```
                                         10        20        30        40        50        60        70        80        90       100
                              ....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|
CV777/Belgium/AF3353511       MASVSFQDRGRKRVPLSLYAPLRVTNDKPLSKVLANNAVPTNKGNKDQQIGYWNEQIRWRMRRGERIEQPSNWHFYYLGTGPHGDLRYRTRTEGVFWVAK
CV777/CN/KT323979             ....................................................................................................
AJ1102/CN/JX188454            ..........................N..........................T.............................A................
SM98/Korea/GU937797           ....................................................................................................
DR13/Korea/JQ023162           ...................................................................................A................
DR13/Korea/JQ023161           ...................................................................................A................
GER/2014/LM645057             ...................................................................................A................
GER/2015/LT898435             ...................................................................................A................
GER/LT906582                  ....................................................................................................
France/2014/KR011756          ...................................................................................A................
Belgium/2015/KR003452         ...................................................................................A................
USA/2013/KF468752             ...................................................................................A................
IA1/USA/2013/KF468753         ...................................................................................A................
IA2/USA/2013/KF468754         ...................................................................................A................
USA/2013/KJ645704             ...................................................................................A................
USA/2013/KJ645635             ...................................................................................A................
USA/2013/KU893861             ...................................................................................A................
USA/2014/KJ645702             .....................................................T.............................A................
JPN/2013/LC063814             ...................................................................................A................
JPN/2014/LC063813             ........P..........................................................................A................
Korea/2001/MF737355           ...................................................................................A................
Korea/2013/KJ662670           ...................................................................................A................
Korea/2014/KR873431           ...................................................................................A................
Korea/2014/KM403155           ...................................................................................A................
Korea/2016/KY963963           ...................................................................................A................
JS2008/CN/KC109141            ...................................................................................A................
GD1/CN/2011/JX647847          .....................................................T.............................A................
GDA/CN/2012/JX112709          ......R..............................................T.............................A................
SDM/CN/2012/JX560761          ...................................................................................A................
CN/2014/KU252649              ...................................................................................A................
CN/2016/MF462814              ...................................................................................A................
CH hubei/CN/2016/KY928065     ...................................................................................A................
CN/2017/MF375374              ...................................................................................A................
CBR1/Thailand/2014/KR610993   ...................................................................................P................
KCHY/VN/2013/KJ960180         ...................................................................................A................
VAP/VN/2013/KJ960178          ...................................................................................P................
JFP/VN/2013/KJ960179          ...................................................................................P................
IBT/VN/2018                   ...................................................................................A................

                                        110       120       130       140       150       160       170       180       190       200
                              ....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|
CV777/Belgium/AF3353511       EGAKTEPTNLGVRKASEKPIIPKFSQQLPSVVEIVEPNTPPASRANSRSRSRGNGNNRSRSPSNNRGNNQSRGNSQNRGNNQGRGASQNRGGNNNNNNKS
CV777/CN/KT323979             ....................................................................................................
AJ1102/CN/JX188454            ...................................Q.....T.......M..................................................
SM98/Korea/GU937797           ....................T...............................................................................
DR13/Korea/JQ023162           ............................................T.......................................................
DR13/Korea/JQ023161           D.......................T................T..............I..T...D....................................
GER/2014/LM645057             ......................N..................T..........................................................
GER/2015/LT898435             ......................N..................T..........................................................
GER/LT906582                  ....................................................................................................
France/2014/KR011756          ......................N..................T..........................................................
Belgium/2015/KR003452         ......................N..................T...I......................................................
USA/2013/KF468752             ......................N..................T..........................................................
IA1/USA/2013/KF468753         ......................N..................T..........................................................
IA2/USA/2013/KF468754         ......................N..................T..........................................................
USA/2013/KJ645704             ......................N..................T..........................................................
USA/2013/KJ645635             ......................N..................T..........................................................
USA/2013/KU893861             ......................N..................T..........................................................
USA/2014/KJ645702             ......................N..................T..........................................................
JPN/2013/LC063814             ......................N..................T..........................................................
JPN/2014/LC063813             ......................N..................T..........................................................
Korea/2001/MF737355           ............................................T.......................................................
Korea/2013/KJ662670           ......................N..................T..........................................................
Korea/2014/KR873431           ......................N..................T..........................................................
Korea/2014/KM403155           ......................N..................T..........................................................
Korea/2016/KY963963           ......................N...H..............T............................................Y.............
JS2008/CN/KC109141            ............................................T.......................................................
GD1/CN/2011/JX647847          ...................................Q.....T.......M..................................................
