CONCURRENT SESSION 6 – BIOLOGICAL AGENT DECONTAMINATION

Novel Technology to Reduce Risk of Viral Transmission in Enclosed Occupied Environments and Room Disinfection in Unoccupied Spaces

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METSS has continued the development of a novel chlorine dioxide (ClO2) gas dispersion system under a current EPA-sponsored Phase II SBIR project (Contract Number 68HERC-20-C-0005). The system design offers a safe and effective means to rapidly generate ClO2 vapor for on-site room decontamination in hospital and non-hospital settings. This technology is intended to meet the demands of health care markets committed to decontaminate porous materials and sensitive equipment in rooms or vehicles used for care or transport of Ebola-exposed patients. This technology gap was especially evident during the care and treatment of patients in the United States circa 2014. In addition, the current COVID-19 pandemic has demonstrated a clear need for technologies aimed at occupied spaces to reduce or prevent the spread of transmissible diseases through air or contact with surfaces contaminated with infectious microdroplets. Although social distancing, wearing masks, and routine hand washing does significantly reduce the risks associated with disease transmission from respirable droplets, METSS' developmental aerosol generation device delivers less than 0.1 ppm ClO2 in occupied spaces. The low concentrations of ClO2 were chosen based on IR&D efforts performed in METSS' Biosafety Level 2 (BSL-2) laboratory. During repeated trials, METSS demonstrated the efficacy of low level ClO2 against Pseudomonas aeruginosa, Staphylococcus aureus, and Klebsiella pneumoniae. Additional efficacy testing was performed using MS2 (non-enveloped) and Phi6 bacteriophage (enveloped) as surrogates to SARS-CoV-2 and other human viruses. Each of these organisms represent good models for evaluating respiratory pathogens and healthcare-associated infections through person-to-person contact. And, to the extent that fomite surfaces harbor and spread disease, low concentrations of ClO2 vapor have shown net positive benefits. METSS intends to transition this technology towards real-time protection against transmission of airborne pathogens and deposition of infectious virus particles on surfaces using low concentrations of ClO2 vapor.