

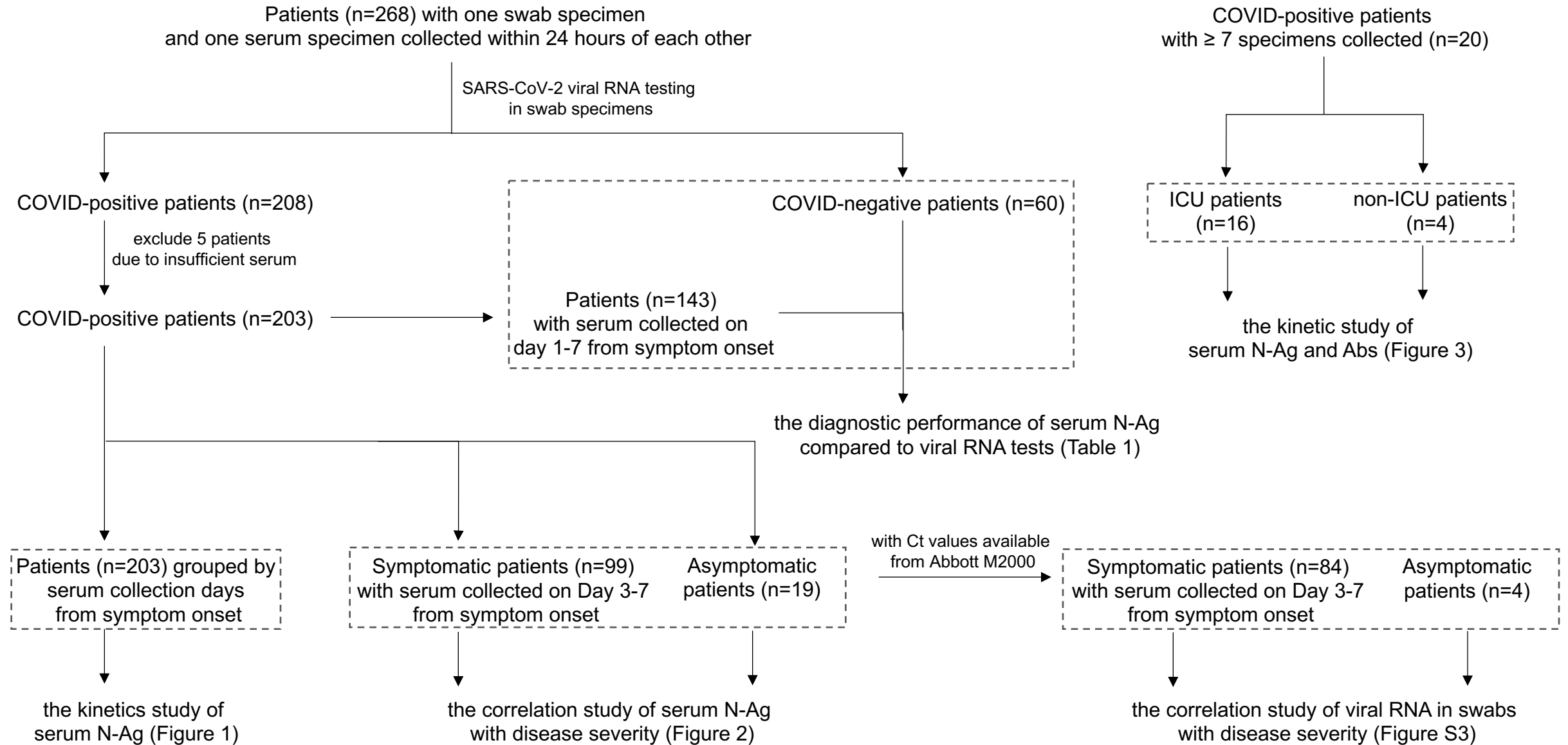
Supplemental Table 1. The kinetics and diagnostic sensitivity of serum N-Ag by days from symptom onset.

From Symptom onset	Samples (n)	Median (pg/mL)	IQR 25–75% (pg/mL)	TP (n)	FN (n)	Sensitivity (%)
NA*	26	1	1-167	11	15	42.3
Day 1	22	18	1-211	15	7	68.2
Day 2	22	116	30-2015	19	3	86.4
Day 3	25	1038	59-3115	24	1	96.0
Day 4	22	3520	1228-6741	21	1	95.5
Day 5	17	1905	27-7091	17	0	100.0
Day 6	8	5102	1875-10707	8	0	100.0
Day 7	27	1731	680-9881	26	1	96.3
Day 8-14	27	437	31-3416	23	4	85.2
Day 15-21	7	144	1-13694	4	3	57.1

n, case number; IQR, interquartile range; TP, True positive; FN, false negative.