GDA/CN/2012/JX112709          ...................................Q.....T.......M..................................................
SDM/CN/2012/JX560761          ............................................T....................G..................................
CN/2014/KU252649              ......................N..................T.........H................................................
CN/2016/MF462814              ......................N..................T..........................................................
CH hubei/CN/2016/KY928065     ..........V...........N..................T..........................................................
CN/2017/MF375374              ......................N..................T..........................................................
CBR1/Thailand/2014/KR610993   .........................................T...S......................................................
KCHY/VN/2013/KJ960180         .........................................T...S......................................................
VAP/VN/2013/KJ960178          .........................................T...S......................................................
JFP/VN/2013/KJ960179          .........................................T...S......................................................
IBT/VN/2018                   ......................N..................T..........................................................
```

```
                                       210       220       230       240       250       260       270       280       290       300
CV777/Belgium/AF3353511       RNQSNNRNQSNDRGGVTSRDDLVAAVKDALKSLGIGENPDRHKQQQKPKQEKSDNSGKNTPKKNKSRATSKERDLKDIPEWRRIPKGENSVAACFGPRGG
CV777/CN/KT323979             ....................................................................................................
AJ1102/CN/JX188454            ....K..........M.........................L...................N......................................
SM98/Korea/GU937797           ....................................................................................................
DR13/Korea/JQ023162           ....K..........M....................................................................................
DR13/Korea/JQ023161           ....KS...................................L..........................................................
GER/2014/LM645057             ....K...................................KL.........R..S.............................................
GER/2015/LT898435             ....K...................................KL.........RF.S.............................................
GER/LT906582                  ....................................................................................................
France/2014/KR011756          ....K...................................KL.........R..S.............................................
Belgium/2015/KR003452         ....K...................................KL.........R..S.............................................
USA/2013/KF468752             ....K...................................KL.........R..S.............................................
IA1/USA/2013/KF468753         ....K...................................KL.........R..S.............................................
IA2/USA/2013/KF468754         ....K...................................KL.........R..S.............................................
USA/2013/KJ645704             ....K...................................KL.........R..S.............................................
USA/2013/KJ645635             ....K...................................KL.........R..S.............................................
USA/2013/KU893861             ....K...................................KL.........R..S.............................................
USA/2014/KJ645702             ....K...................................KL.........R..S.............................................
JPN/2013/LC063814             ....K...................................KL.........R..S.............................................
JPN/2014/LC063813             ....K...................................KL.........R..S.............................................
Korea/2001/MF737355           ....K.S..................................L.........R..S.............................................
Korea/2013/KJ662670           ....K...................................KL.........R..S.............................................
Korea/2014/KR873431           ....K...................................KL.........R..S.............................................
Korea/2014/KM403155           ....K................................D..KL.........R..S.............................................
Korea/2016/KY963963           .H..K...................................KL.........R..S.............................................
JS2008/CN/KC109141            ....K..........M....................................................................................
GD1/CN/2011/JX647847          ....K..........M.........................L...................N......................................
GDA/CN/2012/JX112709          ....K..........M.........................L...................N......................................
SDM/CN/2012/JX560761          ....K..........M....................................................................................
CN/2014/KU252649              ....K...................................KL.........R..S.............................................
CN/2016/MF462814              ....K...................................KL.........R..S.............................................
CH hubei/CN/2016/KY928065     ....K..........M.........................L..........................................................
CN/2017/MF375374              ....K...................................KL.........R..S.............................................
CBR1/Thailand/2014/KR610993   ....K..........M.........................L.....L....................................................
KCHY/VN/2013/KJ960180         ....K..........M.........................L.....L....................................................
VAP/VN/2013/KJ960178          ....K..........M.........................L.....L....................................................
JFP/VN/2013/KJ960179          ....K..........M.........................L.....L....................................................
IBT/VN/2018                   ....K..........M.........................L..........................................................

                                       310       320       330       340       350       360       370       380       390       400
CV777/Belgium/AF3353511       FKNFGDAEFVEKGVDASGYAQIASLAPNVAALLFGGNVAVRELADSYEITYNYKMTVPKSDPNVELLVSQVDAFKTGNAKLQRKKEKKNKRETTLQQHEE
CV777/CN/KT323979             ....................................................................................................
AJ1102/CN/JX188454            ..............................................................................V.P.............Q.LN.D
SM98/Korea/GU937797           ....................................................................................................
DR13/Korea/JQ023162           ...............................................................................IP.............Q..N..
DR13/Korea/JQ023161           ................................................................................P......N......Q.LN..
