

# THE SOCIAL ANTIVIRAL SYSTEM

## The Pandemic Killer

(Wash Your Personal Space Initiative)

U.S. Patent Application 16/993,066

U.S. Patent Application 17/073,394

PCT/US21/31528

Kambiz Behzadi, Author  
Behzadi Medical Device LLC  
2467 Via De Los Milagros  
Pleasanton, CA 94566  
kbehzadi@comcast.net

### **Abstract:**

*It is well known that natural electromagnetic phenomena can be harmful to both humans and microbes. These phenomena, however, can be titrated to lower doses to be harmful to microbes and viruses while remaining safe to humans. An example of this concept is the use of far UVC light (222nm) at low doses of 2mJ/cm, which is harmful to the H1N1 and Influenza viruses but safe to human eye and skin cells. We can achieve a “virus kill human safe” (VKHS) dosage of many natural electromagnetic phenomena.*

*Once a VKHS dosage of a natural phenomenon is discovered, it can be deployed around the mucosal membranes and air passageways of the human face. This deployment produces a mobile “energy emitting force field” (BEACON) that acts as a potent killer of viruses and bacteria.*

*A variety of configurations (intensity and composition) of electromagnetic and chemical phenomena can be developed to kill aerosolized virus within an individual’s personal air space. This will be an entirely new field of science for our university and research institutions.*

*The combination of sensing, wearable and wireless communication technologies will provide for connectivity of the beacons, where individual beacons aggregate to produce a “distributed disinfection field” DDF with potential for exponential increase in germicidal activity.*

*The Internet of Things (IOT) allows geolocation features such as satellites and cell towers to automatically access, set and tune features of the individual user's beacons based on location and other metrics based on approved state and local safety guidelines. We believe the Social Antiviral System has the capacity to be a pandemic killer.*

## **Introduction:**

Despite advances in technology over the last hundred years, humans have not been able to overcome the threats imposed on them by the pathogenic microorganisms including (virus, bacteria, fungi). This is partly because, in the battle for genetic dominance, humans and microbes have continuously usurped each other's genetic information.

Viruses have killed hundreds of millions of humans in the last century alone (~100M Measles, ~200M Influenza, ~300M Smallpox), yet they have been crucially instrumental in the human evolutionary development.

It is estimated that between 5% to 25% of the human genome has been derived from a variety of viruses. Viruses have been instrumental in evolution of complex life including all of animal kingdom as well as plants and single cell organisms such as bacteria and algae (plankton). Therefore, a virus free existence may not only be undesirable but also impossible to achieve.

The act of manipulating the virus genome for specific functions is referred to as "gain function research", and if not carefully monitored could lead to disastrous global consequences. The same brilliance in humans that has led to all the wonderful discoveries in healthcare, can also be subverted to create weapons of war and mass destruction.

It is estimated that there may be up to 1.5 million virus that attack mammals and birds. Approximately half of these species can make the jump from animals to humans. A virus could adapt and change to infect humans either naturally or through manipulation in the lab. Human to human transmission can spread rapidly causing pandemics and significant mortality throughout the globe.

The question is whether we are prepared for the next pandemic, which may be more infectious and virulent. Can we do more to protect humans around the globe from the next Coronavirus Pandemic?

## **Current Art and Deficiencies:**

Human defense against the virus has traditionally involved two main categories including pharmaceuticals and non-pharmaceuticals. Pharmaceuticals include therapeutics and vaccines. Non-pharmaceuticals include sanitation (washing hands and surface disinfectants), isolation (social distancing) and use of barriers or PPE (Masks, gowns, shields). Therapeutics and Vaccines are interventions utilized inside the human body to kill the offending pathogen. Sanitation, masks, isolation are interventions utilized outside the human body to prevent contamination.

Over the last century, science has dramatically improved the effectiveness of pharmaceuticals, as evidenced by development of the smallpox, influenza, measles, hepatitis and polio vaccines.