* NA indicates the information of day from symptom onset was not available since cases were asymptomatic at the time of sample collection.

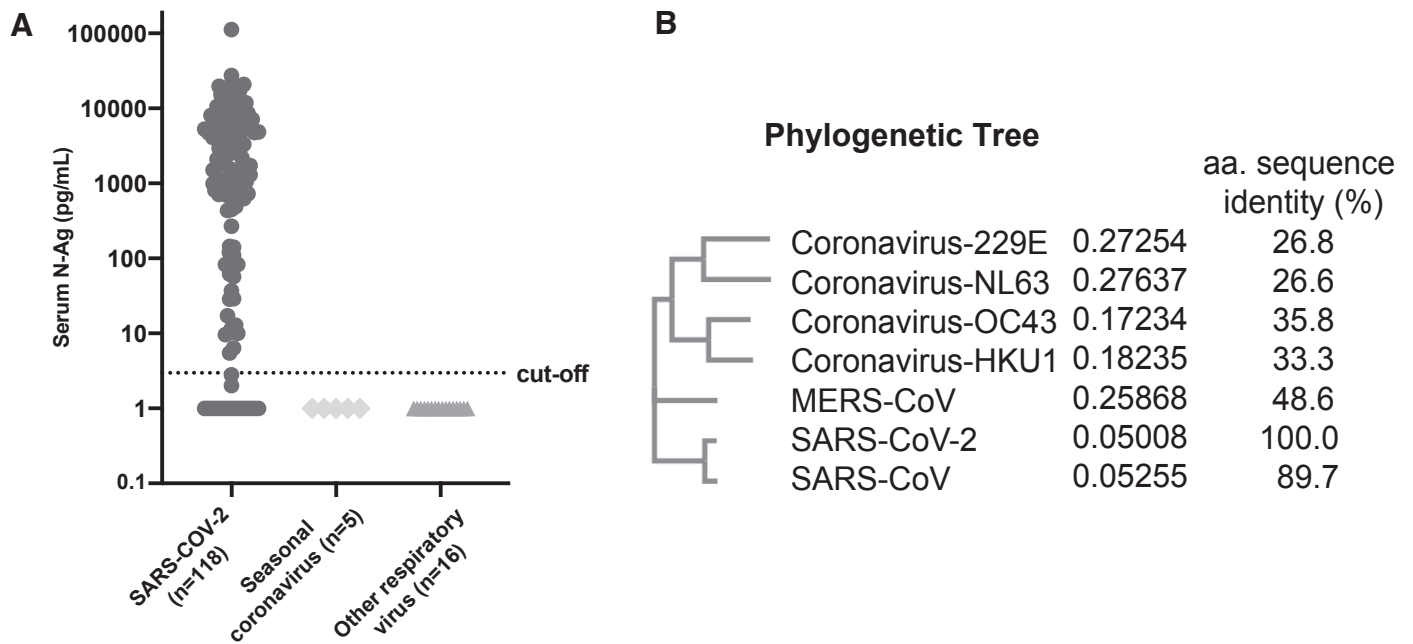
Supplemental Fig. 1. Cross-sectional studies



Supplemental Fig. 1. A, flowchart diagram of patient and specimen inclusion criteria for cross-sectional and longitudinal studies. The dotted squares indicate cases pooled for different studies.

Supplemental Fig. 2.

