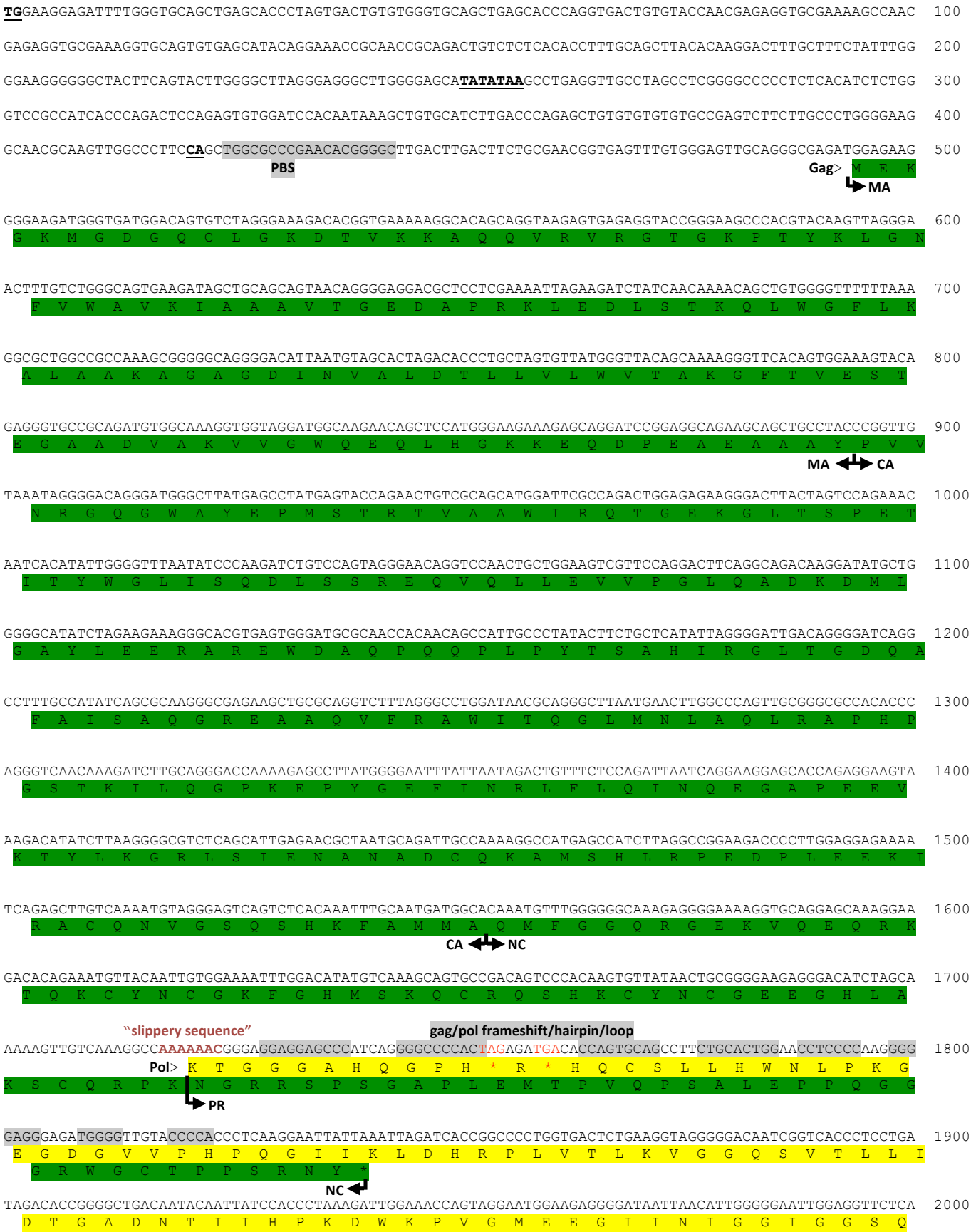

TGGAAGGAGATTTTGGGTGCAGCTGAGCACCCTAGTGACTGTGTGGGTGCAGCTGAGCACCCAGGTGACTGTGTACCAACGAGAGGTGCGAAAAGCCAAC 100
GAGAGGTGCGAAAGGTGCAGTGTGAGCATACAGGAAACCGCAACCGCAGACTGTCTCTCACACCTTTGCAGCTTACACAAGGACTTTGCTTTCTATTTGG 200
GGAAGGGGGGCTACTTCAGTACTTGGGGCTTAGGGAGGGCTTGGGGAGCATATATAAGCCTGAGGTTGCCTAGCCTCGGGGCCCCCTCTCACATCTCTGG 300
GTCCGCCATCACCCAGACTCCAGAGTGTGGATCCACAATAAAGCTGTGCATCTTGACCCAGAGCTGTGTGTGTGTGCCGAGTCTTCTTGCCCTGGGGAAG 400
GCAACGCAAGTTGGCCCTTCCAGCTGGCGCCCGAACACGGGGCTTGACTTGACTTCTGCGAACGGTGAGTTTGTGGGAGTTGCAGGGCGAGATGGAGAAG 500
PBS
Gag> M E K
MA
GGGAAGATGGGTGATGGACAGTGTCTAGGGAAAGACACGGTGAAAAAGGCACAGCAGGTAAGAGTGAGAGGTACCGGGAAGCCCACGTACAAGTTAGGGA 600
G K M G D G Q C L G K D T V K K A Q Q V R V R G T G K P T Y K L G N
ACTTTGTCTGGGCAGTGAAGATAGCTGCAGCAGTAACAGGGGAGGACGCTCCTCGAAAATTAGAAGATCTATCAACAAAACAGCTGTGGGGTTTTTTAAA 700
F V W A V K I A A A V T G E D A P R K L E D L S T K Q L W G F L K
GGCGCTGGCCGCCAAAGCGGGGGCAGGGGACATTAATGTAGCACTAGACACCCTGCTAGTGTTATGGGTTACAGCAAAAGGGTTCACAGTGGAAAGTACA 800
A L A A K A G A G D I N V A L D T L L V L W V T A K G F T V E S T
GAGGGTGCCGCAGATGTGGCAAAGGTGGTAGGATGGCAAGAACAGCTCCATGGGAAGAAAGAGCAGGATCCGGAGGCAGAAGCAGCTGCCTACCCGGTTG 900
E G A A D V A K V V G W Q E Q L H G K K E Q D P E A E A A A Y P V V
MA CA
TAAATAGGGGACAGGGATGGGCTTATGAGCCTATGAGTACCAGAACTGTCGCAGCATGGATTCGCCAGACTGGAGAGAAGGGACTTACTAGTCCAGAAAC 1000
N R G Q G W A Y E P M S T R T V A A W I R Q T G E K G L T S P E T
AATCACATATTGGGGTTTAATATCCCAAGATCTGTCCAGTAGGGAACAGGTCCAACTGCTGGAAGTCGTTCCAGGACTTCAGGCAGACAAGGATATGCTG 1100
I T Y W G L I S Q D L S S R E Q V Q L L E V V P G L Q A D K D M I