However, non-pharmaceutical measures, have not advanced in meaningful ways. The countermeasures used in 2020 including (1. Social distancing 2. Masks 3. Washing hands) are the same countermeasures used in the Spanish Flu pandemic of 1918. We asked the following questions: Is there more that can be done with pharmaceutical measures to protect humanity? Is there more that can be done with non-pharmaceutical measures to protect humanity?

**Therapeutics and vaccines** have produced magnificent advances in the fight against the microbial pathogens, however, fundamentally these modalities have a significant weakness, which is that they must be introduced within the human body to either kill or enhance immunity against the virus. Any time a foreign compound is introduced into the human body there is potential for harm to the human body. There is a long list of therapeutics, which were initially touted as “wonder drugs” that later became defunct due to delayed and devastating complications.

Once the “enemy virus” enters the human body, the use of “overwhelming firepower” against the enemy is immediately constrained. Any drug/vaccine used against the virus can potentially be harmful to the human body. Accordingly, scientists must be extremely careful with the development of therapeutics and vaccines before deployment. Because careful development requires time, therapeutic modalities can never be considered nimble and effective responses to pandemics.

**Washing hands** and **Chemical Disinfectants** are extremely effective in killing microbes. Chemicals and soaps kill viruses with greater than 99.99% efficacy, essentially annihilating virus and bacteria on all surfaces.

It would be much easier to prevent pandemics if transmission primarily occurred through self-inoculation from contaminated surfaces (fomites).

Fomites are defined as “*objects or materials which are likely to carry infection*”, such as clothes, phones, furniture, and personal belongings. The fundamental limitation (weakness) of washing hands and disinfecting surfaces is that they are only effective against microbes on the surface of physical structures, but not effective against aerosolized virus.

Many of the viral infections occur due to “air-borne” transmission, which are suspected to occur at close range (conversational) or longer range (over several meters). These are generally described as either aerosol transmission or large droplet transmission. When infected patients breathe, cough or sneeze they can transmit infectious droplets of varying size between individuals by both short-range large droplets and aerosolized small droplets depending on distance from source.

Proximity to the source is considered a significant factor. However, the exact science of “aerosol transmission” is not fully understood. There is at least some concern the aerosol transmission of pathogens is more opportunistic and harder to detect.

There have been numerous studies showing viruses like (VZV) Chickenpox, measles and influenza to spread between isolation rooms and separate wards connected by corridors to cause secondary infections. Several studies have documented transmission of Ebola Zaire virus between animals without any direct contact, creating significant concerns regarding airborne transmission hazard.

In these cases, transmission occurred without any proximity to the source. It is conventional thinking that proximity is a requirement for airborne transmission, but what if that theory is incorrect?

The reality is that different viruses and different strains of the same virus have a wide range in their capacity for aerosol transmission.

Some viruses may be able to be aerosolized and survive in air within buildings, airplanes, trains, elevators, restaurants, public transit, hospital waiting rooms and lecture halls for hours and potentially even days.

Our knowledge about airborne transmission gleaned from air-sampling, animal transmission and epidemiological studies is still very primitive.

Therefore, we must consider an uncomfortable truth, which is that the longer the virus remains airborne, the more formidable the virus becomes, rendering many of our current countermeasures such as *social distancing* and *contact tracing* irrelevant and obsolete. This scenario may be the reason why up to 75% of the COVID 19 infections in Europe and the US could not to be traced back to a source.

The specific functionality of “*aerosolization*” can be enhanced in any virus, either by mutations in nature or in the laboratory.

Imagine that prototype A, a relatively benign virus with a general population fatality rate of 0.02%, is now altered to be able to survive in air for days instead of hours. This increased ***suspension time*** makes the virus more contagious, which allows exposure to much larger segments of the population, increasing the chance of transmission to the elderly and the immunocompromised.

Now imagine prototype B, a more virulent virus with a general fatality rate of 20%, which is enhanced with longer suspension times. It is a terrifying to consider that the same “enhanced aerosolization” capacity can now be conferred to prototype B.

