



NEWS RELEASE

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FOR IMMEDIATE RELEASE

Kobe University-Ushio Inc. Joint Study Shows Irradiation of Filtered 222nm UV-C Light on Human Skin Reduces Bacterial Counts While Causing No Skin Damage

Cypress, California (August 2020) — Ushio Inc. (TYO: 6925; headquarters in Tokyo, Japan) and a research group led by Dr. Ryosuke Kuroda, Chairman and Professor of the Department of Orthopaedic Surgery, Kobe University Graduate School of Medicine, have completed a research study that shows that irradiation of filtered 222nm UV-C light on human skin reduces bacterial counts while causing no injury to the skin. This is the first study on the safety of 222nm UV-C light conducted on humans. The research paper regarding this study is published on PLOS ONE and can be accessed [here](#).

In this study, Ushio's Care222® UV-C disinfection* device irradiated 500mJ/cm² of 222nm UV-C light on the back of 20 healthy volunteers aged from 20 to 80 years. The Care222 device includes an optical filter that eliminates radiation from wavelengths above 230nm. Twenty-four hours after the irradiation, none of the participants showed any signs of erythema (redness of skin).

The back of each participant was irradiated again with 500mJ/cm² of 222nm UV-C light using the Care222 device to measure the bacterial flora count on the skin scraped with a swab. The bacterial flora count was taken pre-irradiation, 5 minutes after irradiation, and 30 minutes after irradiation. The bacterial flora count significantly decreased—by almost 90%—after irradiation with the Care222 device.

When the irradiated area of the participants was assessed three months post-irradiation, none of them showed any signs of erythema, and no adverse event was noted.

Based on these findings, the researchers concluded that irradiation of filtered 222nm UV-C is safe and has a bactericidal effect on the human skin. Note that a previous joint study between Kobe University and Ushio Inc. showed that repeated irradiation of filtered 222nm UV-C light did not cause skin cancer or cataract to hairless mice (a type of mice with extra sensitive skin). Our press release about this research study can be accessed [here](#).

It is important to use *filtered* 222nm UV-C light in occupied spaces. Unfiltered 222nm UV-C lamps will emit radiation in the 230nm (UV-C) to 320nm (UV-B) range. Irradiation without blocking these higher wavelengths of light has been reported to cause erythema at 50mJ/cm² and damage to the cellular DNA at 63mJ/cm² or more.

Ushio's Care222 device features a specially designed short pass filter that is based on groundbreaking research and technology developed by Columbia University and filters the longer UV wavelengths from the lamp.

For more information about the properties of 222nm UV light and Care222 excimer lamps, please visit <https://www.ushio.com/product/care222-mercury-free-far-uv-c-excimer/>.

*Any references to “disinfection” are referring generally to the reduction of pathogenic bioburden and are not intended to refer to any specific definition of the term as may be used for other purposes by the U.S. Food and Drug Administration or the U.S. Environmental Protection Agency.

The Care222 standard character mark and stylized logo mark are registered trademarks of Ushio America, Inc., in the United States, European Union, and United Kingdom.

About Ushio America, Inc.

Ushio America, Inc. is a vertically integrated solutions company for lighting systems and components utilizing xenon short arc lamps, lasers, ultra-high-pressure lamps, excimer, metal halide, LEDs (specialty sensing and general illumination), halogen, fluorescent lamps serving semiconductor, printed circuit, video projection, cinema, medical, life sciences, UV curing, germicidal, horticulture, general lighting, graphic arts, scientific medical, infra-red heating, lamp and laser drivers, systems and services, and numerous other applications. Established in 1967 as a subsidiary of Ushio Inc., in Tokyo, Japan, Ushio America, Inc. offers a full spectrum of over 2,500 products and services to its customers. Visit www.ushio.com for more information.

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