GGGGCATATCTAGAAGAAAGGGCACGTGAGTGGGATGCGCAACCACAACAGCCATTGCCCTATACTTCTGCTCATATTAGGGGATTGACAGGGGATCAGG 1200
G A Y L E E R A R E W D A Q P Q Q P L P Y T S A H I R G L T G D Q A
CCTTTGCCATATCAGCGCAAGGGCGAGAAGCTGCGCAGGTCTTTAGGGCCTGGATAACGCAGGGCTTAATGAACTTGGCCCAGTTGCGGGCGCCACACCC 1300
F A I S A Q G R E A A Q V F R A W I T Q G L M N L A Q L R A P H P
AGGGTCAACAAAGATCTTGCAGGGACCAAAAGAGCCTTATGGGGAATTTATTAATAGACTGTTTCTCCAGATTAATCAGGAAGGAGCACCAGAGGAAGTA 1400
G S T K I L Q G P K E P Y G E F I N R L F L Q I N Q E G A P E E V
AAGACATATCTTAAGGGGCGTCTCAGCATTGAGAACGCTAATGCAGATTGCCAAAAGGCCATGAGCCATCTTAGGCCGGAAGACCCCTTGGAGGAGAAAA 1500
K T Y L K G R L S I E N A N A D C Q K A M S H L R P E D P L E E K I
TCAGAGCTTGTCAAAATGTAGGGAGTCAGTCTCACAAATTTGCAATGATGGCACAAATGTTTGGGGGGCAAAGAGGGGAAAAGGTGCAGGAGCAAAGGAA 1600
R A C Q N V G S Q S H K F A M M A Q M F G G Q R G E K V Q E Q R K
CA NC
GACACAGAAATGTTACAATTGTGGAAAATTTGGACATATGTCAAAGCAGTGCCGACAGTCCCACAAGTGTTATAACTGCGGGGAAGAGGGACATCTAGCA 1700
T Q K C Y N C G K F G H M S K Q C R Q S H K C Y N C G E E G H L A
"slippery sequence"
gag/pol frameshift/hairpin/loop
AAAAGTTGTCAAAGGCCAAAAAACGGGAGGAGGAGCCCATCAGGGGCCCCACTAGAGATGACACCAGTGCAGCCTTCTGCACTGGAACCTCCCCAAGGGG 1800
Pol> K T G G G A H Q G P H * R * H Q C S L L H W N L P K G
K S C Q R P K N G R R S P S G A P L E M T P V Q P S A L E P P Q G G
PR
GAGGGAGATGGGGTTGTACCCCACCCTCAAGGAATTATTAAATTAGATCACCGGCCCCTGGTGACTCTGAAGGTAGGGGGACAATCGGTCACCCTCCTGA 1900
E G D G V V P H P Q G I I K L D H R P L V T L K V G G Q S V T L L I
G R W G C T P P S R N Y *
NC
TAGACACCGGGGCTGACAATACAATTATCCACCCTAAAGATTGGAAACCAGTAGGAATGGAAGAGGGGATAATTAACATTGGGGGAATTGGAGGTTCTCA 2000
D T G A D N T I I H P K D W K P V G M E E G I I N I G G I G G S Q

