

## The Potential Role for the Application of UV Germicidal Illumination to Destroy Airborne COVID-19 Particles

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Quotation: “UV based Germicidal Irradiation could be utilized as an effective way to deal with airborne COVID-19 viral particles during the current worldwide pandemic”.

Coronavirus COVID-19 is a respiratory infection that is spread from person to person by respiratory droplets during periods of coughing, sneezing or by spray generated during oral communication [1].

Pathak noted that respiratory droplets can quite frequently hold copious amounts of COVID-19 viral particles [2]. This investigator pointed out that the droplet size is large, and can only remain in the air for a matter of seconds [2]. This is the reason why it has been established that a distance of 6 feet or 2 metres should be maintained between individuals [2]. This is also an important rationale for individuals to wear masks [2]. Dr Pathak also mentions that another way that airborne viral infections can be spread is via the residues derived from “evaporated droplets or dust particles” [2].

In a more recent article in the “International Business Times” of 18 May 2020, Villansanta reported that in lab based experiments it was found that COVID-19 viral particles had the ability to remain suspended for a period of thirty minutes [3]. It was further noted in this same experimental study that COVID-19 was also found to remain viable in an aerosol state for a period of about three hours [3].

Italian investigators in Bergamo province discovered the presence of COVID-19 virus on air pollution particles [4]. These investigators noted that with this new finding involving the association of COVID-19 with air pollution particles there is yet another way that these viral particles could be spread over further distances [4].

As many areas of the world start to reopen places where people gather, an important question arises, namely, how can airborne COVID-19 viral particles be decreased or totally destroyed.

This need must be addressed for application in places of business, government offices, schools, hospitals, courtrooms, and places of large gatherings such as houses of worship, cinemas, restaurants, bars, barbershops, beauty salons, bowling alleys and in the houses of the state and federal legislature.

In the past Ultraviolet or UV Illumination has been utilized to “kill or inactivate” microbial pathogens [5]. The way that UV functions as a germicidal agent is that it is able to bring about deactivation of microbial life. Short UV light has the ability to destroy nucleic acids and thus by doing so, brings about a disruption of the DNA of these microbial organisms [5]. The end result is that these microbial agents no longer have the capacity to carry out “vital cellular functions” [5].

Ultraviolet irradiation has been utilized to disinfect air over an extended period of time [5]. In experimental studies that were conducted in the Philadelphia Public School back in the decades of the 1930's and 1940's, classrooms were fitted with "upper room UV fixtures [5]. It was noted that in those classrooms where these upper room UV fixtures were installed, there occurred a corresponding reduction in the number cases of measles virus transmission among students in that classroom [5].

The research investigation of Welch, *et al.* found that when "far UVC" irradiation was utilized with wavelengths of 207 to 222nm, there successfully occurred an inactivation of bacterial activity, Wavelengths of 207 to 222nm had the additional advantage of not causing harm to the skin of mammals exposed to such UV illumination [6]. An important finding derived from this investigation was that far-UVC can effectively inactivate airborne aerosolized viruses such as the H1N1 influenza virus [6]. The overall conclusion of these investigators was that this type of "continuous very low dose-rate far-UVC light" could be utilized in indoor locations as a useful, safe and inexpensive, system that was able lessen the spread of airborne infections [6].

The findings of these earlier studies involving the application of UV Germicidal Illumination are currently being reviewed by public health authorities. UV based Germicidal Irradiation could be utilized as an effective way to deal with airborne COVID-19 viral particles during the current worldwide pandemic [5,6].

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