATCGAGAGCATGATTGAAGCCGAGTCCTCGGTTAAAGAGAAAGACATGACCAAAGAGTTTTTTGAGAATAAATCAGAAGCATGGCCCATTGGGGAGTCCCCCAAGGGAGTGGAAGAAGGTTCCATTGGGAAAGTCTGTAGGACTCTGTTGGCTAAGTCGGTGTTCAATAGCCTGTATGCATCACCACAATTAGAAGGATTTTCAGCGGAGTCAAGAAAACTGCTCCTTGTTGTTCAGGCTCTTAGGGACAACCTCGAACCTGGGACCTTTGATCTTGGGGGGCTATATGAAGCAATTGAGGAGTGCCTGATTAATGATCCCTGGGTTTTGCTCAATGCGTCTTGGTTCAACTCCTTCCTGACACATGCATTAAAA**TAG**TTATGGCAGTGCTACTATTTGTTATCCGTACTGTCCAAAAAAGTACCTTGTTTCTACT

HA (1762 bp)

## Nature: cRNA

## Source: DQ487341.1 Influenza A virus (A/Moscow/10/99(H3N2)) segment 4

AGCAAAAGCAGGGGAGAATTCTATTAACCATGAAGACTATCATTGCTTTGAGCTACATTTTATGTCTGGT

TTTCGCTCAAAAACTTCCCGGAAATGACAACAGCACGGCAACGCTGTGCCTGGGACACCATGCAGTGCCA

AACGGAACGCTAGTGAAAACAATCACGAATGACCAAATTGAAGTGACTAATGCTACTGAGCTGGTTCAGA

GTTCCTCAACAGGTAGAATATGCGACAGTCCTCACCAAATCCTTGATGGAGAAAACTGCACACTGATAGA

TGCTCTATTGGGAGACCCACATTGTGATGGCTTCCAAAATAAGGAATGGGACCTTTTTGTTGAACGCAGC

AAAGCCTACAGCAACTGTTACCCTTATGATGTGCCGGATTATGCCTCCCTTAGGTCACTAGTTGCCTCAT

CCGGCACCCTGGAGTTTAACAATGAAAGCTTCAATTGGACTGGAGTCGCTCAGAATGGAACAAGCTCTGC

TTGCAAAAGGAGATCTATTAAAAGTTTCTTTAGTAGATTGAATTGGTTGCACCAATTAGAAAACAGATAT

CCAGCACTGAACGTGACTATGCCAAACAATGACAAATTTGACAAATTGTACATTTGGGGGGTTCACCACC

CGAGTACGGACAGTGTCCAAACCAGCGTATATGTCCAAGCATCAGGGAGAGTCACAGTCTCTACCAAAAG

AAGCCAACAAACTGTAATCCCGAATATCGGATCCAGACCCTGGGTAAGGGGTGTCTCCAGCAGAATAAGC

ATCTATTGGACAATAGTAAAACCGGGAGACATACTTTTGATTAACAGCACAGGGAATCTAATTGCTCCTC

GGGGTTACTTCAAAATACGAAGTGGGAAAAGCTCAATAATGAGGTCAGATGCACCCATTGGCAAATGCAA

TTCTGAATGCATCACTCCAAATGGAAGCATTCCCAATGACAAACCATTTCAAAATGTAAACAGGATCACA

TATGGGGCCTGTCCCAGATATGTTAAGCAAAACACTCTGAAATTGGCAACAGGGATGCGGAATGTACCAG

AGAAACAAACTAGAGGCATATTCGGCGCAATCGCGGGTTTCATAGAAAATGGTTGGGAGGGAATGATGGA

CGGTTGGTACGGTTTCAGGCATCAAAATTCTGAGGGCACAGGACAAGCAGCAGATCTTAAAAGCACTCAA

GCAGCAATCAACCAAATCAACGGGAAACTGAATAGGTTAATCGAGAAAACGAACGAGAAATTCCATCAAA

TTGAAAAAGAATTCTCAGAAGTAGAAGGGAGAATTCAGGACCTCGAGAAATATGTTGAGGACACTAAAAT

AGATCTCTGGTCGTACAACGCGGAGCTTCTTGTTGCCCTGGAGAACCAACATACAATTGATCTAACTGAC

TCAGAAATGAACAAACTGTTTGAAAGAACAAGGAAGCAACTGAGAGAAAATGCTGAGGATATGGGCAATG

GTTGTTTCAAAATATACCACAAATGTGACAATGCCTGCATAGGGTCAATCAGAAATGGAACTTATGACCA

TGATGTATACAGAGACGAAGCATTAAACAACCGGTTCCAGATCAAAGGTGTTGAGCTGAAGTCAGGATAC

AAAGATTGGATCCTATGGATTTCCTTTGCCATATCATGTTTTTTGCTTTGTGTTGTTTTGCTGGGGTTCA

TTATGTGGGCCTGCCAAAAAGGCAACATTAGGTGCAACATTTGCATTTGAGTGCATTAATTAAAAACACC

CTTGTTTCTACT

HA protein

## Source: ABE73115.1 (566 aa) polymerase PB2

## Sequence: 29- 521

MKTIIALSYILCLVFAQKLPGNDNSTATLCLGHHAVPNGTLVKTITNDQIEVTNATELVQSSSTGRICDS

PHQILDGENCTLIDALLGDPHCDGFQNKEWDLFVERSKAYSNCYPYDVPDYASLRSLVASSGTLEFNNES

FNWTGVAQNGTSSACKRRSIKSFFSRLNWLHQLENRYPALNVTMPNNDKFDKLYIWGVHHPSTDSVQTSV

YVQASGRVTVSTKRSQQTVIPNIGSRPWVRGVSSRISIYWTIVKPGDILLINSTGNLIAPRGYFKIRSGK

SSIMRSDAPIGKCNSECITPNGSIPNDKPFQNVNRITYGACPRYVKQNTLKLATGMRNVPEKQTRGIFGA

IAGFIENGWEGMMDGWYGFRHQNSEGTGQAADLKSTQAAINQINGKLNRLIEKTNEKFHQIEKEFSEVEG

RIQDLEKYVEDTKIDLWSYNAELLVALENQHTIDLTDSEMNKLFERTRKQLRENAEDMGNGCFKIYHKCD

NACIGSIRNGTYDHDVYRDEALNNRFQIKGVELKSGYKDWILWISFAISCFLLCVVLLGFIMWACQKGNI

RCNICI

HA (1759 bp)