AAAGGGGGTATTATACAAACAAGTGCCTATTACTCTAGCAGATAGGCAGATACGGGGAACTGTCATAAGGGCAGTGACCCCTATAAATTTACTAGGGAGG 2100
K G V L Y K Q V P I T L A D R Q I R G T V I R A V T P I N L L G R

GACAATTTAGTATCACTAGGAATTGGAGTAGTGATGCTAATGGCACAGATGTCAGTAAAAATAGTGCCGCTGCCAGTTGAGTTAATGCCTGGCTGTGATG 2200
D N L V S L G I G V V M L M A Q M S V K I V P L P V E L M P G C D G

PR ◀▶ RT

GGCCAAGAGTAAAACAGTGGCCCCTTACGCAAGAGAAATATCAGGCTCTTGCTGAGATAGTATCTAAATTAGAAAAAGAGGGAAAAGTTAGTAGAGCAGA 2300
P R V K Q W P L T Q E K Y Q A L A E I V S K L E K E G K V S R A E

GGTAGGTAATCCCTACAACACTCCGGTGTTTGCCATTAAGAAAAAATCAGGCAAATGGAGAATGCTCATTGACTTTCGAGTGCTAAATGCTCGAACCAAA 2400
V G N P Y N T P V F A I K K K S G K W R M L I D F R V L N A R T K

AAGGGGGCTGAGTTTCAACTGGGCTTGCCCCACCCGGCAGGCCTACAAAAGAAAGATAATGTCACCATACTAGATATTGGTGATGCTTATTTTACCATAC 2500
K G A E F Q L G L P H P A G L Q K K D N V T I L D I G D A Y F T I P

CATTAGACCCCACATTTAAAAAGTACACTGCCTTTACTCTGATACCACCTAATAATCAGGGACCAGCCAGGAGATTTGTGTTTAATTGTCTACCACAAGG 2600
L D P T F K K Y T A F T L I P P N N Q G P A R R F V F N C L P Q G

GTGGGTGTGTAGTCCAGCCTTTTACCAAAGGACTATGAGTGACATCATACAGCCATGGAAACAAGCTCATCCTGAGGTCATGTTATATGTCTACATGGAT 2700
W V C S P A F Y Q R T M S D I I Q P W K Q A H P E V M L Y V Y M D

GACCTTCTAATCGGGACAGACCTCCCCTTGAGGGAGCATAGAAGGCTGGTCCAAGAGCTTAGGAGTATGCTTCTTGGCTGGGGCTTTGAAACTCCTGAAG 2800
D L L I G T D L P L R E H R R L V Q E L R S M L L G W G F E T P E E

