

# Summary of Verification Test

Evaluation of the inactivation efficacy of gaseous Chlorine Dioxide  
for Influenza A virus and SARS-CoV-2

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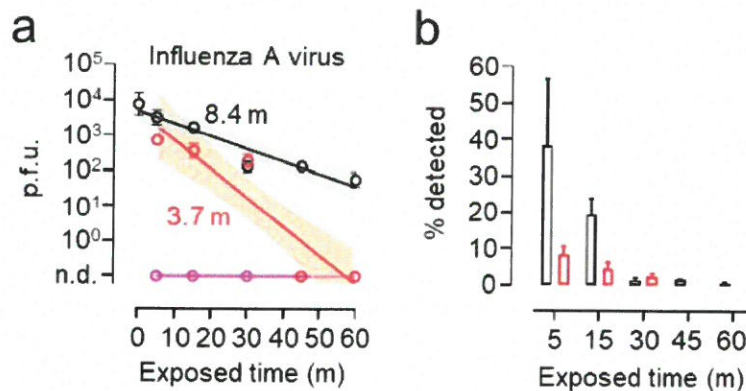
## Summary of Test Result

**Conducting Test:** We've executed inactivation efficacy test of gaseous Chlorine Dioxide disinfectant (Dr Clo) manufactured by NON Corporation for Influenza Virus and SARS-CoV-2. To do that, after 16 hours later from the time of activation of 1 Chlorine Dioxide disinfectant stick (herein after "Dr Clo"), we attached Dr Clo to the top inside of Air-tight chamber (0.015625 m<sup>3</sup>), and sealed up the chamber. Then, we sprayed viruses inside the chamber immediately, and also sprayed viruses after 1 hour. After spraying viruses, we collected viruses inside chamber by air-scanner at different time; after 5 minutes, 15 minutes, 30 minutes, 45 minutes, and 60 minutes. Then, we measured virus titer by undertaking cultivation test (plaque-forming assay) for those collected influenza A or SARS-CoV-2.

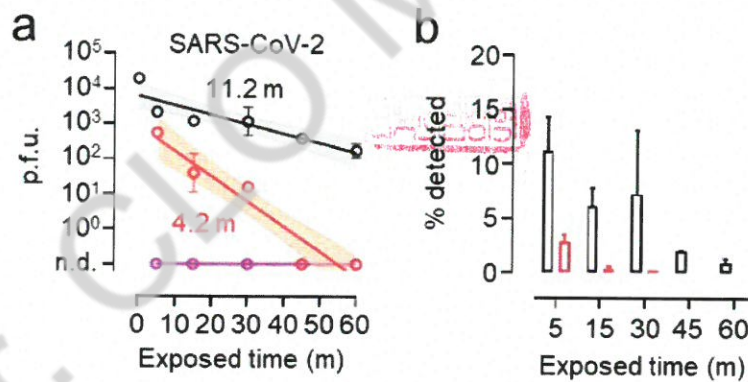
### Test Result:

1. Inhibition Efficacy toward Infectivity of Influenza virus. Without Dr Clo inside the chamber, after spraying Influenza A virus, we collected and cultivated virus from the chamber after (8,810 ± 5,897 p.f.u./chamber, mean ± S.D., 0 minute), 5 minutes, 15 minutes, 30 minutes, 45 minutes, and 60 minutes. Then we detected virus with p.f.u./chamber infectivity, 3,382 ± 1,609 (62% decreased), 1,730 ± 382 (80% decreased), 135 ± 49 (98% decreased), 137 ± 25 (98% decreased), 60 ± 28 (99% decreased) by the time respectively. Whereas with Dr Clo activated, and spray the virus immediately inside the chamber, we detected virus with p.f.u./chamber infectivity after 5 minutes, 15 minutes and 30 minutes, and got the result of 740 ± 198 (92% decreased), 386 ± 178 (96% decreased), 198 ± 87 (98% decreased) respectively, and after 1 hour, there is no infective virus detected (picture 1). When we sprayed virus after 1 hour from the time Dr Clo activated inside the chamber, there are no infective viruses detected after 5 minutes, 15 minutes, 30 minutes, 45 minutes, and 60 minutes. When we calculated 50% reduction time for infective influenza virus by liner regression analysis, without Dr Clo it took 8.4 minutes, while with Dr Clo (immediate virus spray), it took 3.7 minutes which, we confirmed, almost 2 times faster to reduce infective virus (picture 1a).

2. Inhibition Efficacy toward SARS-CoV-2. Without Dr Clo inside the chamber, after spraying SARS-CoV-2, we collected and cultivated virus from the chamber after (19,660 ± 5,897 p.f.u./chamber, mean ± S.D., 0 minute), 5 minutes, 15 minutes, 30 minutes, 45 minutes, and 60 minutes. Then we detected virus with p.f.u./chamber infectivity, 2,200 ± 622 (75% decreased), 1,216 ± 317 (86% decreased), 1,428 ± 1,160 (84% decreased), 384 ± 23 (96% decreased), 184 ± 79 (98% decreased) by the time respectively. Whereas with Dr Clo activated, and spray the virus immediately inside the chamber, we detected virus with p.f.u./chamber infectivity, after 5 minutes, 15 minutes and 30 minutes, and got the result of, 560 ± 113 (94% decreased), 56 ± 57 (99% decreased), 16 ± 0 (99.8% decreased), and after 1 hour, there is no infective virus detected (picture 2). When we sprayed virus after 1 hour from the time Dr Clo activated inside the chamber, there are no infective viruses detected after 5 minutes, 15 minutes, 30 minutes, 45 minutes, and 60 minutes. When we calculated 50% reduction time for SARS-CoV-2 virus by liner regression analysis, without Dr Clo it took 11.2 minutes, while with Dr Clo (immediate virus spray), it took 4.2 minutes which, we confirmed, almost 2.5 times faster to reduce infective virus (picture 2a).



Picture 1. Changes of infective influenza (Influenza A virus H1N1) sprayed into the chamber as stated in “Conducting Test” (Black: Control group without Dr Clo, Red: Experimental group, to spray virus into the chamber with simultaneous installation of Dr Clo which was already activated for 16 hour, and collect the virus by time, Purple: Experimental group, to install Dr Clo, activated for 16 hours, into the chamber, then spray the viruses after 1 hour) a. Liner regression analysis for Changes of Infectivity (shade: 95% confidence interval). Time: 50% reduction time for infectivity (m: minute). b. Comparison remaining virus between Control group and Experimental group. p.f.u: plaque-forming unit, n.d: not detected.



Picture 2. Changes of COVID-19 Virus (SARS-CoV-2) sprayed into the chamber as stated in “Conducting Test” (Black: Control group without Dr Clo, Red: Experimental group, to spray virus into the chamber with simultaneous installation of Dr Clo which was already activated for 16 hour, and collect the virus by time, Purple: Experimental group, to install Dr Clo, activated for 16 hours, into the chamber, then spray the viruses after 1 hour) a. Liner regression analysis for Changes of Infectivity (shade: 95% confidence interval). Time: 50% reduction time for infectivity (m: minute). b. Comparison remaining virus between Control group and Experimental group. p.f.u: plaque-forming unit, n.d: not detected.