

THE BLOG

Tackling Superbugs with the Microchip of Health

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Superbugs – bacteria that have become drug-resistant primarily through the overuse of antibiotics – are on track to [kill one person every three seconds](#) and set medicine back to the Dark Ages by 2050. There are drug-resistant types of gonorrhea, tuberculosis and staph infections, among many other diseases. The Centers for Disease Control and Prevention (CDC) estimates that each year over [2 million people become infected](#) with antibiotic-resistant bacteria and over 23,000 people die. Superbugs are not the only germs giving health authorities grey hairs; Ebola and Zika outbreaks are also making headlines. As the World Health Organization (WHO) [rallies its resources](#) to prepare for the next epidemic and scientists struggle to invent new antibiotics and to find treatments for superbugs, the real solution is already here: using ultraviolet (UV) LEDs to deactivate superbugs before they can come in contact with and harm our bodies. Introducing the “microchip of health.”

Recent advancements have evolved UV-C LED technology into the “microchip of health” – with maximum power available in the smallest form (as small as 6.5 millimeters or the size of a pencil eraser), producing concentrated disinfection power. Years ago, the microchip transformed everything by packing the power of computing into tiny, portable chips that spurred inventions from robot dogs all the way down to the iPhone. Its power getting stronger, its size getting smaller. Today, the same approach is being applied to UV light. With their short wavelengths and high power density, UV-C LEDs

quickly deactivate the DNA of bacteria, viruses and other pathogens, thereby preventing disease.

For over thirty years, UV-C light has been used for disinfection, preventing bacteria from reproducing on the surfaces we touch, the water we drink and the air we breathe. To date, UV light has only achieved a small percentage of the disinfection market due to limitations that restrict its widespread application.

Traditionally, UV-C technologies are powered by mercury vapor lamps. Although mercury lamps have made traction in delivering industrial disinfection, limitations associated with mercury have prevented it from scaling. Mercury lamps involve the use of [one of the top ten](#) most dangerous chemicals. In addition, mercury lamps are fragile, bulky and hard to use, requiring frequent maintenance and replacement. With all of these factors in mind, if a mercury lamp is misused, it can create an extremely hazardous environment and negatively affect our health and wellbeing.

Instead of vaporizing toxic mercury to generate UV light, UV-C LEDs use semiconductor technology to achieve the same benefits, while completely eliminating the risks associated with mercury. UV-C LEDs are more compact, offer higher power density and power on instantly – making disinfection not only safer but more efficient.

This “microchip of health” can be integrated into a variety of applications that will spur the next generation of health and hygiene products, providing cleaner and safer environments for people around the world. Imagine a handheld device that can disinfect a physician’s phone – one of the most germ-infested objects in a hospital. Or a device small and effective enough to disinfect a catheter seconds before it’s inserted. [Dirty scopes](#) and other medical devices have long been culprits of numerous disease outbreaks, and the “microchip of health” can be the answer. Imagine a water bottle that can disinfect the water

right out of your faucet. Or one that can measure the level of water contamination for a trail runner or hiker to determine if it's safe to drink.

With the advanced sensing and imaging capabilities of today's smartphone devices, people can also measure and calculate the area dosage of UV and achieve up to 99.9999 percent disinfection efficacy within 10 seconds on high risk areas such as door knobs, remote controls and utensils.

The possibilities for the "microchip of health" are endless. Just as microchips sparked a flurry of innovation that generated incredible hardware and devices that most of us never imagined, UV-C LED technologies promise to do the same. With the ability to disinfect everything from doorknobs to drinking glasses, UV-C eliminates potentially dangerous bacteria, including germs that cause skin diseases, nasty colds and drug-resistant infections. Superbugs and viruses could be a thing of the past.

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