## Nature: vRNA

## Source: Illumina sequences from virus stocks\_RPS2022

NNNNNNNGCAGGGGATAATTCTATTAACCATGAAGACTATCATTGCTTTGAGCTACATTTTATGTCTGGTTTTCGCTCAAAAACTTCCCGGAAATGACAACAGCACGGCAACGCTGTGCCTGGGACACCATGCAGTGCCAAACGGAACGCTAGTGAAAACAATCACGAATGACCAAATTGAAGTGACTAATGCTACTGAGCTGGTTCAGAGTTCCTCAACAGGTAGAATATGCGACAGTCCTCACCAAATCCTTGATGGAGAAAACTGCACACTGATAGATGCTCTATTGGGAGACCCACATTGTGATGGCTTCCAAAATAAGGAATGGGACCTTTTTGTTGAACGCAGCAAAGCCTACAGCAACTGTTACCCTTATGATGTGCCGGATTATGCCTCCCTTAGGTCACTAGTTGCCTCATCCGGCACCCTGGAGTTTAACAATGAAAGCTTCAATTGGACTGGAGTCGCTCAGAATGGAACAAGCTCTGCTTGCAAAAGGAGATCTATTAACAGTTTCTTTAGTAGATTGAATTGGTTGCACCAATTAAAATACAGATATCCAGCACTGAACGTGACTATGCCAAACAATGACAAATTTGACAAATTGTACATTTGGGGGGTTCACCACCCGAGTACGGACAGTGACCAAACCAGCCTATATACCCCATCAGGGAGAGTCACAGTCTCTACCAAAAGAAGCCAACAAACTGTAATCCCGAATATCGGATCCAGACCCTGGGTAAGGGGTATCTCCAGCAGAATAAGCATCTATTGGACAATAGTAAAACCGGGAGACATACTTTTGATTAACAGCACAGGGAATCTAATTGCTCCTCGGGGTTACTTCAAAATACGAAGTGGGAAAAGCTCAATAATGAGGTCAGATGCACCCATTGACAAATGCAATTCTGAATGCATCACTCCAAATGGAAGCATTCCCAATGACAAACCATTTCAAAATGTAAACAGGATCACATATGGGGCCTGTCCCAGATATGTTAAGCAAAACACTCTGAAATTGGCAACAGGGATGCGGAATGTACCAGAGAAACAAACTAGAGGCATATTCGGCGCAATCGCGGGTTTCATAGAAAATGGTTGGGAGGGAATGATGGACGGTTGGTACGGTTTCAGGCATCAAAATTCTGAGGGCACAGGACAAGCAGCAGATCTTAAAAGCACTCAAGCAGCAATCAACCAAATCAACGGGAAACTGAATAGGTTAATCGAGAAAACGAACGAGAAATTCCATCAAATTGAAAAAGAATTCTCAGAAGTAGAAGGGAGAATTCAGGACCTCGAGAAATATGTTGAGGACACTAAAATAGATCTCTGGTCGTACAACGCGGAGCTTCTTGTTGCCCTGGAGAACCAACATACAATTGATCTAACTGACTCAGAAATGAACAAACTGTTTGAAAGAACAAGGAAGCAACTGAGAGAAAATGCTGAGGATATGGGCAATGGTTGTTTCAAAATATACCACAAATGTGACAATGCCTGCATAGGGTCAATCAGAAATGGAACTTATGACCATGATGTATACAGAGACGAAGCATTAAACAACCGGTTCCAGATCAAAGGTGTTGAGCTGAAGTCAGGATACAAAGATTGGATCCTATGGATTTCCTTTGCCATATCATGTTATTTGCTTTGTGTTGTTTTGCTGGGGTTCATTATGTGGGCCTGCCAAAAAGGCAACATTAGGTGCAACATTTGCATTTGAGTGCATTAATTAAAAACACCNNNNNNNNNNNN

HA (1759 bp)

## Nature: cDNA\_pHW2000

## Source: GATC sequences from Maxiprep\_RPS\_2023

AGCAAAAGCAGGGGATAATTCTATTAACC**ATG**AAGACTATCATTGCTTTGAGCTACATTTTATGTCTGGTTTTCGCTCAAAAACTTCCCGGAAATGACAACAGCACGGCAACGCTGTGCCTGGGACACCATGCAGTGCCAAACGGAACGCTAGTGAAAACAATCACGAATGACCAAATTGAAGTGACTAATGCTACTGAGCTGGTTCAGAGTTCCTCAACAGGTAGAATATGCGACAGTCCTCACCAAATCCTTGATGGAGAAAACTGCACACTGATAGATGCTCTATTGGGAGACCCACATTGTGATGGCTTCCAAAATAAGGAATGGGACCTTTTTGTTGAACGCAGCAAAGCCTACAGCAACTGTTACCCTTATGATGTGCCGGATTATGCCTCCCTTAGGTCACTAGTTGCCTCATCCGGCACCCTGGAGTTTAACAATGAAAGCTTCAATTGGACTGGAGTCGCTCAGAATGGAACAAGCTCTGCTTGCAAAAGGAGATCTATTAACAGTTTCTTTAGTAGATTGAATTGGTTGCACCAATTAAAATACAGATATCCAGCACTGAACGTGACTATGCCAAACAATGACAAATTTGACAAATTGTACATTTGGGGGGTTCACCACCCGAGTACGGACAGTGACCAAACCAGCCTATATACCCCATCAGGGAGAGTCACAGTCTCTACCAAAAGAAGCCAACAAACTGTAATCCCGAATATCGGATCCAGACCCTGGGTAAGGGGTATCTCCAGCAGAATAAGCATCTATTGGACAATAGTAAAACCGGGAGACATACTTTTGATTAACAGCACAGGGAATCTAATTGCTCCTCGGGGTTACTTCAAAATACGAAGTGGGAAAAGCTCAATAATGAGGTCAGATGCACCCATTGACAAATGCAATTCTGAATGCATCACTCCAAATGGAAGCATTCCCAATGACAAACCATTTCAAAATGTAAACAGGATCACATATGGGGCCTGTCCCAGATATGTTAAGCAAAACACTCTGAAATTGGCAACAGGGATGCGGAATGTACCAGAGAAACAAACTAGAGGCATATTCGGCGCAATCGCGGGTTTCATAGAAAATGGTTGGGAGGGAATGATGGACGGTTGGTACGGTTTCAGGCATCAAAATTCTGAGGGCACAGGACAAGCAGCAGATCTTAAAAGCACTCAAGCAGCAATCAACCAAATCAACGGGAAACTGAATAGGTTAATCGAGAAAACGAACGAGAAATTCCATCAAATTGAAAAAGAATTCTCAGAAGTAGAAGGGAGAATTCAGGACCTCGAGAAATATGTTGAGGACACTAAAATAGATCTCTGGTCGTACAACGCGGAGCTTCTTGTTGCCCTGGAGAACCAACATACAATTGATCTAACTGACTCAGAAATGAACAAACTGTTTGAAAGAACAAGGAAGCAACTGAGAGAAAATGCTGAGGATATGGGCAATGGTTGTTTCAAAATATACCACAAATGTGACAATGCCTGCATAGGGTCAATCAGAAATGGAACTTATGACCATGATGTATACAGAGACGAAGCATTAAACAACCGGTTCCAGATCAAAGGTGTTGAGCTGAAGTCAGGATACAAAGATTGGATCCTATGGATTTCCTTTGCCATATCATGTTATTTGCTTTGTGTTGTTTTGCTGGGGTTCATTATGTGGGCCTGCCAAAAAGGCAACATTAGGTGCAACATTTGCATT**TGA**GTGCATTAATTAAAAACACCCTTGTTTCTACT