Consider patient X infected with Prototype B. Patient X lives in an apartment building with 150 other occupants. Aerosolized virus B traverses the corridors of the building for days and infects each person who lives in the building. This pattern of infection occurs without any proximity to the source of infection. Patient X can contaminate every person in the building without ever encountering any of the 150 occupants.

Consider patient Y, who lives in the same apartment building as patient X. Patient Y contracts the virus without ever meeting patient X. The next day patient Y goes to work at a large government building with 2000 occupants. This building has an elaborate central air system with ambient airflow that can circulate the virus throughout the whole building. One can only imagine the devastation that will be caused by prototype B.

In summary we must consider that the virus can be altered to remain suspended in air for longer periods of time, which turns every large building, apartment house, airport, public transitsystem, school, lecture hall, and nursing home into a massive infection producing vector.

## Ultraviolet Light

In addition to chemicals utilized for sanitation, many have used ultraviolet light to sanitize structures. Surface disinfection by exposure to germicidal UV light has been used for over 50 years. However, despite its use for such a long time, the best way to utilize this technology is not well elucidated. What is the most effective distance from the UV source? How much exposure time to the UV light is necessary? What is the best angle of shine for the UV light (ceiling or wall)?

Most authorities suggest an 8ft distance and 30-minute exposure for maximum disinfecting effect of UV light to sanitize surface structures. The current germicidal UV lights are highly effective in disinfecting surfaces, but these systems have a disadvantage in that they are harmful to humans and therefore cannot be used when humans are present.

Because each human being has a lung capacity between 3 to 6 liters, whenever there is human movement, aerosolized viral particles are continuously recirculated within the air space. Therefore, UV germicidal systems, as currently used, do not have the ability to purify the air space in buildings and public transit systems to prevent humans from reinfecting each other.

Additionally, Far-UVC light (222nm) at low doses of 2mJ/cm have been shown to be highly effective in inactivating pathogens such as aerosolized H1N1 and other pathogens, while being very safe for humans without any damage to the human skin or eye.

These modalities have been recommended for overhead use (shining from the ceiling) in public locations to disinfect surfaces in order to limit the transmission and spread of air-borne mediated microbial disease. This method is limited because the effectiveness of UVC light is inversely proportional to the square root of the distance to the source ( $1/r^2$ ). In other words, the efficacy of UVC light drops as the distance from source to target increases. Therefore, the inability to maintain a close proximity of source to the target renders this technique less useful.

Furthermore, UV effectiveness is dependent on exposure time. Humans are highly mobile creatures; therefore, their bodies, clothing, wearables and personal belongings and equipment are unlikely to receive sustained exposure to UVC light in order for proper disinfection to occur.

**Isolation/Distancing:** Humans, as with most animals, are aggregate creatures. They gather and come together due to a deep need for interaction, which somehow relates to the survival of the species. Separating humans from each other appears to have intangible devastating psychological effects, which appear to be doubly more pronounced in children. One of the harshest punishments that humans impose on each other is isolation or (solitary confinement), which has been known to drive humans to madness.

The *dopamine reward pathway* in the human brain is directly motivated by human interaction, including our propensity to take risk, look for mates, and to be creative.

Social Isolation of humans alters the reward pathway, dulls our senses and destroys our will to live.

With prolonged isolation humans tend to become:

1. Psychologically unstable which leads to depression, anxiety, substance abuse and suicide.
2. Metabolically unhealthy by overeating, which leads to metabolic syndrome, diabetes and hypertension, which ironically decreases the chances of survival once infected with COVID- 19 Coronavirus.
3. Physically unhealthy which leads to musculoskeletal decline and physical pain.
4. All of which inexorably move human beings towards early decline and death.

Shutdowns to protect humans from spreading the virus also have dramatic negative economic and social consequences of depriving people from work and livelihood, as well as increasing starvation across the globe.

Therefore, the first order benefit of social isolation to prevent disease transmission is negated by the second order consequences of the decline of human psychological and physical condition as well as widespread economic devastation.

