HygenX Vray UVC Sanitizer Efficacy Test Against COVID-19 Coronavirus

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Research objectives

Research on the control effect of COVID-19 by the Vray UVC lamp device

Purpose of the Test

- Multiple studies conducted have proven the efficacy of virus extinction by light energy of various wavelengths.
- This study is conducted to verify the use of Hygenx Vray UVC lamp device in destroying Covid-19 Coronavirus.

Research Contents and Methods

- 1. Virus acquisition
 - SARS-CoV-2 (NCCP 43326) was distributed by the National Culture Collection for Pathogens (NCCP) of the Korea Disease Control and Prevention Agency (KDCA)
- 2. Cell Culture (BL2 Facility)
 - (The day before infection)
 - Vero E6 cells were seeded on 96 well cell culture plate at the concentration of $2x10^4$ /well in the BL2 facility
 - For cell culture, DMEM media containing 2% Fetal Bovine Serum were used
 - They were incubated in the CO_2 incubator under conditions of 37°C and 5% CO_2
- 3. UVC lamp irradiation (BL3 facility) (The day of infection)
- 4. Prepared cells, and Vray with the UVC lamp requested to PRIMETECH Co., Ltd./Hamilton-Buhl were brought into the BL3
- 5. 100μ1 of virus + 0.9ml of culture medium (DMEM containing 2% Fetal Bovine Serum) was mixed into a cell culture dish in the biological safety cabinet (BSC)
- 6. Irradiation was conducted at different distances and times, as shown in Table 1
- 100µl of the reaction solution was conducted six times serial dilution into the 96 well cell culture plate which Vero E6 cells were incubated
- 8. Positive control group was not irradiated the UVC lamp
- Culture and cytopathic effect (CPE) were observed for two to five days under conditions of 37°C and 5% CO2 in the CO₂ incubator



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Table 1. UVC larnp irradiation conditions

Irradiation Distance	Vray / 5cm (1.97") distance	Vray held by VClaw / 20cm (7.87") distance
Irradiation Time	5 seconds	5 seconds
	10 seconds	10 seconds
	30 seconds	30 seconds



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Research Results

Virus Initial Concentration Irradiation Distance	3.16x10 ⁷ TCID ₅₀ /ml				
	Vray / 5cm (1.97") distance		Vray held by VClaw / 20cm (7.87") distance		
Irradiation Time		over 99.99% inactivated	5 seconds	over 98.531% inactivated	
	10 seconds	over 99.99% inactivated	10 seconds	over 99.853% inactivated	
	30 seconds	over 99.99% inactivated	30 seconds	over 99.99% inactivated	



Photo results of virus-infected cell

Distance Time	5 seconds	10 seconds	30 seconds
5cm (1.97") (Vray)			
	over 99.99% inactivated	over 99.99% inactivated	over 99.99% inactivated
20cm (7.87") (Vray held by V-Claw)	over 99.531% inactivated	over 99.853% inactivated	over 99.99% inactivated