Nanoveu Limited
U1, 18 Olive Street
Subiaco WA 6008
+61 8 6244 9095
www.nanoveu.com

ASX RELEASE **9 February 2022**

ASX: NVU

Nanoveu Launches Durable Spray Coating Effective Against MHV-A59 (a Surrogate for COVID-19)

Highlights:

- **Nanoveu has launched 'Liquid Film', a spray on version of the Company's antimicrobial surface protection films, with the product achieving a >99.99% reduction of MHV-A59 (a surrogate for COVID-19) within 10 minutes.**
- **Liquid Film has been approved by Singapore's NEA (National Environment Agency) as a self-disinfecting surface coating product effective against coronaviruses, representing the second Nanoshield™ product listed by the NEA.**
- **From testing by the Department of Microbiology & Immunology, Yong Loo Lin School of Medicine at the National University of Singapore (NUS), Liquid Film (Spray) demonstrated 300 weeks of durability, making the Company's Liquid Film a market leading technology breakthrough.**
- **The Liquid Film (Spray) allows the Company to coat surfaces much faster including irregular shapes previously difficult to do using the existing Nanoshield™ films.**

Nanoveu Limited (**ASX:NVU**) ("**Nanoveu**" or the "**Company**") is pleased to announce the launch of 'Liquid Film', a spray-on version of the Company's antibacterial and antiviral surface protection films, with the product achieving a >99.99% reduction of MHV (Murine coronavirus) within 10 minutes. MHV is listed by the Australian TGA as a preferred surrogate to justify effectiveness against COVID-19.

Nanoveu Founder and CEO, Alfred Chong, commented: ***"We are very pleased to have launched our new Nanoshield™ Liquid Film, with successful test results proving it highly effective against Coronavirus. Importantly, the product was still effective when tested under conditions with abrasion after being rubbed 6,000 times, demonstrating its suitability for high traffic public spaces. We are also pleased to announce that the Nanoshield™ Liquid Film has been listed by Singapore's National Environment Agency (NEA) as a self-disinfecting surface coating effective against COVID-19 virus. With only 6 products in total listed by Singapore's NEA, two of these are Nanoveu products and the Liquid Film having the fastest efficacy in this category and being the longest lasting."***

Liquid Film was developed in collaboration with Nanoveu's exclusive partners in Japan and carries the "Made in Japan" quality in the same tradition as the Company's Film products.

Test Results

Stainless steel surfaces were coated with the Nanoshield™ liquid film spray and tested under conditions both with and without abrasion.

The modified ISO 21702 antiviral assessment was conducted by the Department of Microbiology & Immunology, Yong Loo Lin School of Medicine at the National University of Singapore (NUS). The Liquid Film achieved a >99.99% reduction of the viral load within 10 minutes, and to assess the durability of the spray, tests were undertaken comparing untouched and heavily worn spray coatings.

To quantify how long Liquid Film will likely remain effective on a surface, a durability protocol was conducted with the coating rubbed with a 500g load applied using a crockmeter in accordance with ISO 20433.

After 3,000 cycles (6,000 scrubs) the worn coated surface still visually displayed a chemical reaction when tested with hydrogen peroxide – demonstrating the presence of the active agent, copper. The worn coated samples achieved the same antiviral performance as the untouched samples in lab tests conducted at NUS.

The US Environmental Protection Agency (EPA) states that 10 scrubs/rubs = 1 week of durability, meaning that the product is effective in durability for 300 weeks, making the Company's Liquid Film a market leading technology breakthrough.

The Liquid Film's resilience to abrasion will increase its durability when applied in public spaces, with the spray providing significant market opportunities, as it allows the Company to coat surfaces much faster including irregular shapes which cannot be coated with Nanoveu's existing Nanoshield™ film.

The test results are appended.