**Personal protective equipment (PPE)** includes masks, gowns, and shields.

In the healthcare environment staff are continuously instructed as to proper technique of application and removal of the personal protective equipment (PPE) because they are only protective if they are handled properly. Physicians and nurses understand that one minor mistake can cause gross contamination and render the whole exercise useless. In other words, if we incorrectly apply and remove our personal protective equipment, we paradoxically turn our PPEs into infective fomites, which further contributes to the transmission of the pathogenic disease.

PPE effectiveness is therefore ***technique dependent***, and the general public is unlikely to ever become error-free with PPE application and removal.

The second problem is that our current PPE is comprised of physical structures. Masks, gowns and shields are therefore ***“structure-full”*** with large surface areas that are contaminable. Large surface areas can convert the PPEs into fomites that propagate the virus.

In other words, if the virus was a “enemy navy” anticipating a land invasion, the large surface area of our PPE would be a vast sandy beach conducive to a “beach landing”. Which begs the question of how we can turn the sandy beaches into rocky cliffs, which cannot be invaded.

Current PPE allows the offending virus to get too close to the human body before creating a barrier. Gloves and masks are essentially attached to our bodies. Shields create a barrier 5 cm in front of the human face. Why do we let the virus get so close to our bodies before creating a barrier? Can we stop the virus at a distance away from our bodies? Can we create PPEs with “deflector shields” that block the virus faraway from the human body?

Over the last century, we have never conceived of PPE that does anything other than blocking the offending microbes. Our current PPE has no offensive capabilities. Can we create PPE that functions as an offensive weapon that kills the virus before it gets close to our bodies?

## The Solution:

What is needed is not Personal Protective Equipment (PPE) but rather THE SOCIAL ANTIVIRAL SYSTEM (SAS).

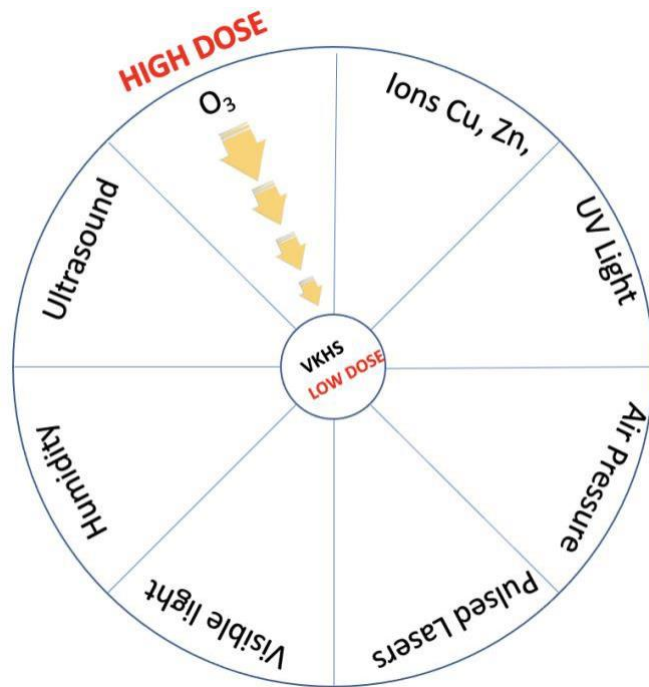
The Social Antiviral System (SAS) is comprised of individual BEACONS that emit electromagnetic and/or chemical energy to produce a personal field that kill microbes. Beacons aggregate to produce a distributed disinfection field (DDF) which maybe exponentially more powerful in microbiocidal activity. The SAS network is strengthened by “social un-distancing” and increased gatherings of humans.

Each Beacon may use a combination of natural and synthetic phenomena with inherent germicidal activity to block and kill pathogenic microorganisms within human air space and on surfaces. These phenomena include electromagnetic, physical, radioactive and chemical processes and agencies.

