Design a diagnostic kit for SARS-CoV-2

Our class was assigned by Dr. Mason, the College Chancellor, to design the Penn State Harrisburg in-house kit for detection of the SARS-CoV-2. Based on the material covered in class, you need to design a primer set and a TaqMan(R) probe specific to the viral nucleocapsid phosphoprotein. You will use the virus isolated by a patient in Seattle, with the GenBank accession number MT020880.1.

The table of genomic features for the virus is seen here: MT020880.1 genbank table.txt. You can consult the formal CDC guidelines, as seen in this document: 2019-nCoV qPCR.pdf.

To ensure that your test is specific, you will need to demonstrate that it will give a negative result when tested with the SARS Coronavirus, with GenBank accession number GU553364.

You will have to report:

1. the sequences of your primers,
2. the positions of the primers in the viral genome,
3. the size of the amplicon,
4. the sequence of the probe,
5. the position of the probe when hybridized with the viral genome,
6. the annealing temperature for the qPCR assay,
7. the specificity as indicated by negative outcome of a qPCR with the SARS Coronavirus.