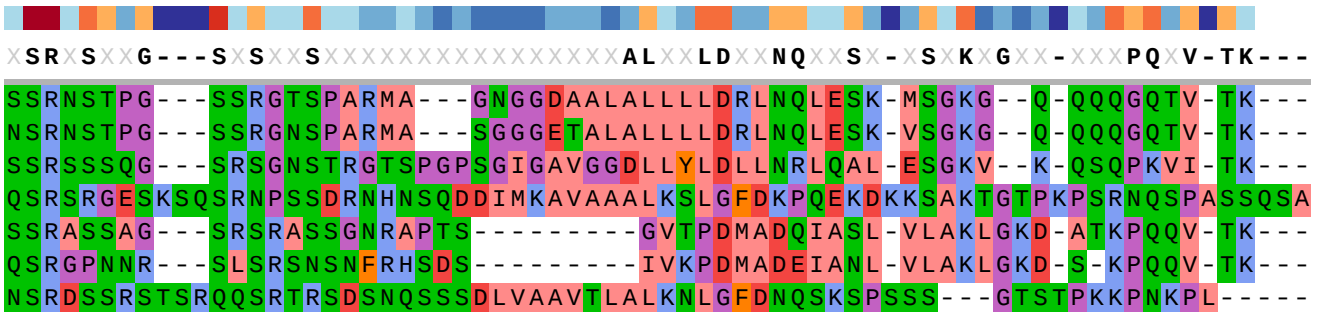
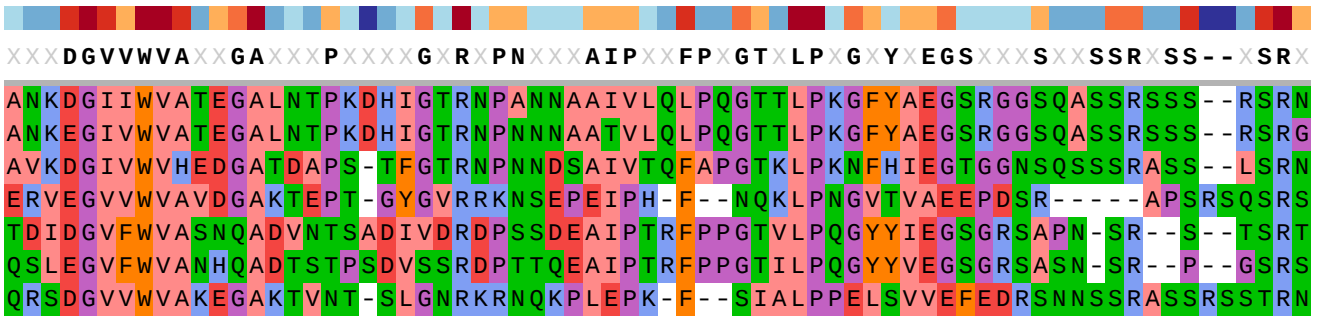
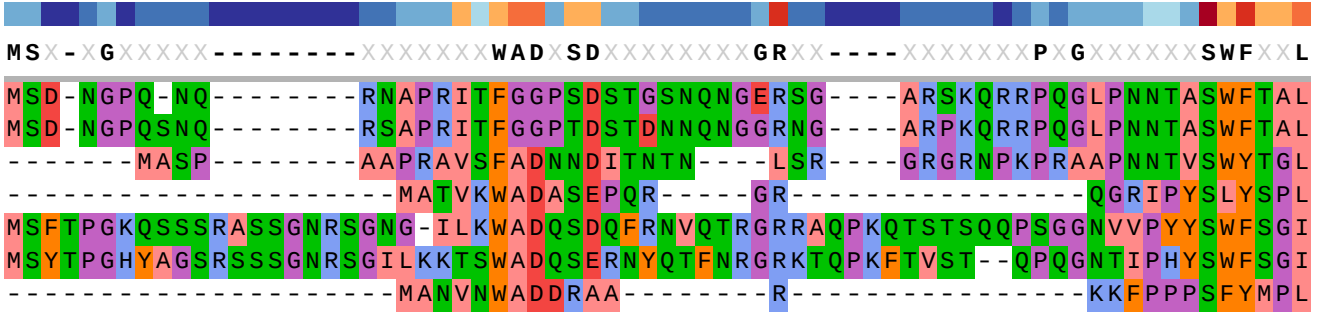
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Supplemental Fig. 2. A, Serum N-Ag concentrations observed in cases infected with SARS-CoV-2 (N=118), seasonal coronavirus (N=5), and other respiratory virus (N=16). SARS-CoV-2 cases include 99 symptomatic cases on day 3-7 from symptom onset and 19 asymptomatic cases. Seasonal coronavirus includes 229E, OC43, and HKU1; other respiratory virus includes human rhinovirus /enterovirus, metapneumovirus, respiratory syncytial virus, parainfluenza type 1 virus, and adenovirus. Any Ag concentration under 1 pg/mL, lower than limit of blank (1.08 pg/mL), was transferred to 1pg/ml for the data representation on the log-scale. **B**, The amino acid (aa.) sequence similarity of N proteins within the coronavirus family.