NP (1565 bp)

## Nature: cRNA

## Source: DQ487330.1 Influenza A virus (A/Moscow/10/99(H3N2)) segment 5

AGCAAAAGCAGGGTTAATAATCACTCACTGAGTGACATCAAAATCATGGCGTCCCAAGGCACCAAACGGT

CTTATGAACAGATGGAAACTGATGGGGATCGCCAGAATGCAACTGAGATTAGGGCATCCGTCGGGAAGAT

GATTGATGGAATTGGGAGATTCTACATCCAAATGTGCACTGAACTTAAACTCAATGATTATGAAGGGCGG

TTGATCCAGAACAGCTTGACAATAGAGAAAATGGTGCTCTCTGCTTTTGATGAGAGAAGGAATAAATATC

TGGAAGAACACCCCAGCGCGGGGAAAGATCCTAAGAAAACTGGAGGGCCCATATACAGGAGAGTAGATGG

AAAATGGATGAGGGAACTCGTCCTTTATGACAAAGAAGAAATAAGGCGAATCTGGCGCCAAGCCAACAAT

GGTGAGGATGCGACAGCTGGTCTAACTCACATGATGATCTGGCATTCCAATTTGAATGATGCAACATACC

AGAGGACAAGAGCTCTTGTTCGAACCGGAATGGATCCCAGAATGTGCTCTCTGATGCAGGGCTCGACTCT

CCCTAGAAGGTCCGGAGCTGCAGGTGCTGCAGTCAAAGGAATCGGGACAATGGTGATGGAGCTGATCAGA

ATGGTCAAACGGGGGATCAACGATCGAAATTTCTGGAGAGGTGAGAATGGGCGGAAAACAAGAAGTGCTT

ATGAGAGAATGTGCAACATTCTTAAAGGAAAATTTCAAACAGCTGCACAAAGAGCAATGGTGGATCAAGT

GAGAGAAAGTCGGAACCCAGGAAATGCTGAGATCGAAGATCTCATATTTTTGGCAAGATCTGCATTGATA

TTGAGAGGGTCAGTTGCTCACAAATCTTGCCTACCTGCCTGTGTGTATGGACCTGCAGTATCCAGTGGGT

ACGACTTCGAAAAAGAGGGATATTCCTTGGTGGGAATAGACCCTTTCAAACTACTTCAAAATAGCCAAGT

ATACAGCCTAATCAGACCTAACGAGAATCCAGCACACAAGAGTCAGCTGGTGTGGATGGCATGCCATTCT

GCTGCATTTGAAGATTTAAGATTGTTAAGCTTCATCAGAGGGACCAAAGTATCTCCGCGGGGGAAACTTT

CAACTAGAGGAGTACAAATTGCTTCAAATGAGAACATGGATAATATGGGATCGAGTACTCTTGAACTGAG

AAGCGGGTACTGGGCCATAAGGACCAGGAGTGGAGGAAACACTAATCAACAGAGGGCCTCCGCAGGCCAA

ATCAGTGTGCAACCTACGTTTTCTGTACAAAGAAACCTCCCATTTGAAAAGTCAACCGTCATGGCAGCAT

TCACTGGAAATACGGAGGGAAGAACCTCAGACATGAGGGCAGAAATCATAAGAATGATGGAAGGTGCAAA

ACCAGAAGAAGTGTCGTTCCGGGGGAGGGGAGTTTTCGAGCTCTCAGACGAGAAGGCGACGAACCCGATC

GTGCCCTCTTTTGACATGAGTAATGAAGGATCTTATTTCTTCGGAGACAATGCAGAAGAGTACGACAATT

AAGGAAAAATACCCTTGTTTCTACT

NP protein

## Source: ABE73100.1 (498 aa) polymerase PB2

## Sequence: 1- 498

MASQGTKRSYEQMETDGDRQNATEIRASVGKMIDGIGRFYIQMCTELKLNDYEGRLIQNSLTIEKMVLSA

FDERRNKYLEEHPSAGKDPKKTGGPIYRRVDGKWMRELVLYDKEEIRRIWRQANNGEDATAGLTHMMIWH

SNLNDATYQRTRALVRTGMDPRMCSLMQGSTLPRRSGAAGAAVKGIGTMVMELIRMVKRGINDRNFWRGE

NGRKTRSAYERMCNILKGKFQTAAQRAMVDQVRESRNPGNAEIEDLIFLARSALILRGSVAHKSCLPACV

YGPAVSSGYDFEKEGYSLVGIDPFKLLQNSQVYSLIRPNENPAHKSQLVWMACHSAAFEDLRLLSFIRGT

KVSPRGKLSTRGVQIASNENMDNMGSSTLELRSGYWAIRTRSGGNTNQQRASAGQISVQPTFSVQRNLPF

EKSTVMAAFTGNTEGRTSDMRAEIIRMMEGAKPEEVSFRGRGVFELSDEKATNPIVPSFDMSNEGSYFFG

DNAEEYDN

NP (1566 bp)