AGAAAGTGCAGGACCAATGGCCACTACAGTGGATGGGGTATGAGTTACACCCTAATAAGTGGCAGTTGCAGGTCCGAAAATTAGAGTTACCAGATCACCC 2900
K V Q D Q W P L Q W M G Y E L H P N K W Q L Q V R K L E L P D H P

CACTTTAAATGAAGTCCAAAAACTGGTGGGAATTATTAATTGGGCTAGTCAAATTATATCAGGGCTTAAAATAAAGAAGCTTACTGCTATGATGGCAGGG 3000
T L N E V Q K L V G I I N W A S Q I I S G L K I K K L T A M M A G

AATCAGGATCTCAATAGAAAGATAGAATGGACTAAGGAAGCTAGAAAGGAAGCTGAAGAGGCAGCTAAGCTGCTCCAGGAGCTCCCAGCAGGGGGGTATG 3100
N Q D L N R K I E W T K E A R K E A E E A A K L L Q E L P A G G Y V

TCGACCCCTTGAAACAGGTGGAGGCTAGAATAGCTTTTGTAGGTTTCCGCGAGGTAGCCTACGACGTCCATCAGGAGAATATCATCCTTTGGTGTGGCAG 3200
D P L K Q V E A R I A F V G F R E V A Y D V H Q E N I I L W C G R

AGTAGGGTCCAGCAAAGCTCATTGTAATCCGGTGGACCTATGTGTAAAAGCAGCAATAAAAATAGGCAGGGAAACCTTGATTAGGCTAGGAGTGGTCCCC 3300
V G S S K A H C N P V D L C V K A A I K I G R E T L I R L G V V P

ATACTTACTGTCCCGGTAGCAAAAGATATCTGGGATAGTTTTGCATGGACTGCGGGGGAGGTAGCATGGTTCCCAGAAGTAAGACATCAGGCACCTCCTC 3400
I L T V P V A K D I W D S F A W T A G E V A W F P E V R H Q A P P L

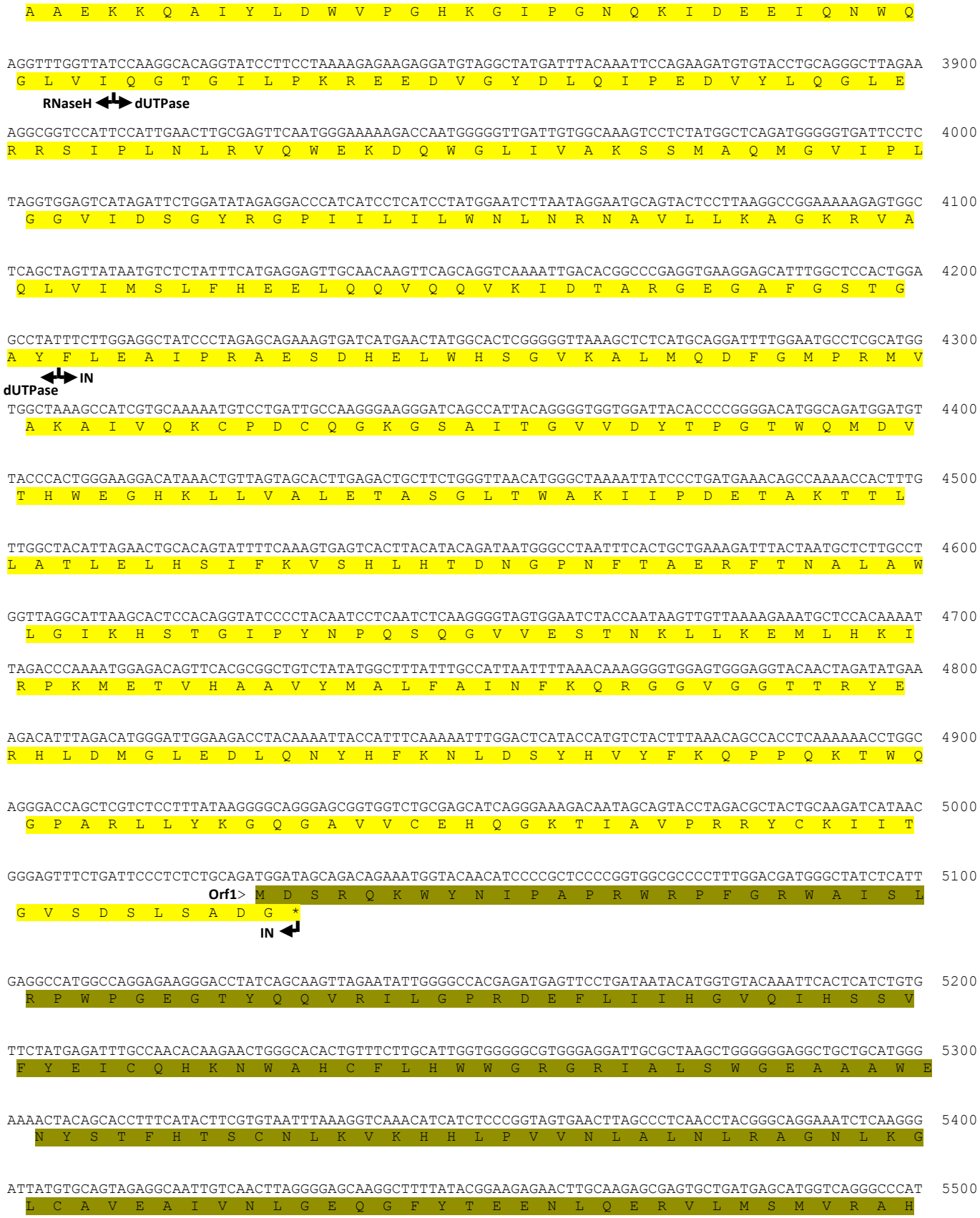
TAATAGTTGAGAGATGGATGAAAATGGTGTCAGAACCCATTAAGGGGGCAAGAACTTGGTATATCGATGGATCTAAGAAACGGGGCCAAAAAGCTAGAGC 3500
I V E R W M K M V S E P I K G A R T W Y I D G S K K R G Q K A R A

