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(40, 41). Coronavirus genomes and subgenomes encode six ORFs (31). The majority of the 5’ end is occupied by ORFla/b, which produces 16 nsps. The two polyproteins, ppla and pplab, are initially produced from ORFla/b by a —1 frameshift between ORFla and ORF 1b (32). The virus-encoded proteases cleave polyproteins into individual nsps (main protease [Mpro], chymotrypsin-like protease [3CLpro], and papain-like proteases [PLPs]) (42). SARS-CoV-2 also encodes these nsps, and their functions have been elucidated recently (31). Remarkably, a difference between SARS-CoV-2 and other CoVs is the identification of a novel short putative protein within the ORF3 band, a secreted protein with an alpha helix and beta-sheet with six strands encoded by ORF8 (31). Coronaviruses encode four major structural proteins, namely, spike (S), membrane (M), envelope (E), and nucleocapsid (N), which are described in detail below. S Glycoprotein Coronavirus S protein is a large, multifunctional class I viral transmembrane protein. The size of this