Supplementary Information:

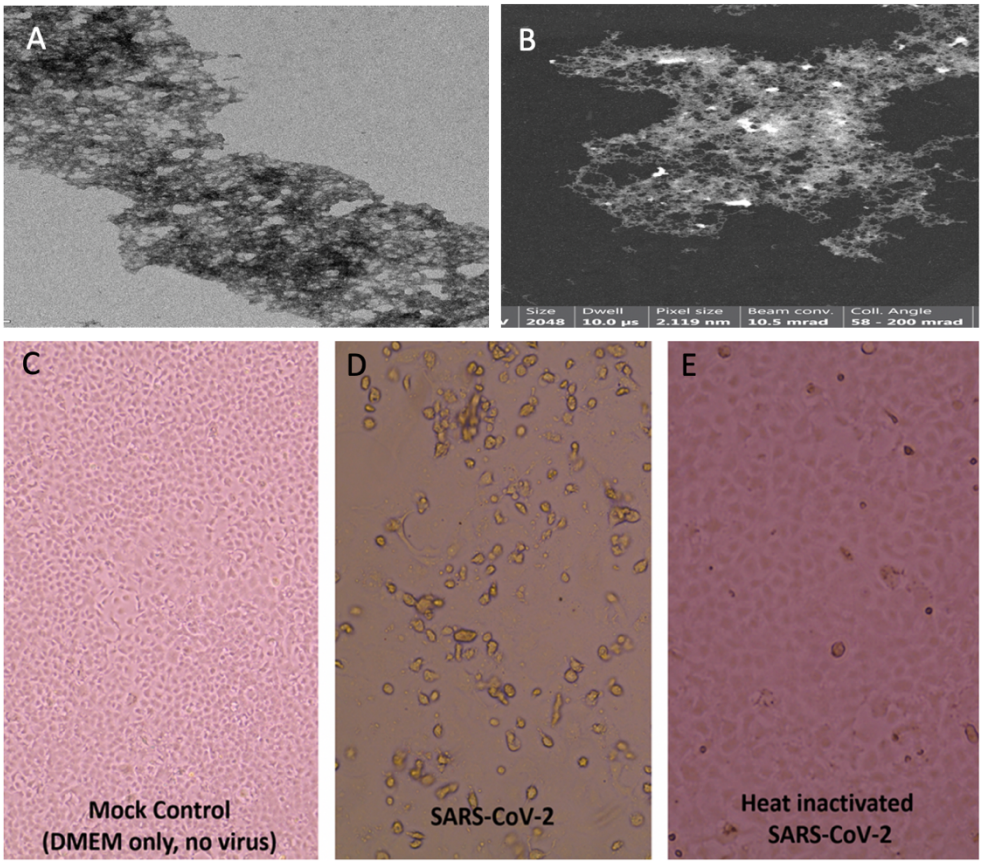

Figure S1. A, B) Selected S/TEM images of drops of diluted Bacteriophage MS2 samples analyzed to find the MS2 particles in aggregates. Imaged using Spirit 120 kV TEM and Talos F200X 200 kV TEM respectively. Optical microscopy Images C) Cytopathic effect in Vero E6 cells after inoculation with Mock. D) SARS-CoV-2 virus. E) Heat inactivated SARS-CoV-2, no CPE detected after 7 days indicates no remaining viral activity and samples can then be removed from the BSL3

Descriptions | Graphic Summary | Alignments | Taxonomy

Sequences producing significant alignments Download | New Select columns | Show 100

select all *100 sequences selected* GenBank | Graphics | Distance tree of results | New MSA Viewer

Description	Scientific Name	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2511/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267426.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2967/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267425.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2958/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267423.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2978/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267420.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2528/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267419.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2472/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267417.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2484/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267415.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2512/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267414.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2478/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267413.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2488/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267412.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2479/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267411.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2521/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267410.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2517/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267409.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2476/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267408.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2487/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267403.1
Severe acute respiratory syndrome coronavirus 2 isolate hCoV-19/Switzerland/VD-CHUV-GEN2471/2020 geno...	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OU267398.1
Severe acute respiratory syndrome coronavirus 2 genome assembly, complete genome: monopartite	Severe acute res...	54983	54983	99%	0.0	99.99%	29903	OA967097.1
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Severe acute respiratory syndrome coronavirus 2 isolate Switzerland/GE-SNRCI-8301/2020 genome assembly,...	Severe acute res...	54983	54983	99%	0.0	99.99%	29836	FR993513.1
Severe acute respiratory syndrome coronavirus 2 isolate Switzerland/GE-SNRCI-9136/2020 genome assembly,...	Severe acute res...	54983	54983	99%	0.0	99.99%	29834	FR993438.1

Figure S2. BLASTN, using the betacornavirus genomic database, result of the sequence genome of the SARS-CoV-2 sample. GenBank ID for the sequence is MN908947.3.