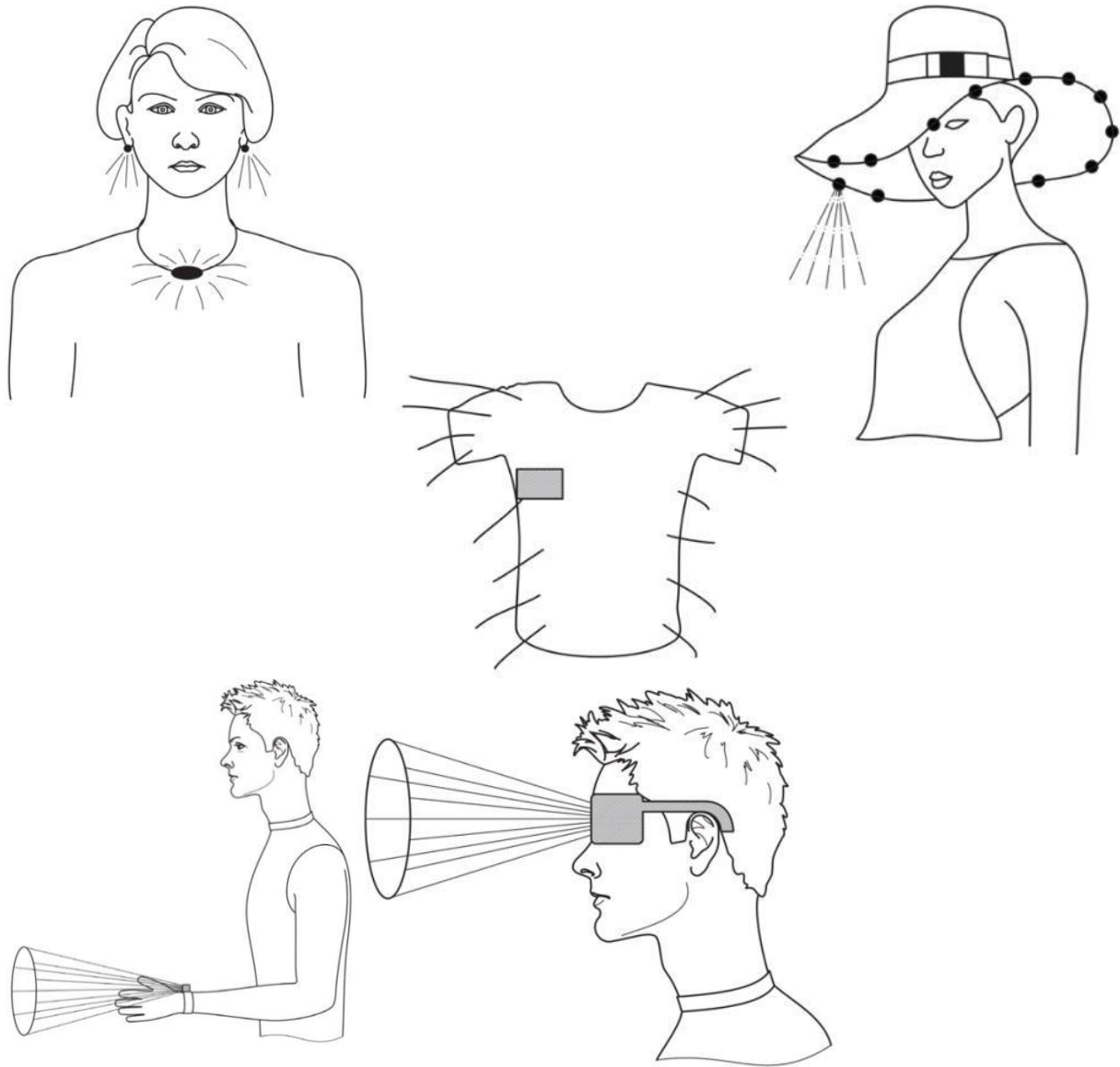
These electromagnetic and chemical phenomena include, without limitation (i) heat (especially greater than 56C) and the process of drying/desiccation (ii) UV light (especially the far-UVC light , 207-222nm) (iii) Ozone O<sub>3</sub> (iv) ions, such as in Zinc, Iron, and Copper ions (+/- mixed with peroxide) (v) Visible light (400nm to 800nm) and the phototoxic effects of intense pulses of visible light (vi) humidity (vii) ionizing or non-ionizing radiation, electron beams, gamma rays, x-rays with appropriate energy for sufficient degradation of the targeted pathogenic microorganism(s) while having an energy level safe for humans nearby the operating system (viii) aerosolization of chemicals (fogging) (ix) pulsed lasers tuned to a destructive resonance frequency for a specific pathogenic microorganisms, (x) ultrasonic energy (xi) air pressure (negative and positive) phenomena.