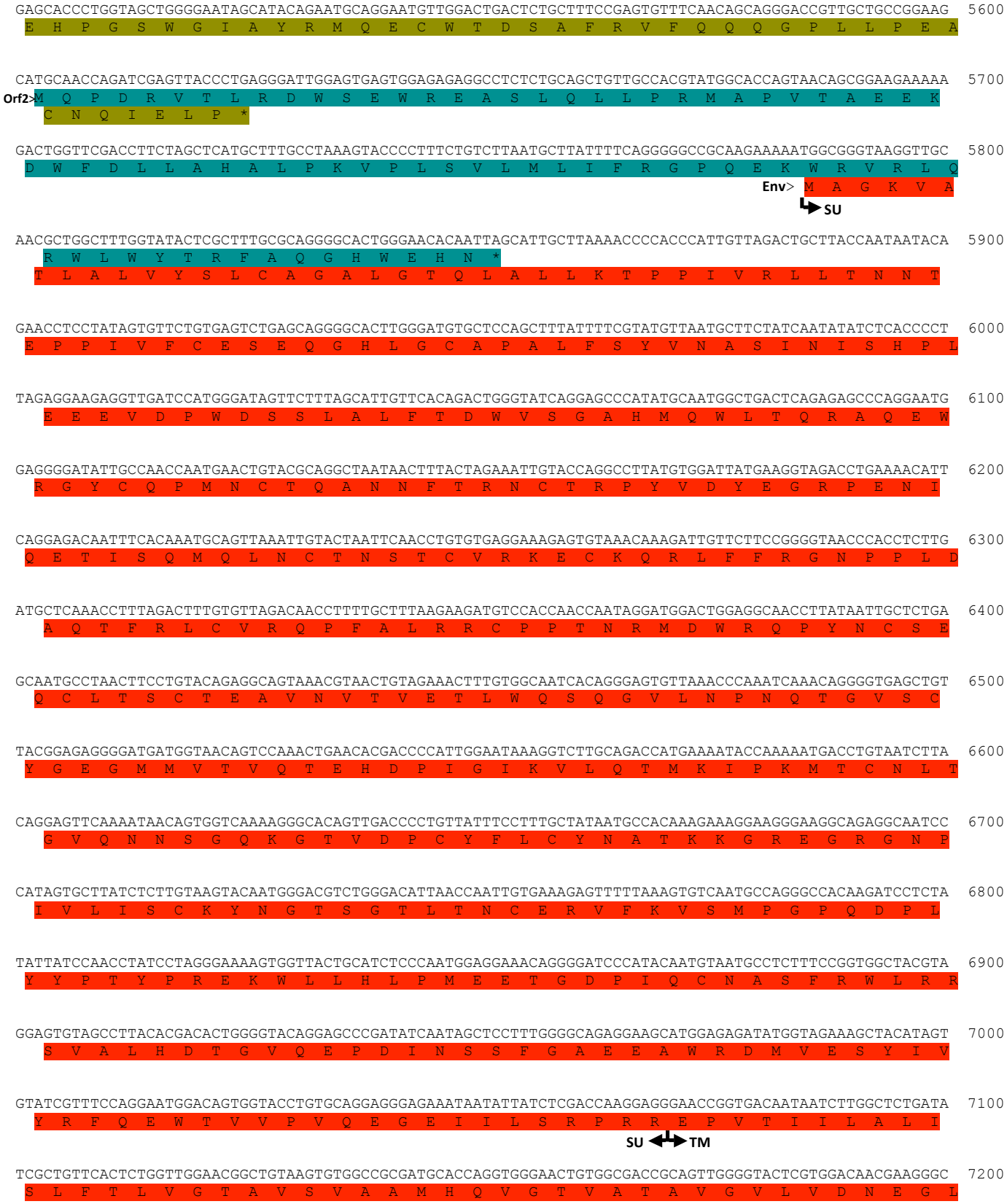
RT ◀▶ RNaseH

AGGAATTTGGACAGAGGGAGAGAAGGCACAAGTACAGGAACTGGAGAGCTCAAATCAAAAAGCAGAATTGGCAGCCTTGTTGTATGCCTTACAGCAGGAA 3600
G I W T E G E K A Q V Q E L E S S N Q K A E L A A L L Y A L Q Q E

GACAAAGAATTAAACATTATCACTGATTCTCAATATGTAATGAAAGTGATGCGACGCGAGCTATGGGTCAGCGATTCTCCCTTGGTTCAGAGCATCATAC 3700
D K E L N I I T D S Q Y V M K V M R R E L W V S D S P L V Q S I I Q