GER/2014/LM645057             ................................................................................P.............Q.LN.D
GER/2015/LT898435             .....................................................V..........................P......N......Q.LN.D
GER/LT906582                  ....................................................................................................
France/2014/KR011756          .....................................................V..........................P.............Q.LN.D
Belgium/2015/KR003452         ................................................................................P.............Q.LN.D
USA/2013/KF468752             ................................................................................P.............Q.LN..
IA1/USA/2013/KF468753         ................................................................................P.............Q.LN..
IA2/USA/2013/KF468754         ............................................................Y...................P.............Q.LN..
USA/2013/KJ645704             ................................................................................P.............Q.LN..
USA/2013/KJ645635             ................................................................................P.............Q.LN..
USA/2013/KU893861             ................................................................................P.............Q.LN..
USA/2014/KJ645702             ................................................................................P.............Q.LN..
JPN/2013/LC063814             ................................................................................P.............Q.LN..
JPN/2014/LC063813             ................................................................................P.............Q.LN..
Korea/2001/MF737355           ................................................................................P.............Q.LN..
Korea/2013/KJ662670           ................................................................................P.............Q.LN..
Korea/2014/KR873431           ................................................................................P.............Q.LN..
Korea/2014/KM403155           ................................................................................P.............Q.LN..
Korea/2016/KY963963           ................................................................................P.............QRLN..
JS2008/CN/KC109141            ...............................................................................IP.............Q..N..
GD1/CN/2011/JX647847          ..............................................................................V.P.............Q.LN.D
GDA/CN/2012/JX112709          ..............................................................................I.P.............Q.LN.D
SDM/CN/2012/JX560761          ...............................................................................IP.............Q..N..
CN/2014/KU252649              ................................................................................P.............Q.LN.D
CN/2016/MF462814              ........L.......................................................................P.............Q.LN..
CH hubei/CN/2016/KY928065     ..........G.....................................................................P.............Q.LN.D
CN/2017/MF375374              ................................................................................P.............Q.LN.D
CBR1/Thailand/2014/KR610993   ...........RV..........................................I........................P.............Q.LN.D
KCHY/VN/2013/KJ960180         ...........RV..........................................I........................P.............Q.LN.D
VAP/VN/2013/KJ960178          ...........RV..........................................I........................P.............Q.LN.D
JFP/VN/2013/KJ960179          ...........RV..........................................I........................P.............Q.LN.D
IBT/VN/2018                   ...............................................................I.............S..P.............Q.LN.D
```

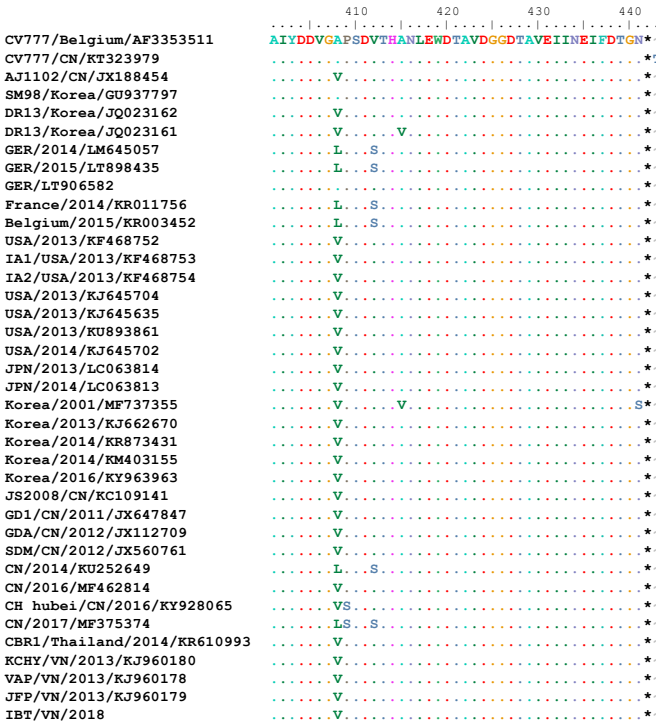

Figure S2. Comparison of amino acid sequences of N gene. The red arrow pointed the changes at aa positions ^{216}V > M^{216}, ^{400}E > D^{400} in PEDV-VN strains (IBT/VN/2018, KCHY, VAP, and JFP) and some of PEDV strains (from China and Thailand) compared to CV777/AF353511 strain. The green arrow pointed the changes at aa positions ^{364}V > I^{364} and ^{378}N > S^{378} between IBT/VN/2018 strain and other strains.