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Australian Nanoshield Antiviral Product Effective Against SARS-CoV-2

Nestlé Research sets real world evaluation benchmark for commercially available antiviral coatings. Results confirm only Nanoshield met all criteria

PERTH:- Every day Australians going about their normal lives touch surfaces that are potential virus carriers. From banks to airports, from office buildings to public transport the potential to pick up bacteria and viruses, including the SARS-CoV-2 virus that causes COVID-19 could be lurking.

There are any number of commercially available antiviral sprays and films claiming to provide surface protection for communities that to date have been untested, especially not in a normal working environment. In fact, as a COVID-19 precaution, many businesses have shut down access to commonly used terminals and screens to protect people against surface transmission of the virus. That has now changed.

For the first time peer reviewed scientific research on a selection of readily available antiviral surface protection products has been carried out to test their claims in an every- day, real world environment.

Clinical testing carried out by researchers from Nestlé Research's, Institute of Food Safety and Analytical Science, in Lausanne, Switzerland on a number of protection products has now been published in Applied and Environmental Microbiology the journal of the American Society of Microbiology. It showed that the antiviral surface protection film Nanoshield, developed by Australian nanotechnology company Nanoveu Ltd is highly effective in providing surface protection against SARS-COV-2, the virus that causes COVID-19.

The research concluded Nanoshield was the most effective at reducing SARS-CoV-2 (COVID-19) immediately, in durability testing and also effective despite the presence of other organic matter.

The research identified that while SARS-CoV-2, the virus responsible for the COVID-19 pandemic, is transmitted mainly by person-to-person through respiratory droplets, antiviral coating solutions offer an additional measure to mitigate the risk of SARS-CoV-2 transmission from high-touch surfaces.

“The deployment of antiviral coatings is not new, but what is currently lacking is solid scientific evidence of the efficacy of commercially available self-disinfecting surfaces under real-life conditions,” the Nestle report stated.

“A novel and robust approach to evaluate the antiviral activity of coatings was developed, assessing three commercially available leave-on surface coating products for efficacy against human coronaviruses HCoV-229E and SARS-CoV-2. The assessment is based on three criteria that reflect real-life settings, namely (i) immediate antiviral effect, (ii) effect after repeated cleaning of the coated surface, and (iii) antiviral activity in the presence of organic material. The results showed that only a copper compound-based coating successfully met all three criteria.”

The Nestle research identified that this new approach now creates a benchmark upon which all currently available antiviral coatings and future coating developments should be judged to avoid unjustified claims.

“In the current COVID environment a lot of claims are being made about the efficacy of commercially available antiviral products without solid scientific evidence,” said Nanoveu executive chairman and CEO, Alfred Chong. “The Nestlé results confirm Nanoshield’s status as a globally significant product with the ability to make surfaces safer.”

“We have long believed the importance of scientific research in the efficacy of our products, and we welcome the validation of our claims as the leading antiviral coatings for high touch surfaces,” Mr Chong said. “Many businesses and government agencies have been looking to science to address the challenges of ‘living with COVID’ as the pandemic rages through countries. This is now one solution!

“Nanoveu’s copper-based technology has demonstrated to be highly effective in a number of real-world scenarios, outperforming other products including quaternary ammonium compounds which lose their efficiency in the normal course of cleaning, and reactive oxygen species which are found not to be effective in everyday environments.

“Our robust network of suppliers, fabrication and manufacturing partners and testing agencies has ensured that we have a solid business-case for clients looking for additional measure to mitigate the risk of SARS-CoV-2 transmission from high-touch surfaces,” he said.

“Now the scientific research has been reviewed and published, Nanoshield becomes one of the most economical options to deliver protection and peace of mind. We are grateful to Nestlé Professional Group and their research laboratories for sharing this important finding. They are a fantastic example of a global brand which, once aware of the results, employed the Nanoshield product offering across their network. From a marketing perspective, the research also allows us and our distribution partners to directly address customer’s main concern of protecting staff, customers and the community from COVID-19.”

Report Summary

Citing the lack of solid scientific evidence surrounding commercially available self-disinfecting surface coatings under conditions that mimic real-world use, Nestlé Research analysed the effectiveness of Nanoveu's Nanoshield product and two other products under a number of conditions, for immediate anti-viral activity, longer-term durability after repeated cleaning of the coated surface and the anti-viral activity after frequent touching by human hands.

Base-case test conditions saw the three commercially available products assessed against SARS-CoV-2 and human coronavirus HCoV-229E by placing the virus on coated and un-coated 25cm² surfaces. The viral sample was dried on the surfaces at room temperature for 15 minutes and subsequently assessed at the 0, 30 and 120 minute-mark. Short evaluation periods were chosen to reflect real-world use cases where anti-viral activity needs to occur within a rapid timeframe

Initial testing was conducted using the HCoV-299E virus; another human coronavirus and a recognised surrogate for SARS-CoV-2. Of the three products, at time stamp '0' one showed no reduction of the HCoV-229E virus, 0.6 log₁₀ at 30 minutes and no antiviral activity at 120 minutes. Based on these results it was not investigated any further.

Of the other two products, at time stamp '0' Nanoshield inactivated a higher percentage of HCoV-229E of the two (3.5 log₁₀ vs 2 log₁₀ reduction (approx. 99.95% vs 99%). As both products showed immediate anti-viral activity against the surrogate, evaluation using the SARS-CoV-2 virus (COVID-19) after 0, 30 and 120 minutes was conducted at room temperature. Nanoshield achieved a >4 log₁₀ compared to >1.6 log₁₀ (approx. 99.99% and 96% respectively).

Importantly, the immediate antiviral activity of the competitor was only observed when the spray coating was applied without subsequent wiping. No immediate antiviral activity was observed when the coating was sprayed on the surface directly followed by wiping to evenly distribute the product on the surface.

Simulated real-world cleaning procedures of the coated surfaces was also done using microfiber cloths and both a water-based detergent and 70 percent ethanol. The coatings were wiped with both solutions 1, 7, 30 and 90 times. The antiviral activity of Nanoshield remained intact after 90 wipes with a microfiber cloth using both water-based detergent and alcohol sanitiser. The antiviral activity of the other product was completely removed after one round of cleaning with either cleaning product.

As Nanoshield successfully passed the first two research criteria it was further evaluated for the touch criteria. The film was touched between 10 to 50 times by unwashed hands prior to virus inoculation to simulate the daily use of a high touch surface. This allowed an evaluation of the effect organic material from unwashed hands has on the antiviral activity. The anti-viral activity of Nanoshield was still very high after both 10 (4 log₁₀ approx 99.99%) and 50 touches (>94%).

Fifty touches correspond to a daily touching frequency of a highly used vending machine. Once clean of organic matter, Nanoshield's full efficacy was reinstated, suggesting a daily clean is sufficient. As Nanoshield fulfilled all three evaluation criteria it can be considered an efficient antiviral coating.

Based on the outcomes of the scientific review, Nestle Research deemed Nanoshield the preferred antiviral coating solution. Nestle Professional is now a global client of Nanoveu Limited (NVU).

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