These natural and synthetic phenomena can be investigated, titrated and combined at appropriate doses to comprehensively kill microbes yet be completely safe for humans. We have described this process as “virus kill human safe” VKHS dose.





Some embodiments of the SAS may combine any of these sources within a beacon and integrate them together at VKHS doses within *wearables* and *associables* on the human body. This will enable every human being to function as a “sun-like” electromagnetic emitting beacon, with the capacity to sterilize their personal air space, as well as the surrounding surfaces.

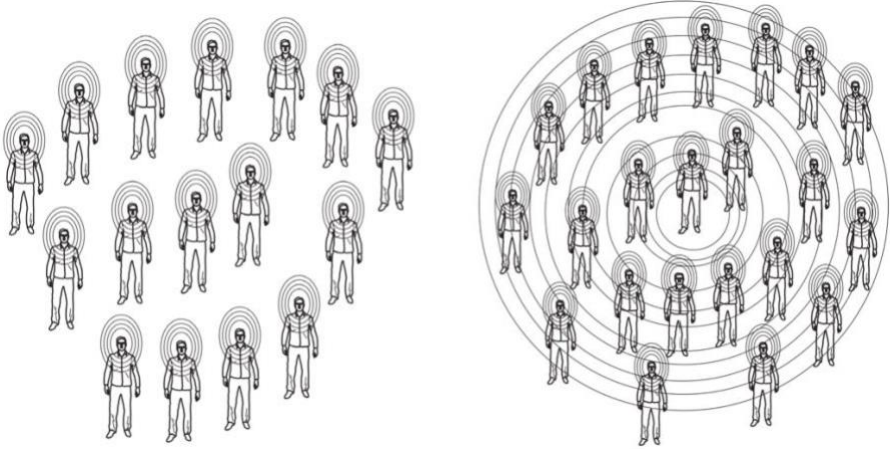


For example, the proper dosages of far UVC light, intense pulses of visible light, and heat in conjunction with Zn<sup>+</sup> ions, O<sub>3</sub> and humidity can be used to provide maximum protection for the human body by killing pathogens without harming humans. These sources of energy and beacon features may be attached to or associated with, the human body through wearables, including hats, caps, eyewear, sunglasses, watches, earrings, necklaces, rings, gloves, gowns, face shields, and clothing (shirts), mobile phones to produce a combination of properly dosed virus killing offensive weapons and structure-less “deflector shields.”

Natural phenomena can be titrated to low doses and deployed through wearables to produce invisible structures around the human body that act both as offensive weapons and defensive deflector shields. These invisible shields and rays represent a Mandorla which protects the human’s personal space.



SAS has the capacity to provide synergistic effects by combining and overlapping the fields from other beacons in the nearby area.



In contrast to our current thinking, SAS features are implemented in such a way so that the germicide effectiveness increases as the number of people increase and as the average separation distances between them decrease. This can be considered as extra protection with **“social un-distancing”** or **enhanced herd protection**.

## The Attributes of Social Antiviral System:

SAS *does not isolate*, conceal, stigmatize humans. It does not weaken the human will to live. SAS does not cause psychological, physical and economic decline. SAS is human aggregating rather than human isolating. SAS empowers each human individual to become a “mini-sunlike” energy emitting structure capable of killing microbes. Germicidal efficacy increases exponentially as the number of participating humans (beacons) increase and overlap, producing a “distributed disinfection field” DDF.

