

# UV LED Inactivation of Viruses for Vaccine Development

*UV LED delivers precisely controlled light intensity and dosage to provide various levels of inactivation*

Current procedures for vaccine research often utilize gamma radiation to inactivate a virus while leaving host protein structures intact for further analysis like ELISAs. Unfortunately, gamma radiation technology is not widely available so scientists are required to use BSL3 level containment for research with live viruses. Other chemical methods exist to inactivate viruses but these also destroy protein structures. Developing a more user friendly and easily obtainable inactivation protocol for samples would save time, prevent the need to move amongst differing biosafety levels, and also allow more widely available samples for testing outside their current environment.

High intensity UV LED technology offers researchers the ability to inactivate viruses in serum/plasma for vaccine development. An inactivated vaccine (or killed vaccine) is a vaccine consisting of dead but antigenically active viruses or bacteria, which evokes production of protective antibodies without causing the disease. Preliminary data indicate that high-intensity, precisely controlled ultraviolet light can be tuned to partially or completely inactivate viruses with minimal to no damage of recognition host protein structures. Killed vaccines are safest type of vaccines for everyone, including those that are autoimmuno-compromised.

## ***Advantages of UV LED Technology:***

- ✦ Readily available to all biosafety levels
- ✦ Maintains antibody structures - Preliminary studies indicate
- ✦ Speeds lab throughput
- ✦ Allows for more testing
- ✦ Reduce lab consumables costs
- ✦ No potential mercury contamination
- ✦ No warm up time
- ✦ Rapid and reliable disinfection










## ***Applications: Pathogen Disinfection***



UV LED successfully inactivates Influenza A (virus), Clostridium difficile (spores), Aspergillus brasiliensis (mold), and Staphylococcus aureus (bacteria), just to name a few. UV LED inactivation of microorganisms assures that surfaces are disinfected without the chemicals and time-consuming rinsing. In addition, using Phoseon's advanced technology, significant levels of disinfection are reached in each of these organisms in under 3 minutes, sometimes in under 5 seconds!

# UV LED Systems for Viral Inactivation

Phoseon Technology is the first to develop a UV LED system that surpasses 5 W/cm<sup>2</sup> at 275nm, significantly higher than the levels reached previously by other LED systems, and surpassing many other technologies in the market by an order of magnitude. This milestone development enables users to utilize UV LED systems where they were prohibited in the past. Phoseon is trailblazing a new path by building high-performance UV LED systems that bring improved disinfection capability to various processes.

Product Name	Peak Irradiance (W/cm <sup>2</sup> ) @ Wavelength (nm):		Key Features
	275	365	
<b>KeyPro™</b>			
<b>KP100</b>			
	2	1	<ul style="list-style-type: none"> <li>• Compatible microplate shelf adjustable from 4 to 80mm, in 4mm increments</li> <li>• Proprietary SLM™ scanning array</li> <li>• Safety lock door system, also acts as emergency stop</li> </ul>

Product Name	Emitting Window (mm)	Peak Irradiance (W/cm <sup>2</sup> ) @ Wavelength (nm):		Key Features
		275	365	
<b>KeyPro™</b>				<b>Air-cooled</b> 
<b>KP200</b>				
	75 150 225 300	x 20	0.75	<ul style="list-style-type: none"> <li>•  TargetCure™ technology</li> <li>•  WhisperCure™ technology</li> <li>• Scalable</li> <li>• Digital/analog control</li> <li>• Small form factor</li> </ul>
<b>KP300</b>				<b>Water-cooled</b> 
	125 150 225 250 300	x 20	1	<ul style="list-style-type: none"> <li>• Scalable</li> <li>• Digital/analog control</li> <li>• High performance disinfection applications</li> </ul>

Product Name	Peak Irradiance (W/cm <sup>2</sup> ) @ Wavelength (nm):		Key Features	
	275	365		
<b>KeyPro™</b>			<b>Air-cooled</b> 	
<b>Explorer</b>				
	25	x 10	.5	<ul style="list-style-type: none"> <li>• Small footprint</li> <li>• Application development tool</li> <li>• Biomolecule inactivation and modification</li> </ul>