Consensus

- 1. SARS-CoV-2_N protein
- 2. SARS-CoV_N protein
- 3. MERS_N protein
- 4. 229E_N protein
- 5. OC43_N protein
- 6. HKU1_N protein
- 7. NL63_N protein



-----XXAXXXXXXXXXXKPRQKRTPTKX--XNVXQCFGXRGPXQ---NFGDXXLXXXGTXXKXXPQX

1	-----KSAA-----EASKKPRQKRATKA--YNTQAFGRRGPEQTQGNFGDQELIRQGTDYKHWPQI	304
2	-----KSAA-----EASKKPRQKRATKQ--YNTQAFGRRGPEQTQGNFGDQDLIRQGTDYKHWPQI	305
3	-----KDAA-----AAKNKMRHKRTSTKS--FMVQAFGLRGPGLQGNFGDLQLNKLGTEDPRWPQI	296
4	AKILARSQSSEETKEQKHEMQKPRWKRQPNDDVTSNVTQCFGPRDLDH---NFGSAGVVANGVKAKGYPQF	292
5	-----HTAKEVRQKILNKPRQKRSPNKQ--CTVQQCFGKRGPNQ---NFGGEMLKLGTSDPQFPIL	313
6	-----QNAKEIRHKILTKPRQKRTPNKH--CNVQQCFGKRGPSQ---NFGNAEMLKLGTNDPQFPIL	311
7	-----SQPRADKPSQLKKPRWKRVPTRERE--ENVIQCFGPRDFNH---NMGSDLVQNGVDAKGFPQL	277

AELAPXAXAFFXSXXXXXXXXX-----XXXXLTYXGAIXXDXXXPXFXXXXXXXXLXXXXDAYXXX

1	AQFAPSASAFFGMSRIGMEVTP-----SGTWLTYTGAIKLDKDPNFKDQVILLNKHIDAYKTF	363
2	AQFAPSASAFFGMSRIGMEVTP-----SGTWLTYHGAIKLDKDPQFKDNVILLNKHIDAYKTF	364
3	AELAPTASAFMGMSQFKLTHQN-----NDDHGNPVYFLRYSGAIKLDKPNPNYKWLLELEQNIDAYKTF	361
4	AELVPSTAAMLFDSHIVSKESG-----NTVVLTFTRVTVPKDHPLGKFLLEEL-----NAFTRE	347
5	AELAPTAGAFFFGSRLELAKVQNLSGNPDEPQKDVYELRYNGAIRFDSTLSGFETIMKVLNENLNAYQQQ	383
6	AELAPTPGAFFFGSKLELVKRE---SEADSPVKDVFELRYSGSIRFDSTLPGFETIMKVLKENLDAYVNS	378
7	AELIPNQAALFFDSEVSTDEVG-----DNVQITYTYKMLVAKDNKNLPKFIEQI-----SAFTKP	332