SAS for the most part is **structureless** denying aerosolized viral nuclei large expansive surfaces, which they desperately needed for survival. Because SAS is structure-less it is “**un-contaminable**” and cannot become a secondary fomite.

Effectiveness of current PPEs is highly dependent on “technique” or how they are applied and removed. SAS *is not technique dependent* and is for all practical purposes “idiot-proof”. All you have to do is convert your watch or hat into a virus killing energy emitting beacon, which can then become part of progressively larger frameworks.

SAS is fractal, distributed and decentralized.

Individual beacons of SAS *block the virus at a distance away* from the body producing a “deflector shield”.

The SAS beacons emit a combination of electromagnetic and/or chemical energies to *kill the virus* in both the air space and on surfaces, acting like offensive weapons.

The germicidal activity of the beacons is mobilized with individual humans and therefore continuously protects the human air space (air passageways and mucosal membranes). Thus, with SAS beacons microbiocidal activity is not limited by *exposure time* and *distance to source* concerns.

SAS beacons **wash our personal space**. Because SAS beacons maintain mobility and proximity with individual humans, they provide the novel capability of continuously killing microbes within the human air space.

We propose this concept as **Wash Your Space Initiative** and believe this is a non-pharmaceutical countermeasure that can protect against and prevent the next global pandemic.

SAS is an *intelligent system* with the following characteristics:

- a. SAS is made up of individual electromagnetic/chemical fields” (beacons) mobilized with human wearables creating a protective Mandorla around the human space.
- b. The beacons have the capacity to communicate with each other, as well as a central location, to gather information about the ambient microorganism threats; and solve a common problem of decreasing the viable count of pathogens in the air and on surfaces.
- c. SAS tolerates failure of individual beacons.
- d. SAS has the potential for exponential increase in germicidal activity from reinforcing and overlapping individual beacons, which then produce a more powerful distributed disinfection field DDF.
- e. SAS has the capacity to produce a DDF across a cloud, grid or cluster based on the level of threat and viral count.
- f. SAS has the capacity to sense the level of pathogenic threat in real-time and tune the germicidal response based on type, mixture and dose of electromagnetic and chemical components.

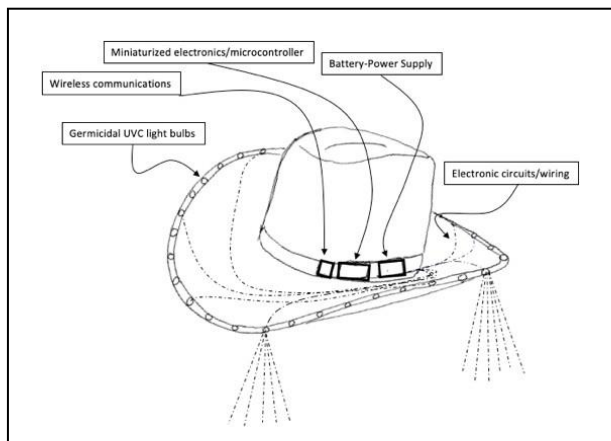
### SAS Can Be Immediately Prototyped:

SAS can be immediately prototyped with current technology without undue experimentation. For example, it is well known that far UVC light at low doses ( $2\text{mJ}/\text{cm}^2$ ) in the vicinity of 207nm to 222nm has microbiocidal properties against organism such as H1N1 and influenza but is considered safe for humans. Personalized beacons can be manufactured that employ far UVC light. These beacons may be referred to as *personalized UVC fields* that become spatially localized around the human body to produce a germicidal electromagnetic emitting beacon (*Mandorla*).

A large number of beacons in an area produce a “distributed disinfection field” *DDF*, where each physically separated beacon produces its own germicidal activity, but together, they collectively produce a global aggregate disinfecting system, that may be much stronger than an individual beacon.

It is conceivable that ions such as zinc and copper can be mixed with ozone at very low doses, humidified and released as a fogging system to augment the far UVC beacon.