Listing by Singapore's NEA as a Self-disinfecting Surface Coating

Separate to the test work, Singapore's National Environment Agency (NEA) has listed Nanoveu's Liquid Film as a self-disinfecting surface coating product effective against the COVID-19 virus, representing the second Nanoshield™ product listed by the NEA after testing a total of 53 products. On 8 August 2021, Singapore's NEA listed the Nanoshield™ product as the first residual based product effective against coronavirus, creating a new category for Residual based products.

https://www.nea.gov.sg/our-services/public-cleanliness/environmental-cleaning-guidelines/guidelines/list-of-household-products-and-active-ingredients-for-disinfection-of-covid-19

- Ends -

This announcement has been authorised for release by the Board of Directors

For further information, please contact:

Scott Beeton

Non-executive Chairman

t: +65 6557 0155

e: info@nanoveu.com

For media / investor enquiries, please contact:

Jane Morgan

Investor Relations

t: 0405 555 618

e: info@janemorganmanagement.com.au

About Nanoveu Limited

We are technology innovators who specialize in modern, cutting-edge nanotechnology that improve the way we live, from reducing contagious transmissions on high touch points to immersive vision-based entertainment. https://www.nanoveu.com/

Nanoshield - is a film which uses a patented polymer of Cuprous embedded film to self-disinfect surfaces. Nanoshield antiviral protection which is available in a variety of shapes and forms, from mobile screen covers, to mobile phone cases and as a PVC commercial film, capable of being applied to a number of surfaces such as doorhandles and push panels. The perfectly clear plastic film contains a layer of charged copper nanoparticles which have antiviral and antimicrobial properties. This technology is also being applied to fabric applications targeting use in the personal protective equipment sector.

EyeFly3D - is a film applied to digital displays that allowed users to experience 3D without the need for glasses on everyday mobile handheld devices.

Customskins - are vending machines capable of precisely applying screen covers to mobile phones with an alignment accuracy of 150 microns.

EyeFyx - currently in research and development stage, EyeFyx is a vision correction solution using hardware and software to manipulate screen output addressing long-sightedness without the need to wear reading glasses.

EVALUATION OF THE VIRUCIDAL PROPERTIES OF COATED NON-POROUS MATERIALS AGAINST CORONAVIRUS

Prepared for SPONSOR:

NANOVEU PTE LTD

Block 81 Ayer Rajah Cresent, 03-43, Singapore 139967

Prepared by TESTING FACILITY:

HOST AND PATHOGEN INTERACTIVITY LABORATORY

Department of Microbiology & Immunology, Yong Loo Lin School of Medicine, National University of Singapore
Block MD4, 5 Science Drive 2,
Singapore 117545

Vincent T. K. Chow, MD, PhD, FRCPath, MBBS, MSc, FISAC
A/Professor of Microbiology & Education Director for Microbiology
Principal Investigator, Host and Pathogen Interactivity Laboratory
Department of Microbiology & Immunology, Yong Loo Lin School of Medicine, National University of Singapore

MD4, Level 3, Kent Ridge, Singapore 117545 Email: micctk@nus.edu.sg

1. PURPOSE OF STUDY

The purpose of this study was to evaluate the virucidal activity of stainless steel surfaces coated with Nanoshield Liquid Film (SLF 401) product when challenged with Coronavirus.

2. SCOPE

This study was adapted and modified from ISO 21702 (Measurement of antiviral activity on plastics and other non-porous surfaces). It was designed to evaluate the virucidal property of Nanoshield Liquid Film (SLF401) product. The virucidal efficacies of stainless steel (SUS430) samples coated with Nanoshield Liquid Film (SLF 401) – without and with abrasion – were tested. Uncoated stainless steel (SUS430) samples were used as controls in this study.

Murine Hepatitis Virus, strain A59 (MHV-A59) was inoculated onto the coated test and uncoated control stainless steel surfaces, and incubated at room temperature (25°C) for 10 and 30 minutes. Following the timed exposure, the virus samples were recovered and inoculated onto susceptible H2.35 cells for analysis by virus plaque reduction assay. Tests and controls for each condition (without and with abrasion; 10 and 30 minutes contact time) were performed and evaluated in quadruplicates. The testing procedures are detailed in section 5.