## Nature: vRNA

## Source: Illumina sequences from virus stocks\_RPS2022

NNNNNNAGCAGGGTTAATAATCACTCACTGAGTGACATCAAAATCATGGCGTCCCAAGGCACCAAACGGTCTTATGAACAGATGGAAACTGATGGGGATCGCCAGAATGCAACTGAGATTAGGGCATCCGTCGGGAAGATGATTGATGGAATTGGGAGATTCTACATCCAAATGTGCACTGAACTTAAACTCAGTGATTATGAAGGGCGGTTGATCCAGAACAGCTTGACAATAGAGAAAATGGTGCTCTCTGCTTTTGATGAGAGAAGGAATAAATATCTGGAAGAACACCCCAGCGCGGGGAAAGATCCTAAGAAAACTGGAGGGCCCATATACAGGAGAGTAGATGGAAAATGGATGAGGGAACTCGTCCTTTATGACAAAGGAGAAATAAGGCGAATCTGGCGCCAAGCCAACAATGGTGAGGATGCGACAGCTGGTCTAACTCACATGATGATCTGGCATTCCAATTTGAATGATGCAACATACCAGAGGACAAGAGCTCTTGTTCGAACCGGAATGGATCCCAGAATGTGCTCTCTGATGCAGGGCTCGACTCTCCCTAGAAGGTCCGGAGCTGCAGGTGCTGCAGTCAAAGGAATCGGGACAATGGTGATGGAGCTGATCAGAATGGTCAAACGGGGGATCAACGATCGAAATTTCTGGAGAGGTGAGAATGGGCGGAAAACAAGAAGTGCTTATGAGAGAATGTGCAACATTCTTAAAGGAAAATTTCAAACAGCTGCACAAAGAGCAATGGTGGATCAAGTGAGAGAAAGTCGGAACCCAGGAAATGCTGAGATCGAAGATCTCATATTTTTGGCAAGATCTGCATTGATATTGAGAGGGTCAGTTGCTCACAAATCTTGCCTACCTGCCTGTGTGTATGGACCTGCAGTATCCAGTGGGTACGACTTCGAAAAAGAGGGATATTCCTTGGTGGGAATAGACCCTTTCAAACTACTTCAAAATAGCCAAGTATACAGCCTAATCAGACCTAACGAGAATCCAGCACACAAGAGTCAGCTGGTGTGGATGGCATGCCATTCTGCTGCATTTGAAGATTTAAGATTGTTAAGCTTCATCAGAGGGACCAAAGTATCTCCGCGGGGGAAACTTTCAACTAGAGGAGTACAAATTGCTTCAAATGAGAACATGGATAATATGGGATCGAGTACTCTTGAACTGAGAAGCGGGTACTGGGCCATAAGGACCAGGAGTGGAGGAAACACTAATCAACAGAGGGCCTCCGCAGGCCAAATCAGTGTGCAACCTACGTTTTCTGTACAAAGAAACCTCCCATTTGAAAAGTCAACCGTCATGGCAGCATTCACTGGAAATACGGAGGGAAGAACCTCAGACATGAGGGCAGAAATCATAAGAATGATGGAAGGTGCAAAACCAGAAGAAGTGTCGTTCCGAGGGAGGGGAGTTTTCGAGCTCTCAGACGAGAAGGCGACGAACCCGATCGTGCCCTCTTTTGACATGAGTAATGAAGGATCTTATTTCTTCGGAGACAATGCAGAAGAGTACGACAATTAAGGAAAAAATACCCTTGNNNNNNNN

NP (1566 bp)

## Nature: cDNA\_pHW2000

## Source: GATC sequences from Maxiprep\_RPS\_2023

AGCAAAAGCAGGGTTAATAATCACTCACTGAGTGACATCAAAATC**ATG**GCGTCCCAAGGCACCAAACGGTCTTATGAACAGATGGAAACTGATGGGGATCGCCAGAATGCAACTGAGATTAGGGCATCCGTCGGGAAGATGATTGATGGAATTGGGAGATTCTACATCCAAATGTGCACTGAACTTAAACTCAGTGATTATGAAGGGCGGTTGATCCAGAACAGCTTGACAATAGAGAAAATGGTGCTCTCTGCTTTTGATGAGAGAAGGAATAAATATCTGGAAGAACACCCCAGCGCGGGGAAAGATCCTAAGAAAACTGGAGGGCCCATATACAGGAGAGTAGATGGAAAATGGATGAGGGAACTCGTCCTTTATGACAAAGGAGAAATAAGGCGAATCTGGCGCCAAGCCAACAATGGTGAGGATGCGACAGCTGGTCTAACTCACATGATGATCTGGCATTCCAATTTGAATGATACAACATACCAGAGGACAAGAGCTCTTGTTCGAACCGGAATGGATCCCAGAATGTGCTCTCTGATGCAGGGCTCGACTCTCCCTAGAAGGTCCGGAGCTGCAGGTGCTGCAGTCAAAGGAATCGGGACAATGGTGATGGAGCTGATCAGAATGGTCAAACGGGGGATCAACGATCGAAATTTCTGGAGAGGTGAGAATGGGCGGAAAACAAGAAGTGCTTATGAGAGAATGTGCAACATTCTTAAAGGAAAATTTCAAACAGCTGCACAAAGAGCAATGGTGGATCAAGTGAGAGAAAGTCGGAACCCAGGAAATGCTGAGATCGAAGATCTCATATTTTTGGCAAGATCTGCATTGATATTGAGAGGGTCAGTTGCTCACAAATCTTGCCTACCTGCCTGTGTGTATGGACCTGCAGTATCCAGTGGGTACGACTTCGAAAAAGAGGGATATTCCTTGGTGGGAATAGACCCTTTCAAACTACTTCAAAATAGCCAAGTATACAGCCTAATCAGACCTAACGAGAATCCAGCACACAAGAGTCAGCTGGTGTGGATGGCATGCCATTCTGCTGCATTTGAAGATTTAAGATTGTTAAGCTTCATCAGAGGGACCAAAGTATCTCCGCGGGGGAAACTTTCAACTAGAGGAGTACAAATTGCTTCAAATGAGAACATGGATAATATGGGATCGAGTACTCTTGAACTGAGAAGCGGGTACTGGGCCATAAGGACCAGGAGTGGAGGAAACACTAATCAACAGAGGGCCTCCGCAGGCCAAATCAGTGTGCAACCTACGTTTTCTGTACAAAGAAACCTCCCATTTGAAAAGTCAACCGTCATGGCAGCATTCACTGGAAATACGGAGGGAAGAACCTCAGACATGAGGGCAGAAATCATAAGAATGATGGAAGGTGCAAAACCAGAAGAAGTGTCGTTCCGAGGGAGGGGAGTTTTCGAGCTCTCAGACGAGAAGGCGACGAACCCGATCGTGCCCTCTTTTGACATGAGTAATGAAGGATCTTATTTCTTCGGAGACAATGCAGAAGAGTACGACAAT**TAA**GGAAAAAATACCCTTGTTTCTACT

NA (1466 bp)