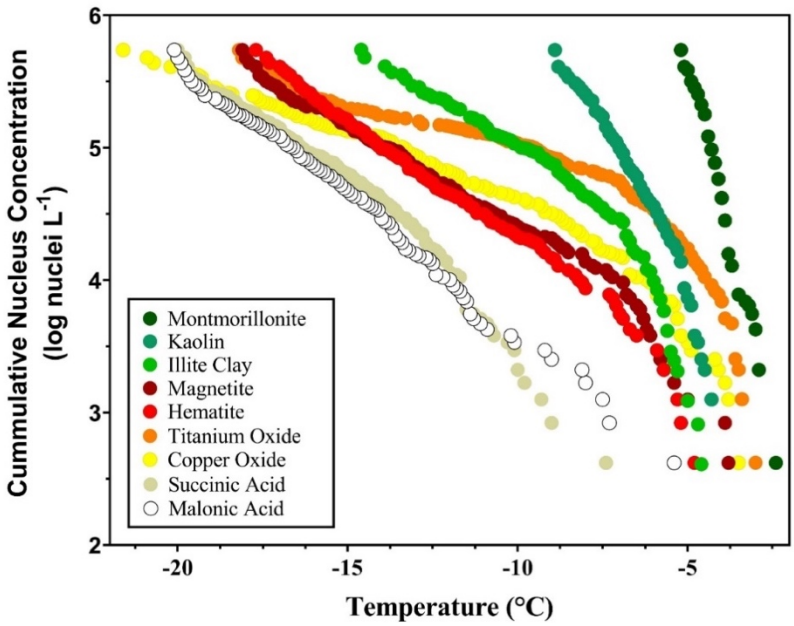

Figure S3. Cumulative ice nucleus concentrations for selected airborne contaminants.

Figure S4. Cumulative ice nucleus concentrations for TiO_2, Fe_2O_3, and CuO compared to the Milli-Q reference.

Figure S5. Distribution of freezing temperatures among different MS2 samples.
† Centrifuged.

Figure S6. Intensity-weighted size distribution vs. particle diameters for MS2 samples at various dilution factors. Data was obtained from the Litesizer particle sizer 500 (Anton Paar).

Figure S7. Intensity vs. wavelength of the UVA lamp used in experiments (2 trials).

Table S1. Statistical values calculated from freezing points observed during drop freezing experiments of various MS2 Bacteriophage, SARS-CoV-1 and SARS-CoV-2, water samples and solutions containing other common INPs found in air.

Statistic ($^{\circ}C$)	Mean	Median	1st Percentile	99th Percentile	Standard Error ($\sigma/\sqrt{N}$)
References/blank					
Milli-Q Water	-20.5	-21.3	-22.9	-16.8	0.17
Viral RNA					
MS2 RNA	-13.9	-14.6	-19.9	-4.0	0.283
MS2 RNA + Copper Oxide	-11.7	-11.1	-21.7	-5.0	0.269
MS2 RNA + Titanium Oxide	-12.4	-11.2	-19.8	-3.7	0.581
Influenza RNA	-13.7	-14.1	-22.2	-3.9	0.285
SARS-Cov-1 RNA	-13.7	-14.2	-18.3	-5.2	0.259
SARS-CoV-1 RNA, Centrifuged	-16.1	-17.2	-18.5	-6.7	0.251
SARS-Cov-1 RNA, Filtered	-14.0	-14.7	-18.9	-4.1	0.32
SARS-CoV-2 RNA	-15.9	-16.5	-25.3	-4.5	0.415
SARS CoV-2 RNA, Centrifuged	-17.6	-19.3	-23.5	-5.6	0.377
SARS CoV-2 RNA, Filtered	-19.9	-20.4	-23.1	-13.3	0.287
MS2 Bacteriophage					
MS2 100 X	-16.5	-16.9	-20.1	-9.61	0.3
MS2 200 X	-18.8	-19.8	-21.6	-7.69	0.3
MS2 330 X	-18.2	-19.5	-21.5	-9.76	0.3
MS2, UVA	-13.3	-14.9	-19.1	-4.3	0.366
MS2, UVB	-12.6	-14.3	-18.5	-4.2	0.325
MS2 + Iron (III) Oxide	-14.4	-15.4	-19.9	-5.1	0.2
MS2 + Copper Oxide*	-10.7	-8.1	-21.5	-3.9	0.522
MS2 + Titanium Oxide*	-12.7	-13.1	-19.6	-4.7	0.36
SARS CoV-2 and Proteins					
Heat Inactive SARS CoV-2	-17.6	-18.4	-23.1	-12.5	0.18
Heat Inactive SARS CoV-2 Centrifuged	-18.9	-19.3	-24.2	-8.2	0.231
Heat Inactive SARS CoV-2 Filtered	-16.8	-17.0	-21.1	-10.2	0.173
Anti SARS	-16.8	-17.7	-22.9	-6.4	0.297
Other Airborne Materials					
Kaolin*	-6.6	-6.8	-8.9	-2.9	0.068
Montmorillonite*	-4.2	-4.2	-5.2	-5.1	0.03
Illite Clay*	-9.1	-8.9	-14.5	-5.5	0.15
Iron (III) oxide*	-12.6	-13.3	-17.4	-5.2	0.186
Iron (II, III) oxide*	-12.5	-13.0	-18.0	-7.7	0.211
Malonic Acid*	-15.6	-15.9	-20.0	-9.5	0.171
Succinic Acid*	-15.2	-15.3	-19.8	-3.4	0.163
Titanium (IV) Oxide*	-9.1	-8.1	-18.0	-3.8	0.264
Copper (II) Oxide*	-12.1	-12.4	-20.8	-3.8	0.271