AAGCAGCAGAGAAAAAACAGGCTATCTATTTAGATTGGGTGCCAGGTCATAAGGGAATCCCAGGAAATCAGAAGATTGATGAAGAAATTCAAAATTGGCA 3800


A A E K K Q A I Y L D W V P G H K G I P G N Q K I D E E I Q N W Q
AGGTTTGGTTATCCAAGGCACAGGTATCCTTCCTAAAAGAGAAGAGGATGTAGGCTATGATTTACAAATTCCAGAAGATGTGTACCTGCAGGGCTTAGAA 3900
G L V I Q G T G I L P K R E E D V G Y D L Q I P E D V Y L Q G L E
RNaseH
dUTPase
AGGCGGTCCATTCCATTGAACTTGCGAGTTCAATGGGAAAAAGACCAATGGGGGTTGATTGTGGCAAAGTCCTCTATGGCTCAGATGGGGGTGATTCCTC 4000
R R S I P L N L R V Q W E K D Q W G L I V A K S S M A Q M G V I P L
TAGGTGGAGTCATAGATTCTGGATATAGAGGACCCATCATCCTCATCCTATGGAATCTTAATAGGAATGCAGTACTCCTTAAGGCCGGAAAAAGAGTGGC 4100
G G V I D S G Y R G P I I L I L W N L N R N A V L L K A G K R V A
TCAGCTAGTTATAATGTCTCTATTTCATGAGGAGTTGCAACAAGTTCAGCAGGTCAAAATTGACACGGCCCGAGGTGAAGGAGCATTTGGCTCCACTGGA 4200
Q L V I M S L F H E E L Q Q V Q Q V K I D T A R G E G A F G S T G
GCCTATTTCTTGGAGGCTATCCCTAGAGCAGAAAGTGATCATGAACTATGGCACTCGGGGGTTAAAGCTCTCATGCAGGATTTTGGAATGCCTCGCATGG 4300
A Y F L E A I P R A E S D H E L W H S G V K A L M Q D F G M P R M V
dUTPase
IN
TGGCTAAAGCCATCGTGCAAAAATGTCCTGATTGCCAAGGGAAGGGATCAGCCATTACAGGGGTGGTGGATTACACCCCGGGGACATGGCAGATGGATGT 4400
A K A I V Q K C P D C Q G K G S A I T G V V D Y T P G T W Q M D V
TACCCACTGGGAAGGACATAAACTGTTAGTAGCACTTGAGACTGCTTCTGGGTTAACATGGGCTAAAATTATCCCTGATGAAACAGCCAAAACCACTTTG 4500
T H W E G H K L L V A L E T A S G L T W A K I I P D E T A K T T L
TTGGCTACATTAGAACTGCACAGTATTTTCAAAGTGAGTCACTTACATACAGATAATGGGCCTAATTTCACTGCTGAAAGATTTACTAATGCTCTTGCCT 4600
L A T L E L H S I F K V S H L H T D N G P N F T A E R F T N A L A W
GGTTAGGCATTAAGCACTCCACAGGTATCCCCTACAATCCTCAATCTCAAGGGGTAGTGGAATCTACCAATAAGTTGTTAAAAGAAATGCTCCACAAAAT 4700
