CLAIMS

What is claimed is:

1. A system for generating and monitoring an antimicrobial, comprising:

a computational system;

an antimicrobial sensor; [[and]]

an antimicrobial generator; and

an external communications device,

wherein the computational system, the antimicrobial generator, and the antimicrobial sensor are operatively connected, and

wherein the external communications device, the computational system, the antimicrobial generator, and the antimicrobial sensor is oriented within an enclosed volume under treatment.

2. The system of claim 1, wherein the computational system is at least one of a microprocessor and a microcontroller.

3. The system of claim 1, further comprising a separate sensor sub-system comprising:

at least one of a sensor sub-system microprocessor and a sensor sub-system microcontroller;

a sensor sub-system external communications device;

at least one of a sensor sub-system antimicrobial sensor and a sensor sub-system environmental sensor; and

a sensor sub-system computational system.

4. The system of claim 1, further comprising a separate generation sub-system comprising:

at least one of a generation sub-system microprocessor and a generation sub-system microcontroller;

a generation sub-system external communications device; and

a generation sub-system antimicrobial generator.

5. A system for generating and monitoring an antimicrobial, comprising:

a sensor sub-system comprising:

at least one of a sensor sub-system microprocessor and a sensor sub-system microcontroller,

a sensor sub-system external communications device,

at least one of a sensor sub-system antimicrobial sensor and a sensor sub-system environmental sensor, and

a sensor sub-system computational system;

a generation sub-system comprising:

at least one of a generation sub-system microprocessor and a generation sub-system microcontroller,

a generation sub-system external communications device, and

a generation sub-system antimicrobial generator; and

an enclosed space forming a volume under treatment.

6. The system of claim 5, wherein the sensor sub-system and the generation sub-system are oriented within the enclosed volume under treatment.

7. The system of claim 5, wherein the sensor sub-system is oriented within the enclosed volume under treatment and wherein the generation sub-system is oriented outside of the enclosed volume under treatment.

8. The system of claim 5, wherein the generation sub-system is oriented within the enclosed volume under treatment and wherein the sensor sub-system is oriented outside of the enclosed volume under treatment.

9. The system of claim 5, further comprising an HVAC air supply fluidically connected to the interior of the enclosed volume under treatment, wherein the sensor sub-system is oriented within the enclosed volume under treatment, wherein the generation sub-system is oriented outside of the enclosed volume under treatment, and wherein the generation sub-system is fluidically connected to the HVAC air supply.

10. The system of claim 5, further comprising an HVAC air return fluidically connected to the interior of the enclosed volume under treatment, wherein the generation sub-system is oriented within the enclosed volume under treatment, wherein the sensor sub-system is oriented outside of the enclosed volume under treatment, and wherein the sensor sub-system is fluidically connected to the HVAC air return.

11. A system for generating and monitoring ClO_2, comprising:

a device housing including an inlet;

a microcontroller or microprocessor;

a reagent container containing a reagent;

a device for generating a ClO_2 from the reagent; and

a sensing system,

wherein the sensing system measures a concentration of ClO_2 in ambient air introduced via the inlet, and

wherein the measurement of concentration of ClO_2 in the ambient air is communicated to the microcontroller or microprocessor, and wherein the microcontroller or microprocessor causes the system to generate the ClO_2 if the ClO_2 concentration is below a target value.

12. The system of claim 11, wherein the system comprises two reagent containers, and wherein each reagent container contains a different reagent.

13. The system of claim 12, wherein the device for generating the ClO_2 is a microfluidic mixer, and wherein the two reagents mix in the microfluidic mixer to generate the ClO_2.

14. The system of claim 11, wherein the device for generating the ClO_2 is an electrochemical generator.

15. The system of claim 11, wherein the system comprises one reagent container and one reagent, wherein the device for generating the ClO_2 is an electrochemical generator, and wherein the electrochemical generator uses an electrical potential to cause a reaction with the reagent that generates the ClO_2.

16. The system of claim 11, further comprising a barometric sensor to sense a pressure of ambient air introduced via the inlet, wherein the pressure is communicated to the microcontroller or microprocessor, and wherein a negative pressure causes the microcontroller or microprocessor to pause ClO_2 generation until a neutral and/or positive pressure is sensed by the barometric sensor.

17. The system of claim 11, further comprising an off-gas and waste chamber having a membrane, wherein waste from the generation of the ClO_2 is absorbed in an absorber material,

and wherein ClO_2 exits the off-gas and waste chamber through the membrane and into an ambient atmosphere.

18. The system of claim 11, further comprising an air pump electrically connected to the microcontroller or microprocessor and fluidically connected to the inlet via an air duct.

19. The system of claim 11, wherein the microcontroller or microprocessor is controlled by machine learning algorithms to alter system performance.

20. The system of claim 11, wherein the microcontroller or microprocessor is controlled by artificial intelligence algorithms to alter system performance.