## Nature: cRNA

## Source: DQ487331.1 Influenza A virus (A/Moscow/10/99(H3N2)) segment 6

AGCAAAAGCAGGAGTAAAGATGAATCCAAATCAAAAGATAATAACGATTGGCTCTGTTTCTCTCACCATT

GCCACAATATGCTTCCTTATGCAAATTGCCATCCTGGTAACTACTGTAACATTGCATTTCAAGCAATATG

AATGCAACTCCCCCCCAAACAACCAAGTGATGCTGTGTGAACCAACAATAATAGAAAGAAACATAACAGA

GATAGTGTATCTGACCAACACCACCATAGAGAAGGAAATATGCCCCAAACTAGCAAAATACAGAAATTGG

TCAAAGCCGCAATGTAACATTACAGGATTTGCACCTTTTTCTAAGGACAATTCGATTCGGCTTTCCGCTR

GTGGGGACATCTGGGTGACAAGAGAACCTTATGTGTCATGCGATCCTGACAAGTGTTATCAATTTGCCCT

TGGACAGGGAACAACACTAAACAACGGGCATTCAAATGACACAGTACATGATAGGACCCCTTATCGGACC

CTATTGATGAATGAGTTGGGTGTTCCATTTCATTTGGGAACCAAACAAGTGTGCATAGCATGGTCCAGCT

CAAGTTGTCACGATGGAAAAGCATGGCTGCATGTTTGTGTAACGGGGGATGATGAAAATGCAACTGCTAG

CTTCATTTACAATGGGAGGCTTGTAGATAGTATTGGTTCATGGTCCAAAAAAATCCTCAGGACCCAGGAG

TCGGAATGCGTTTGTATCAATGGAACTTGTACAGTAGTAATGACTGATGGGAGTGCTTCAGGAAAAGCTG

ATACTAAAATACTATTCATTGAGGAGGGGAAAATCGTTCATACTAGCCCATTGTCAGGAAGTGCTCAGCA

TGTCGAGGARTGCTCCTGTTATCCTCGATATCCTGGTGTCAGATGTGTCTGCAGAGACAACTGGAAAGGC

TCCAATAGGCCCATCGTAGATATAAATGTAAAGGATTATAGCATTGTTTCCAGTTATGTGTGCTCAGGAC

TTGTTGGAGACACACCCAGAAAAAACGACAGCTCCAGCAGTAGCCATTGCTTGGATCCTAACAATGAGGA

AGGTGGTCATGGAGTGAAAGGCTGGGCCTTTGATGATGGAAATGACGTGTGGATGGGAAGAACGATCAGC

GAGAAGTTACGCTCAGGATATGAAACCTTCAAAGTCATTGAAGGCTGGTCCAAACCYAACTCCAAATTGC

AGATAAATAGGCAAGTCATAGTTGACAGAGGTAATAGGTCCGGTTATTCTGGTATTTTCTCTGTTGAAGG

CAAAAGCTGCATCAATCGGTGCTTTTATGTGGAGTTGATAAGGGGAAGGAAACAGGAAACTGAAGTCTTG

TGGACCTCAAACAGTATTGTTGTGTTTTGTGGCACCTCAGGTACATATGGAACAGGCTCATGGCCTGATG

GGGCGGACATCAATCTCATGCCTATATAAGCTTTCGCAATTTTAGAAAAAAMTCCTTGTTTCTACT

NA protein

## Source: ABE73101.1 (469 aa) polymerase PB2

## Sequence: 84- 466

MNPNQKIITIGSVSLTIATICFLMQIAILVTTVTLHFKQYECNSPPNNQVMLCEPTIIERNITEIVYLTN

TTIEKEICPKLAKYRNWSKPQCNITGFAPFSKDNSIRLSAXGDIWVTREPYVSCDPDKCYQFALGQGTTL

NNGHSNDTVHDRTPYRTLLMNELGVPFHLGTKQVCIAWSSSSCHDGKAWLHVCVTGDDENATASFIYNGR

LVDSIGSWSKKILRTQESECVCINGTCTVVMTDGSASGKADTKILFIEEGKIVHTSPLSGSAQHVEECSC

YPRYPGVRCVCRDNWKGSNRPIVDINVKDYSIVSSYVCSGLVGDTPRKNDSSSSSHCLDPNNEEGGHGVK

GWAFDDGNDVWMGRTISEKLRSGYETFKVIEGWSKPNSKLQINRQVIVDRGNRSGYSGIFSVEGKSCINR

CFYVELIRGRKQETEVLWTSNSIVVFCGTSGTYGTGSWPDGADINLMPI

NA (1466 bp)

## Nature: vRNA

## Source: Illumina sequences from virus stocks\_RPS2022

NNNNNNAGCAGGAGTAAAGATGAATCCAAATCAAAAGATAATAACGATTGGCTCTGTTTCTCTCACCATTGCCACAATATGCTTCCTTATGCAAATTGCCATCCTGGTAACTACTGTAACATTGCATTTCAAGCAATATGAATGCAACTCCCCCCCAAACAACCAAGTGATGCTGTGTGAACCAACAATAATAGAAAGAAACATAACAGAGATAGTGTATCTGACCAACACCACCATAGAGAAGGAAATATGCCCCAAACTAGCAGAATACAGAAATTGGTCAAAGCCGCAATGTAACATTACAGGATTTGCACCTTTTTCTAAGGACAATTCGATTCGGCTTTCCGCTGGTGGGGACATCTGGGTGACAAGAGAACCTTATGTGTCATGCGATCCTGACAAGTGTTATCAATTTGCCCTTGGACAGGGAACAACACTAAACAACGGGCATTCAAATGACACAGTACATGATAGGACCCCTTATCGGACCCTATTGATGAATGAGTTGGGTGTTCCATTTCATTTGGGAACCAAGCAAGTGTGCATAGCATGGTCCAGCTCAAGTTGTCACGATGGAAAAGCATGGCTGCATGTTTGTGTAACGGGGGATGATGAAAATGCAACTGCTAGCTTCATTTACAATGGGAGGCTTGTAGATAGTATTGGTTCATGGTCCAAAAAAATCCTCAGGACCCAGGAGTCGGAATGCGTTTGTATCAATGGAACTTGTACAGTAGTAATGACTGATGGGAGTGCTTCAGGAAAAGCTGATACTAAAATACTATTCATTGAGGAGGGGAAAATCGTTCATACTAGCCCATTGTCAGGAAGTGCTCAGCATGTCGAGGAATGCTCCTGTTATCCTCGATATCCTGGTGTCAGATGTGTCTGCAGAGACAACTGGAAAGGCTCCAATAGGCCCATCGTAGATATAAATGTAAAGGATTATAGCATTGTTTCCAGTTATGTGTGCTCAGGACTTGTTGGAGACACACCCAGAAAAAACGACAGCTCCAGCAGTAGCCATTGCTTGGATCCTAACAATGAGGAAGGTGGTCATGGAGTGAAAGGCTGGGCCTTTGATGATGGAAATGACGTGTGGATGGGAAGAACGATCAGCGAGAAGTTACGCTCAGGATATGAAACCTTCAAAGTCATTGAAGGCTGGTCCAAACCCAACTCCAAATTGCAGATAAATAGGCAAGTCATAGTTGACAGAGGTAATAGGTCCGGTTATTCTGGTATTTTCTCTGTTGAAGGCAAAAGCTGCATCAATCGGTGCTTTTATGTGGAGTTGATAAGGGGAAGGAAACAGGAAACTGAAGTCTTGTGGACCTCAAACAGTATTGTTGTGTTTTGTGGCACCTCAGGTACATATGGAACAGGCTCATGGCCTGATGGGGCGGACATCAATCTCATGCCTATATAAGCTTTCGCAATTTTAGAAAAAACTNNNNNNNNNNNNN

