COMBATTING FUTURE BIOLOGICAL THREATS – HOST-DIRECTED INTERVENTIONS TO EMERGING THREATS FOR RAPID RESPONSE

Advancing Rapid Countermeasures Against Viral Threats with the VTose® Antiviral Platform

Sophie Walker Kimer Med Limited **Rick Kiessig** Kimer Med Limited **Phil Oliver** Kimer Med Limited
Rishi Pandey Kimer Med Limited **Andy Clover** Kimer Med Limited

The emergence and mutation of viral pathogens presents significant threats to global health and military operations. Traditional antiviral strategies often target specific viruses, which limits their utility against new or mutating pathogens. This - and the lack of approved antiviral therapies for more than 200 known pathogens - underscores the urgent need for versatile, broad-spectrum antivirals capable of confronting both known and yet-to-emerge viral threats.

Kimer Med's VTose Antiviral Platform employs a novel approach to this problem, leveraging cellular penetrating peptides (CPPs) and recombinant fusion protein technology to engineer broad-spectrum antivirals. The Platform aims to enhance mission effectiveness by providing rapid, versatile medical countermeasures against a wide array of viral threats.

Our methodology encompasses the creation of customized antiviral candidates, validating their efficacy via cytopathic effect reduction assays, and subsequent optimization. This approach not only accelerates drug discovery times but also provides the means to circumvent common viral defence mechanisms, making it a formidable tool against emerging and mutating viral threats.

Central to the Platform's mechanism is the targeting of double-stranded RNA (dsRNA), a replication by-product common to virtually all viruses, including DNA viruses. Our strategy is designed to neutralise virus-infected cells selectively and rapidly, while not harming uninfected cells.

Early-stage in vitro studies confirm the Platform's broad-spectrum potential. Significant efficacy (up to 100%) has been demonstrated against nineteen viruses to date, including Dengue and Zika, alongside very high (up to 100%) cell survival rates, indicating low toxicity.

Our Platform represents a significant advance in the development of broad-spectrum antivirals. The ability to effectively target a common viral element (dsRNA), and design to bypass viral defenses, offers a promising avenue for rapid response to a wide range of viral threats, aligning with both military and global health security objectives.

In the context of DTRA/JSTO's commitment to innovative defence mechanisms, our platform offers a compelling contribution to enhancing protection against global pandemics and biological threats.