L G I K H S T G I P Y N P Q S Q G V V E S T N K L L K E M L H K I
TAGACCCAAAATGGAGACAGTTCACGCGGCTGTCTATATGGCTTTATTTGCCATTAATTTTAAACAAAGGGGTGGAGTGGGAGGTACAACTAGATATGAA 4800
R P K M E T V H A A V Y M A L F A I N F K Q R G G V G G T T R Y E
AGACATTTAGACATGGGATTGGAAGACCTACAAAATTACCATTTCAAAAATTTGGACTCATACCATGTCTACTTTAAACAGCCACCTCAAAAAACCTGGC 4900
R H L D M G L E D L Q N Y H F K N L D S Y H V Y F K Q P P Q K T W Q
AGGGACCAGCTCGTCTCCTTTATAAGGGGCAGGGAGCGGTGGTCTGCGAGCATCAGGGAAAGACAATAGCAGTACCTAGACGCTACTGCAAGATCATAAC 5000
G P A R L L Y K G Q G A V V C E H Q G K T I A V P R R Y C K I I T
GGGAGTTTCTGATTCCCTCTCTGCAGATGGATAGCAGACAGAAATGGTACAACATCCCCGCTCCCCGGTGGCGCCCCTTTGGACGATGGGCTATCTCATT 5100
Orf1>
M D S R Q K W Y N I P A P R W R P F G R W A I S L
G V S D S L S A D G *
IN
GAGGCCATGGCCAGGAGAAGGGACCTATCAGCAAGTTAGAATATTGGGGCCACGAGATGAGTTCCTGATAATACATGGTGTACAAATTCACTCATCTGTG 5200
R P W P G E G T Y Q Q V R I L G P R D E F L I I H G V Q I H S S V
TTCTATGAGATTTGCCAACACAAGAACTGGGCACACTGTTTCTTGCATTGGTGGGGGCGTGGGAGGATTGCGCTAAGCTGGGGGGAGGCTGCTGCATGGG 5300
F Y E I C Q H K N W A H C F L H W W G R G R I A L S W G E A A A W E
AAAACTACAGCACCTTTCATACTTCGTGTAATTTAAAGGTCAAACATCATCTCCCGGTAGTGAACTTAGCCCTCAACCTACGGGCAGGAAATCTCAAGGG 5400
N Y S T F H T S C N L K V K H H L P V V N L A L N L R A G N L K G
ATTATGTGCAGTAGAGGCAATTGTCAACTTAGGGGAGCAAGGCTTTTATACGGAAGAGAACTTGCAAGAGCGAGTGCTGATGAGCATGGTCAGGGCCCAT 5500
L C A V E A I V N L G E Q G F Y T E E N L Q E R V L M S M V R A H


Orf2>
Env>
SU
SU
TM

NES	Nuclear export signal
NLS	Nuclear localization signal
RT	Reverse transcriptase
IN	Integrase
PBS	Primer binding site
PPT	Polypurine tract
CA	Capsid
MA	Matrix
NC	Nucleocapsid
TM	Envelope transmembrane protein
SU	Envelope surface protein