3. JUSTIFICATION FOR THE SELECTION OF THE TEST SYSTEM

The Sponsor has requested an antimicrobial label claim for Coronavirus. MHV-A59, a mouse beta-coronavirus, was used for testing.

4. TEST MATERIALS

The evaluated test and control materials were provided to the Testing Facility by the Study Sponsor, complete with appropriate documentation. Certificates of Analysis were not provided to the Testing Facility. Responsibility for the determination of the identity, strength, purity, composition, and stability of the test and control materials, as well as the retention of the test and control materials, rests with the Sponsor.

Test materials: Stainless steel (SUS430) samples coated with Nanoshield Liquid Film (SLF 401) – without and with abrasion.

Receipt Date: October 2021.

Expiration Date: Not Provided.

Control Materials: Uncoated stainless steel (SUS430) samples. Receipt Date: October 2021.
Expiration Date: Not Provided.

5. METHODS

5.1 Test Conditions

Exposure Time: 10 and 30 minutes.

Exposure Temperature: Room temperature (25 °C).

5.2 Host Cell Preparation

The challenge viral strain used was the MHV-A59 strain. H2.35 mouse liver epithelial cells were used for this study. Cells were maintained as monolayers in disposable cell culture labware. Prior to testing, host cell cultures were seeded into multi-well cell culture plates. Cell monolayers were ~80% confluent, and less than 24-hours old before inoculation with the virus. The culture medium (CM) consisted of DMEM supplemented with 10% fetal bovine serum.

5.3 Test Virus Preparation and Identification

The challenge viral strain MHV-A59 was propagated, stored, and used for this study. On the day of use, aliquots of a stock virus suspension were removed from a -80°C freezer and thawed on ice. The stock virus was diluted to obtain the titer of 2×10^5 PFU per 20 µl (for coated and uncoated samples). Virus-specific plaque reduction assay (for viable virus quantification) was performed in H2.35 cells susceptible to virus infection.

5.4 Procedures for Simulated Contamination of Test Versus Control Samples

5.4.1 Stainless steel materials coated with SLF 401

A 20 µl aliquot of the virus inoculum (containing 2 x 10^5 PFU) was transferred to each stainless steel sample coated with SLF 401 (with and without abrasion), and spread over it (by superimposing a clean glass cover slip), and subjected to exposure times of 10 and 30 minutes at room temperature. Controls were performed in a similar manner by adding 20 µl of virus inoculum (containing 2 x 10^5 PFU) to each uncoated stainless steel sample.

5.4.2 Virus recovery and plaque assay

Each inoculum was individually retrieved by the addition of 1 ml of serum-free DMEM, and thoroughly mixed before harvesting 100 µl of the retrieved sample for virus plaque reduction assay.

Each harvested sample was serially diluted (10-fold) up to 5 times, and inoculated into the pre-seeded H2.35 cells for virus plaque assay. Uninfected H2.35 cells (inoculated with serum-free DMEM) served as the control of cell culture viability. The plates were incubated for 3 days at 37 °C in an incubator with 5% CO_2.

The cells were stained with crystal violet to facilitate visualization of any plaques. Clear plaques (PFU) were counted based on the dilution well with <30 plaques. The viral titers were then back-calculated to account for the dilution factor.

5.5 Calculations

Viral titers were expressed as PFU per ml for infectivity. Clear plaques (PFU) were counted based on the dilution well with <30 PFU. For example, if 8 plaques were counted at a dilution factor of 10^4, then the actual virus titer would be 8 x 10^4 PFU per 100 µl (or 8 x 10^5 PFU per ml). Viral $\log_{10}$ reduction is measured by dividing the virus titer of the control model over the virus titer of the tested model, and then converted to $\log_{10}$ scale.

