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FAR-UV Technology and Germicidal Ultraviolet (GUV): A Policy and Research Review for Indoor Air Quality and Disease Transmission Control

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The COVID-19 pandemic underscored the vital role of indoor air quality (IAQ) in reducing airborne disease transmission indoors. Far-Ultraviolet (FAR-UV) technology, emitting light between 200-235 nm, emerges as a promising alternative to traditional wavelengths of Germicidal Ultraviolet (GUV), promoting airborne disinfection without many of the safety concerns related to improperly installed upper-room GUV systems. Studies indicate that FAR-UV effectively inactivates various pathogens, though questions remained around its safety, appropriate use cases, and the regulatory environment associated with this new technology. To understand these issues Johns Hopkins University Center for Health Security (CHS) recently convened a high-level working group to discuss the potential of FAR-UV technology as a public health tool. The meeting brought together interdisciplinary experts, including engineers, public health specialists, and policymakers, to evaluate current research findings and strategize on implementation pathways. Discussions emphasized the importance of FAR-UV as a scalable solution to enhance IAQ and reduce indoor disease transmission.

Findings from this working group demonstrate that FAR-UV has high efficacy and low energy requirements compared to other disinfection methods or other engineering controls. FAR-UV could be a promising tool to combat disease transmission in high-risk indoor environments and improve IAQ, particularly when coupled with ventilation systems. Further research is necessary, however, to ensure the safe use of FAR-UV technology, including the development a clearer understanding of the chemical interactions between FAR-UV light, ozone, and volatile organic compounds, as well as the need to identify best practices to mitigate secondary organic aerosols generated by FAR-UV use. Further studies highlighting the best use cases and appropriate venues for FAR-UV deployment are also recommended. Finally, the regulatory landscape for FAR-UV technology remains underdeveloped. Establishing standardized guidelines and conducting comprehensive human health risk assessments are crucial steps for informing policy toward ensuring safe and effective implementation. Regulatory clarity for this novel technology would foster public trust and encourage more widespread adoption.

FAR-UV technology holds significant promise as an engineering solution to enhance indoor air quality and control disease spread. Its high efficacy in pathogen inactivation, coupled with a favorable safety profile, positions it as a valuable tool in public health strategies. Implementation of FAR-UV, as well as GUV, technology should be considered for locations that have high infection potential. However, we must address environmental concerns and establish robust regulatory frameworks to realize its full potential in diverse indoor environments.

Primary author: OLSIEWSKI, Paula (Johns Hopkins Center for Health Security)

Co-authors: Mr ZHU, Alex (Johns Hopkins Center for Health Security); Mr LINDER, Alexander (Johns Hopkins Center for Health Security); Dr GRONVALL, Gigi (Johns Hopkins Center for Health Security); Dr BRUNS, Richard (Johns Hopkins Center for Health Security)

Presenters: Dr GRONVALL, Gigi (Johns Hopkins Center for Health Security); OLSIEWSKI, Paula (Johns Hopkins Center for Health Security)

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