NA (1466 bp)

## Nature: cDNA\_pHW2000

## Source: GATC sequences from Maxiprep\_RPS\_2023

AGCAAAAGCAGGAGTAAAG**ATG**AATCCAAATCAAAAGATAATAACGATTGGCTCTGTTTCTCTCACCATTGCCACAATATGCTTCCTTATGCAAATTGCCATCCTGGTAACTACTGTAACATTGCATTTCAAGCAATATGAATGCAACTCCCCCCCAAACAACCAAGTGATGCTGTGTGAACCAACAATAATAGAAAGAAACATAACAGAGATAGTGTATCTGACCAACACCACCATAGAGAAGGAAATATGCCCCAAACTAGCAGAATACAGAAATTGGTCAAAGCCGCAATGTAACATTACAGGATTTGCACCTTTTTCTAAGGACAATTCGATTCGGCTTTCCGCTGGTGGGGACATCTGGGTGACAAGAGAACCTTATGTGTCATGCGATCCTGACAAGTGTTATCAATTTGCCCTTGGACAGGGAACAACACTAAACAACGGGCATTCAAATGACACAGTACATGATAGGACCCCTTATCGGACCCTATTGATGAATGAGTTGGGTGTTCCATTTCATTTGGGAACCAAGCAAGTGTGCATAGCATGGTCCAGCTCAAGTTGTCACGATGGAAAAGCATGGCTGCATGTTTGTGTAACGGGGGATGATGAAAATGCAACTGCTAGCTTCATTTACAATGGGAGGCTTGTAGATAGTATTGGTTCATGGTCCAAAAAAATCCTCAGGACCCAGGAGTCGGAATGCGTTTGTATCAATGGAACTTGTACAGTAGTAATGACTGATGGGAGTGCTTCAGGAAAAGCTGATACTAAAATACTATTCATTGAGGAGGGGAAAATCGTTCATACTAGCCCATTGTCAGGAAGTGCTCAGCATGTCGAGGAATGCTCCTGTTATCCTCGATATCCTGGTGTCAGATGTGTCTGCAGAGACAACTGGAAAGGCTCCAATAGGCCCATCGTAGATATAAATGTAAAGGATTATAGCATTGTTTCCAGTTATGTGTGCTCAGGACTTGTTGGAGACACACCCAGAAAAAACGACAGCTCCAGCAGTAGCCATTGCTTGGATCCTAACAATGAGGAAGGTGGTCATGGAGTGAAAGGCTGGGCCTTTGATGATGGAAATGACGTGTGGATGGGAAGAACGATCAGCGAGAAGTTACGCTCAGGATATGAAACCTTCAAAGTCATTGAAGGCTGGTCCAAACCCAACTCCAAATTGCAGATAAATAGGCAAGTCATAGTTGACAGAGGTAATAGGTCCGGTTATTCTGGTATTTTCTCTGTTGAAGGCAAAAGCTGCATCAATCGGTGCTTTTATGTGGAGTTGATAAGGGGAAGGAAACAGGAAACTGAAGTCTTGTGGACCTCAAACAGTATTGTTGTGTTTTGTGGCACCTCAGGTACATATGGAACAGGCTCATGGCCTGATGGGGCGGACATCAATCTCATGCCTATA**TAA**GCTTTCGCAATTTTAGAAAAAACTCCTTGTTTCTACT

M (1027 bp)