XXXX-----X--XXXXXPQRQXXXX-----XXXXXXXXXXXXXXXXXPP-----XXXXXXXXDXXXEXXXLXXXXXXXX

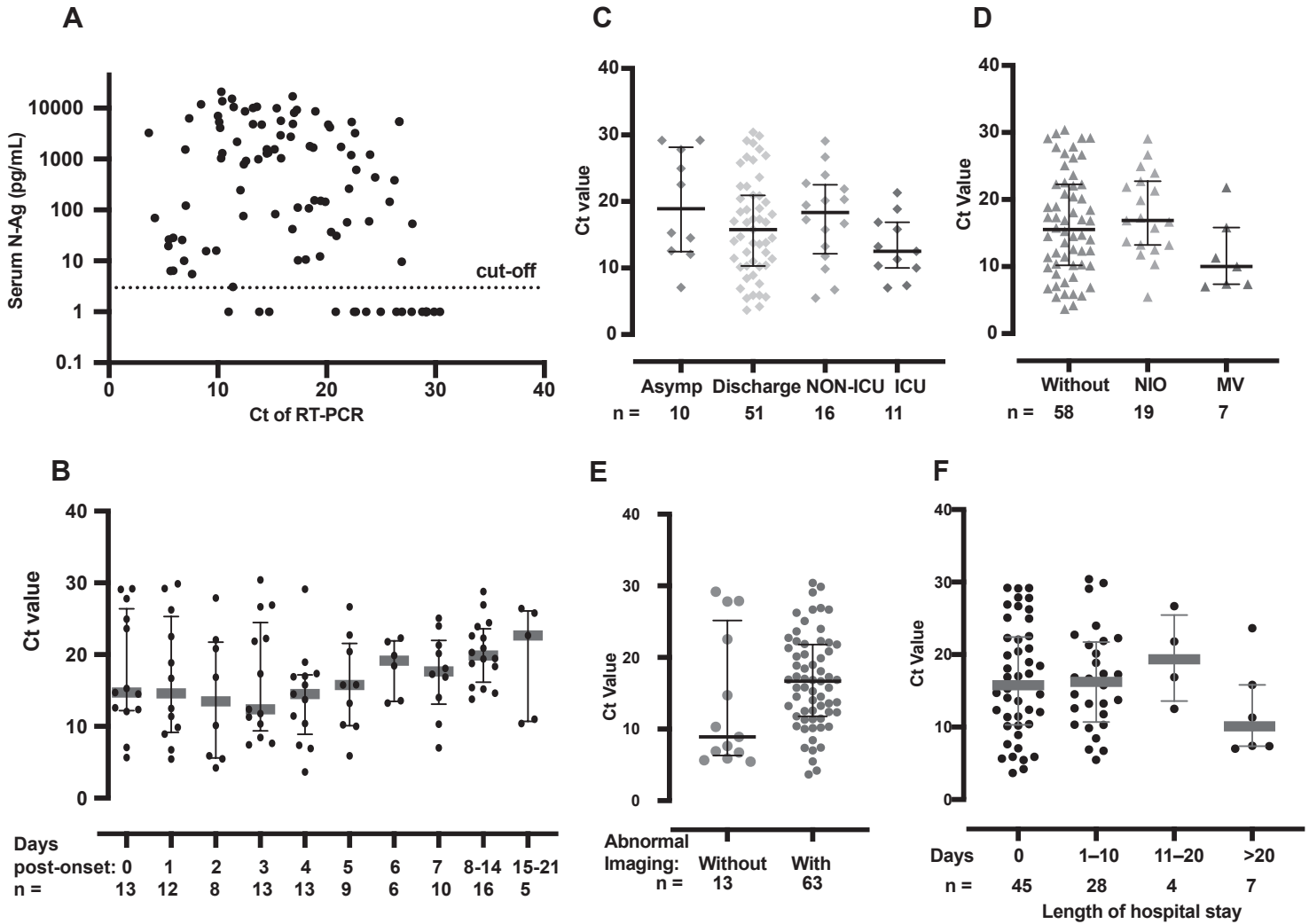
1	PPTEPKKDKKKKAD--ETQALPQRQ-----KKQQTVTLLP-----AADLDDFSKQLQQSMSS	413
2	PPTEPKKDKKKKTD--EAQPLPQRQ-----KKQPTVTLLP-----AADMDDFSRQLQNSMSG	414
3	PKKEKKQKAPKEESTDQMSSEPPKEQRVQGSITQRTTRRPSVQGP-----MIDVNTD-----	413
4	MQ-----QQPLLNPSELEFNP--SQTSPATVEP--VRDEVSIEDIIDEVN-----	389
5	DG-----MMNMSPKPQRQRGLK--NGQGENDNISVASPKSRVQQNKSRELTAEDISLLKMDDE	439
6	NQNT-----VSGSLSPKPRKRGVK--QSPELLDPLNLSA---DTQHISNDFTPEDHSLLATLDD	433
7	SS-----IKEMQSQSSHVVQNTVLNASIPESKP--LADDDSAIIEIVNEVLH-----	377

XXXXXX--

1	ADSTQA--	419
2	ASADSTQA	422
3	-----	413
4	-----	389
5	PYTEDTSE	447
6	PYVEDSVA	441
7	-----	377

Supplemental Fig. 3.

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Supplemental Fig.3. **A**, No significant correlation between N-Ag concentrations in serum and Ct values of RT-PCR in NP swabs. Each dot indicates one case, for which serum and NP swab samples were collected within 24 hrs. Cut-off was set at 2.97 pg/mL. Any Ag concentration under 1 pg/mL, lower than limit of blank (1.08 pg/mL), was transferred to 1 pg/mL for data representation on the log-scale. **B**, Ct value by days after symptom onset. Each dot indicates Ct value of RT-PCR which evaluated viral RNA in a NP swab sample and were grouped by swab collection days from symptom onset, and each red line indicates the mean value in each time-period group. **C-F**, No significant correlation of Ct Values of RT-PCR with disease severity: **C**, in cases with different highest level of outcomes, including asymptomatic (Asymp), symptomatic but discharged (discharged), hospitalized-to-non-ICU (NON-ICU), and hospitalized-to-ICU (ICU); **D**, in cases without medical interventions, with non-invasive oxygenation (NIO), or with mechanical ventilation (MV); **E**, in cases without or with chest abnormal findings; and **F** in cases with different length of hospital stay, including 0, 1-10, 11-20, and > 20 days. All swab samples were collected during day 0-7 from symptom onset. The case number (n) is indicated under each group.