6. TEST ACCEPTANCE CRITERIA

The test was considered to be valid based on the following factors:

a) At least 1 × 10^4 PFU/ml of virus was recovered from the initial population in the untreated control;
b) Cells in control wells showed no virus plaque formation, and were attached to the bottom of the well;
c) Control and tested samples inoculated with only culture medium showed no virus recovery; and
d) The culture medium was free of “non-viral” contamination in all wells of the plate.

7. LIABILITY AND INDEMNIFICATION

The Testing Facility’s liability to the Study Sponsor under this Protocol shall be limited to the price of the evaluation. The Study Sponsor shall be responsible to Study Participants (when applicable) and to other third parties for the fitness and use of the product.

8. FINAL RESULTS

Below is the overall summary of the testing results.

The testing was considered to be valid, based on fulfilment of the test acceptance criteria outlined above.

Tested and control samples were initially inoculated with 2 x 10^5 PFU of MHV-A59. Virus recovery from the initial virus inoculum was more than 1 x 10^4 PFU per ml.

8.1 Coated Stainless Steel (Condition: 10 minutes contact time)

Virus titers of **test (coated steel without abrasion)** surfaces:

Replicate 1 = 0.00 PFU per ml Replicate 2 = 0.00 PFU per ml Replicate 3 = 0.00 PFU per ml Replicate 4 = 0.00 PFU per ml

Average = 0.00 PFU per ml

Virus titers of **test (coated steel with abrasion)** surfaces:

Replicate 1 = 0.00 PFU per ml Replicate 2 = 0.00 PFU per ml Replicate 3 = 0.00 PFU per ml Replicate 4 = 0.00 PFU per ml

Average = 0.00 PFU per ml

Virus titers of **control (uncoated steel)** surfaces:

Replicate 1 = 3.00 × 10^4 PFU per ml Replicate 2 = 1.05 × 10^4 PFU per ml Replicate 3 = 4.00 × 10^4 PFU per ml Replicate 4 = 2.50 × 10^4 PFU per ml

Average = 26,375 PFU per ml

Summary: With 10 minutes of contact time, there was at least a 4.4 $\log_{10}$ reduction (26,375-fold) in viral titer with the application of SLF 401 coating (without and with abrasion) – with respect to the control.

Statistical analysis: Using Tukey's multiple comparisons test, the difference was statistically significant with a P-value of 0.0014 (without and with abrasion).

8.2 Coated Stainless Steel (Condition: 30 minutes contact time)

Virus titers of **test (coated steel without abrasion)** surfaces:

Replicate 1 = 0.00 PFU per ml Replicate 2 = 0.00 PFU per ml Replicate 3 = 0.00 PFU per ml Replicate 4 = 0.00 PFU per ml

Average = 0.00 PFU per ml

Virus titers of **test (coated steel with abrasion)** surfaces:

Replicate 1 = 0.00 PFU per ml Replicate 2 = 0.00 PFU per ml Replicate 3 = 0.00 PFU per ml Replicate 4 = 0.00 PFU per ml

Average = 0.00 PFU per ml

Virus titers of **control (uncoated steel)** surfaces:

Replicate 1 = 9.00×10^3 PFU per ml Replicate 2 = 9.50×10^3 PFU per ml Replicate 3 = 9.50×10^3 PFU per ml Replicate 4 = 1.00×10^4 PFU per ml

Average = 9,500 PFU per ml

Summary: With 30 minutes of contact time, there was about 4.0 $\log_{10}$ reduction (9,500-fold) in viral titer with the application of SLF 401 coating (without and with abrasion) – with respect to the control.

Statistical analysis: Using Tukey's multiple comparisons test, the difference was statistically significant with a P-value of 0.0014 (without and with abrasion).

9. SUMMARY

In summary, there was a significant decrease of 4.4 and ~4 log10 reduction in viral titer with the application of the tested SLF 401 coating on stainless steel surfaces (without and with abrasion) for 10 minutes and 30 minutes of contact time, respectively. These reductions corresponded to the coating inactivating the coronavirus whose titers were reduced by a factor of 26,375 and 9,500 respectively.