## Nature: cRNA

## Source: DQ487329.1 Influenza A virus (A/Moscow/10/99(H3N2)) segment 7

AGCAAAAGCAGGTAGATATTGAAAGATGAGCCTTCTAACCGAGGTCGAAACGTATGTTCTCTCTATCGTT

CCATCAGGCCCCCTCAAAGCCGAAATCGCGCAGAGACTTGAAGATGTCTTTGCTGGGAAAAACACAGATC

TTGAGGCTCTCATGGAATGGCTAAAGACAAGACCAATCCTGTCACCTCTGACTAAGGGGATTTTGGGGTT

TGTGTTCACGCTCACCGTGCCCAGTGAGCGAGGACTGCAGCGTAGACGCTTTGTCCAAAATGCCCTCAAT

GGGAATGGGGATCCAAATAACATGGACAAAGCAGTTAAACTGTATAGAAAACTTAAGAGGGAGATAACAT

TCCATGGGGCCAAAGAAATAGCACTCAGTTATTCTGCTGGTGCACTTGCCAGTTGCATGGGCCTCATATA

CAATAGGATGGGGGCTGTAACCACTGAAGTGGCATTTGGCCTGGTATGTGCAACATGTGAACAGATTGCT

GACTCCCAGCACAGGTCTCATAGGCAAATGGTGGCAACAACCAATCCATTAATAAGACATGAGAACAGAA

TGGTTTTGGCCAGCACTACAGCTAAGGCTATGGAGCAAATGGCTGGATCAAGTGAGCAGGCAGCGGAGGC

CATGGAGATTGCTAGTCAGGCCAGGCAAATGGTGCAGGCAATGAGAGCCGTTGGGACTCATCCTAGCTCC

AGTACTGGTCTAAGAGATGATCTTCTTGAAAATTTGCAGACCTATCAGAAACGAATGGGGGTGCAGATGC

AACGATTCAAGTGACCCGCTTGTTGTTGCCGCGAATATCATTGGGATCTTGCACTTGATATTGTGGATTC

TTGATCGTCTTTTTTTCAAATGCATCTATCGACTCTTCAAACACGGCCTTAAAAGAGGGCCTTCTACGGA

AGGAGTACCTGAGTCTATGAGGGAAGAATATCGAAAGGARCAGCAGAATGCTGTGGATGCTGACGACAGT

CATTTTGTCAGCATAGAGTTGGAGTAAAAAACTACCTTGTTTCTACT

M1 protein

## Source: ABE73098.1 (252 aa)

## Sequence: 26 - 784

MSLLTEVETYVLSIVPSGPLKAEIAQRLEDVFAGKNTDLEALMEWLKTRPILSPLTKGILGFVFTLTVPS

ERGLQRRRFVQNALNGNGDPNNMDKAVKLYRKLKREITFHGAKEIALSYSAGALASCMGLIYNRMGAVTT

EVAFGLVCATCEQIADSQHRSHRQMVATTNPLIRHENRMVLASTTAKAMEQMAGSSEQAAEAMEIASQAR

QMVQAMRAVGTHPSSSTGLRDDLLENLQTYQKRMGVQMQRFK

M2 protein

## Source: ABE73099.1 (97 aa)

## Sequence: 26 - 1007

MSLLTEVETPIRNEWGCRCNDSSDPLVVAANIIGILHLILWILDRLFFKCIYRLFKHGLKRGPSTEGVPE

SMREEYRKEQQNAVDADDSHFVSIELE

M (1027 bp)

## Nature: vRNA

## Source: Illumina sequences from virus stocks\_RPS2022

NNNNNNNGCAGGTAGATATTGAAAGATGAGCCTTCTAACCGAGGTCGAAACGTATGTTCTCTCTATCGTTCCATCAGGCCCCCTCAAAGCCGAAATCGCGCAGAGACTTGAAGATGTCTTTGCTGGGAAAAACACAGATCTTGAGGCTCTCATGGAATGGCTAAAGACAAGACCAATCCTGTCACCTCTGACTAAGGGGATTTTGGGGTTTGTGTTCACGCTCACCGTGCCCAGTGAGCGAGGACTGCAGCGTAGACGCTTTGTCCAAAATGCCCTCAATGGGAATGGGGATCCAAATAACATGGACAAAGCAGTTAAACTGTATAGAAAACTTAAGAGGGAGATAACATTCCATGGGGCCAAAGAAATAGCACTCAGTTATTCTGCTGGTGCACTTGCCAGTTGCATGGGCCTCATATACAATAGGATGGGGGCTGTAACCACTGAAGTGGCATTTGGCCTGGTATGTGCAACATGTGAACAGATTGCTGACTCCCAGCACAGGTCTCATAGGCAAATGGTGGCAACAACCAATCCATTAATAAGACATGAGAACAGAATGGTTTTGGCCAGCACTACAGCTAAGGCTATGGAGCAAATGGCTGGATCAAGTGAGCAGGCAGCGGAGGCCATGGAGATTGCTAGTCAGGCCAGGCAAATGGTGCAGGCAATGAGAGCCGTTGGGACTCATCCTAGCTCCAGTACTGGTCTAAGAGATGATCTTCTTGAAAATTTGCAGACCTATCAGAAACGAATGGGGGTGCAGATGCAACGATTCAAGTGACCCGCTTGTTGTTGCCGCGAATATCATTGGGATCTTGCACTTGATATTGTGGATTCTTGATCGTCTTTTTTTCAAATGCATCTATCGACTCTTCAAACACGGCCTTAAAAGAGGGCCTTCTACGGAAGGAGTACCTGAGTCTATGAGGGAAGAATATCGAAAGGAACAGCAGAATGCTGTGGATGCTGACGACAGTCATTTTGTCAGCATAGAGTTGGAGTAAAAAACTACNNNNNNNNNNNN

M (1027 bp)

## Nature: cDNA\_pHW2000

## Source: GATC sequences from Maxiprep\_RPS\_2023

AGCAAAAGCAGGTAGATATTGAAAG**ATG**AGCCTTCTAACCGAGGTCGAAACGTATGTTCTCTCTATCGTTCCATCAGGCCCCCTCAAAGCCGAAATCGCGCAGAGACTTGAAGATGTCTTTGCTGGGAAAAACACAGATCTTGAGGCTCTCATGGAATGGCTAAAGACAAGACCAATCCTGTCACCTCTGACTAAGGGGATTTTGGGGTTTGTGTTCACGCTCACCGTGCCCAGTGAGCGAGGACTGCAGCGTAGACGCTTTGTCCAAAATGCCCTCAATGGGAATGGGGATCCAAATAACATGGACAAAGCAGTTAAACTGTATAGAAAACTTAAGAGGGAGATAACATTCCATGGGGCCAAAGAAATAGCACTCAGTTATTCTGCTGGTGCACTTGCCAGTTGCATGGGCCTCATATACAATAGGATGGGGGCTGTAACCACTGAAGTGGCATTTGGCCTGGTATGTGCAACATGTGAACAGATTGCTGACTCCCAGCACAGGTCTCATAGGCAAATGGTGGCAACAACCAATCCATTAATAAGACATGAGAACAGAATGGTTTTGGCCAGCACTACAGCTAAGGCTATGGAGCAAATGGCTGGATCAAGTGAGCAGGCAGCGGAGGCCATGGAGATTGCTAGTCAGGCCAGGCAAATGGTGCAGGCAATGAGAGCCGTTGGGACTCATCCTAGCTCCAGTACTGGTCTAAGAGATGATCTTCTTGAAAATTTGCAGACCTATCAGAAACGAATGGGGGTGCAGATGCAACGATTCAAGTGACCCGCTTGTTGTTGCCGCGAATATCATTGGGATCTTGCACTTGATATTGTGGATTCTTGATCGTCTTTTTTTCAAATGCATCTATCGACTCTTCAAACACGGCCTTAAAAGAGGGCCTTCTACGGAAGGAGTACCTGAGTCTATGAGGGAAGAATATCGAAAGGAACAGCAGAATGCTGTGGATGC**TGA**CGACAGTCATTTTGTCAGCATAGAGTTGGAGTAAAAAACTACCTTGTTTCTACT

NS (890 bp)