It is also conceivable that the individual beacons may be incorporated into wearables/associables such as a hat, watch, jewelry or a cell phone, which may include its own (a) a power supply, (b) a set of miniaturized electronics, (c) an electronic wiring-circuitry, (d) wireless communications, and (e) far-UVC light sources.



Each individual autonomous beacon would work as a subset of a global aggregate operating system. Each beacon may interact with another beacon and with a central system to achieve a common goal of safely inactivating and killing microbes, bacteria and viruses on surfaces and within the air space; or at a minimum reduce the viable count of pathogens in air and on surfaces.

The *properties* of a distributed disinfection Field (DDF) may include one or many of the following: (i) there are several autonomous beacons independently producing microbicidal properties, (ii) the beacons communicate with each other to solve a common problem, that is to decrease the viable count of pathogens in air and on surfaces, (iii) the system tolerates failure in individual beacons as some users may be included within a group protection zone produced from the overlapping individual protection zones, (iv) the structure of the system may not be known in advance and may change during the execution of the distributed function as it may be an *ad hoc* response to the deployment of many overlapping personal protection zones within an enclosed space, (v) disinfection is distributed across a cluster, grid or cloud, and may be enhanced as the number of beacons are increased.

The SAS system may include a general *stored program computer* with memory (e.g., storing instructions and data) and a *microprocessor* responsive to instructions to control the personal beacons. This control may be based upon selection of an appropriate predetermined configuration for intensities/composition of the protective field from a set of configurations.

For example, a *configuration* for inside dining with fewer than 10 people in the room or a configuration to participation in a night club, concert, or travel on various public transit solutions. The user may choose the *most applicable configuration* and the personal protection generators will implement the desired pre-configuration. In other situations, configuration information for field settings appropriate to each venue may be provided to the systems from a third party (such as the venue operator).

Conditions in a venue may change over time, such as from an opening of a nightclub to maximum occupancy and activity of users within the nightclub. As long as each person is equipped with a personal beacon then the users have a measure of protection. When a sufficient number of these personal protective fields are responsive to variable configuration information, then the measure of protection may be improved, particularly when the correct configuration is available and active.

As ambient threats are measured/sensed by the individual user system and/or from on-site venue data collectors, configurations are updated appropriately as venue conditions change. Therefore, patrons of the venue may receive an enhanced level of protection. Smart features in a venue and incorporated into personal protective zone solutions allow the entities to negotiate the best settings, in some cases in real-time, for creating the overlapping protective fields tuned for the possible pathogenic threats that may be most likely to exist in the venue at any given time.

When entering a venue, operational parameters could be loaded into the various personal controllers. Similarly, when different jurisdictions (cities, states, countries) want to change/adapt the protective zone configurations, that could be easily established by a variable intensity non-homogenous set of multiple protective zone projectors.

Each jurisdiction may compile and publish these risks so users may respond accordingly. For example, as the number of confirmed cases of a particular pathogen increase in geographic locale, users in that locale may tune their systems against that pathogen. When the number of confirmed cases is high, the user may walk around with a relative intensity set of 8 out of 10. However, when the number of cases is low, the user may configure their system at a relative intensity of 2 out of 10 (10 max).

For venues that fear super spreading events, it may be desirable to require all patrons to set their individual solutions to the maximum setting.

Some solutions may be power hungry, especially those disposed in small/discreet form factors. In lieu of ceiling/wall mounted UVC emitters which are not very effective, a venue may include power transmitters to power the beacons worn by venue patrons. The venue is thus enhancing the safety of its patrons.

Effective pathogen transmission control allows the various applicable health departments to permit the venue to continue to operate, thus there is a mutual interest in the venue operator and the users in efficient long-term control of pathogens.

The Internet of Things (IOT) includes features that may allow some potential geolocation features to access, set and tune a user's *beacon features* automatically. Thereby deploying appropriate settings and configurations based upon location or state and local health and safety guidelines.