## Nature: cRNA

## Source: DQ487332.1 Influenza A virus (A/Moscow/10/99(H3N2)) segment 8

AGCAAAAGCAGGGTGACAAAGACATAATGGATTCCAACACTGTGTCAAGTTTCCAGGTAGATTGCTTTCT

TTGGCATATCCGGAAACAAGTTGTAGACCAAGAACTGAGTGATGCCCCATTCCTTGATCGGCTTCGCCGA

GATCAGAGGTCCCTAAGGGGAAGAGGCAACACTCTCGGTCTAGACATCAAAGCAGCCACCCATGTTGGAA

AGCAAATTGTAGAAAAGATTCTGAAAGAAGAATCTGATGAGGCACTTAAAATGACCATGGTCTCCACACC

TGCTTCGCGATACATAACTGACATGACTATTGAGGAATTGTCAAGAAACTGGTTCATGCTAATGCCCAAG

CAGAAAGTGGAAGGACCTCTTTGCATCAGAATGGACCAGGCAATCATGGAGAAAAACATCATGTTGAAAG

CGAATTTCAGTGTGATCTTTGACCGACTAGAGACCATAGTATTACTAAGGGCTTTCACCGAAGAGGGAGC

AATTGTTGGCGAAATCTCACCATTGCCTTCTTTTCCAGGACATACTATTGAGGATGTCAAAAATGCAATT

GGGGTCCTCATCGGAGGACTTGAATGGAATGATAACACAGTTCGAGTCTCTAAAAATCTACAGAGATTCG

CTTGGAGAAGCAGTAATGAGAATGGGGGACCTCCACTTACTCCAAAACAGAAACGGAAAATGGCGAGAAC

AGCTAGGTCAAAAGTTTGAAGAGATAAGATGGCTGATTGAAGAAGTGAGACACAGACTAAAAACAACTGA

AAATAGCTTTGAGCAAATAACATTCATGCAAGCATTACAGCTGCTGTTTGAAGTGGAACAGGAGATAAGA

ACTTTCTCATTTCAGCTTATTTAATGATAAAAAACACCCTTGTTTCTACT

NS1 protein

## Source: ABE73102.1 (230 aa)

## Sequence: 27 - 719

MDSNTVSSFQVDCFLWHIRKQVVDQELSDAPFLDRLRRDQRSLRGRGNTLGLDIKAATHVGKQIVEKILK

EESDEALKMTMVSTPASRYITDMTIEELSRNWFMLMPKQKVEGPLCIRMDQAIMEKNIMLKANFSVIFDR

LETIVLLRAFTEEGAIVGEISPLPSFPGHTIEDVKNAIGVLIGGLEWNDNTVRVSKNLQRFAWRSSNENG

GPPLTPKQKRKMARTARSKV

NS2 protein

## Source: ABE73103.1 (121 aa)

## Sequence: 27 - 864

MDSNTVSSFQDILLRMSKMQLGSSSEDLNGMITQFESLKIYRDSLGEAVMRMGDLHLLQNRNGKWREQLG

QKFEEIRWLIEEVRHRLKTTENSFEQITFMQALQLLFEVEQEIRTFSFQLI

NS (890 bp)

## Nature: vRNA

## Source: Illumina sequences from virus stocks\_RPS2022

NGCAAAAGCAGGGTGACAAAGACATAATGGATTCCAACACTGTGTCAAGTTTCCAGGTAGATTGCTTTCTTTGGCATATCCGGAAACAAGTTGTAGACCAAGAACTGAGTGATGCCCCATTCCTTGATCGGCTTCGCCGAGATCAGAGGTCCCTAAGGGGAAGAGGCAACACTCTCGGTCTAGACATCAAAGCAGCCACCCATGTTGGAAAGCAAATTGTAGAAAAGATTCTGAAAGAAGAATCTGATGAGGCACTTAAAATGACCATGGTCTCCACACCTGCTTCGCGATACATAACTGACATGACTATTGAGGAATTGTCAAGAAACTGGTTCATGCTAATGCCCAAGCAGAAAGTGGAAGGACCTCTTTGCATCAGAATGGACCAGGCAATCATGGAGAAAAACATCATGTTGAAAGCGAATTTCAGTGTGATCTTTGACCGACTAGAGACCATAGTATTACTAAGGGCTTTCACCGAAGAGGGAGCAATTGTTGGCGAAATCTCACCATTGCCTTCTTTTCCAGGACATACTATTGAGGATGTCAAAAATGCAATTGGGGTCCTCATCGGAGGACTTGAATGGAATGATAACACAGTTCGAGTCTCTAAAAATCTACAGAGATTCGCTTGGAGAAGCAGTAATGAGAATGGGGGACCTCCACTTACTCCAAAACAGAAACGGAAAATGGCGAGAACAGCTAGGTCAAAAGTTTGAAGAGATAAGATGGCTGATTGAAGAAGTGAGACACAGACTAAAAACAACTGAAAATAGCTTTGAGCAAATAACATTCATGCAAGCATTACAGCTGCTGTTTGAAGTGGAACAGGAGATAAGAACTTTCTCATTTCAGCTTATTTAATGATAAAAAACACNNNNNNNNNNNNN

NS (890 bp)

## Nature: cDNA\_pHW2000

## Source: GATC sequences from Maxiprep\_RPS\_2023

AGCAAAAGCAGGGTGACAAAGACATA**ATG**GATTCCAACACTGTGTCAAGTTTCCAGGTAGATTGCTTTCTTTGGCATATCCGGAAACAAGTTGTAGACCAAGAACTGAGTGATGCCCCATTCCTTGATCGGCTTCGCCGAGATCAGAGGTCCCTAAGGGGAAGAGGCAACACTCTCGGTCTAGACATCAAAGCAGCCACCCATGTTGGAAAGCAAATTGTAGAAAAGATTCTGAAAGAAGAATCTGATGAGGCACTTAAAATGACCATGGTCTCCACACCTGCTTCGCGATACATAACTGACATGACTATTGAGGAATTGTCAAGAAACTGGTTCATGCTAATGCCCAAGCAGAAAGTGGAAGGACCTCTTTGCATCAGAATGGACCAGGCAATCATGGAGAAAAACATCATGTTGAAAGCGAATTTCAGTGTGATCTTTGACCGACTAGAGACCATAGTATTACTAAGGGCTTTCACCGAAGAGGGAGCAATTGTTGGCGAAATCTCACCATTGCCTTCTTTTCCAGGACATACTATTGAGGATGTCAAAAATGCAATTGGGGTCCTCATCGGAGGACTTGAATGGAATGATAACACAGTTCGAGTCTCTAAAAATCTACAGAGATTCGCTTGGAGAAGCAGTAATGAGAATGGGGGACCTCCACTTACTCCAAAACAGAAACGGAAAATGGCGAGAACAGCTAGGTCAAAAGTTTGAAGAGATAAGATGGCTGATTGAAGAAGTGAGACACAGACTAAAAACAACTGAAAATAGCTTTGAGCAAATAACATTCATGCAAGCATTACAGCTGCTGTTTGAAGTGGAACAGGAGATAAGAACTTTCTCATTTCAGCTTATT**TAA**TGATAAAAAACACCCTTGTTTCTACT