BioSpectrum
the business of Bio & Health Sciences
ASIA EDITION

Israel develops anti-coronavirus surface coating

May 6, 2020 | News

The novel surface coatings contain nanoparticles of anti-viral and anti-bacterial metal ions and polymers



The coronavirus, SARS-CoV-2, which is responsible for the current COVID-19 pandemic, is transmitted between people mainly via respiratory droplets, but it is known that the virus remains stable on various surfaces for days. One of the first indications for this came from the Diamond Princess cruise ship, where active virus particles were found even 17 days after the ship was evacuated. In light of the possibility that the virus can spread through contaminated surfaces, it is important to be able to sterilize surfaces with high contamination potential, such as doorknobs, elevator buttons or handrails in public areas in general, and in hospitals and clinics in particular. However, current disinfectants are mainly based on chemicals such as poisonous sodium hypochlorite (bleach) or alcohol, both of which provide only a temporary measure until the next exposure to the virus.

Prof. Angel Porgador, from the Department of Microbiology, Immunology and Genetics at Ben-Gurion University (BGU), Israel and the National Institute of Biotechnology in the Negev (NIBN), and Dr. Mark Schvartzman, the Department of Materials Engineering at BGU, are developing novel surface coatings that will have a long term effect, and contain nanoparticles of safe metal ions and polymers with anti-viral and anti-microbial activity.

Certain metals can be lethal, even in small quantities, for viruses and bacteria and are not poisonous to humans. In proof of concept experiments, in which also PhD students Yariv Greenshpan and Esti Toledo, and postdoc Guillaume Le Saux participated, the researchers assessed the effect of surfaces coated with nanoparticles of various metals on the infectivity of lentiviruses, which belong to the HIV family, in human cells. Findings show that surfaces coated with copper nanoparticles strongly block infection of the cells by the virus. These ongoing experiments show a huge potential for copper ions in preventing surface-mediated infection with SARS-CoV-2.

Based on these findings, the researchers are developing anti-viral coatings that can be painted or sprayed on surfaces. The coatings are based on polymers, which are the starting materials of plastics and paints, and contain nanoparticles of copper and other metals. The nanoparticles embedded in the polymer will enable controlled release of metal ions onto the coated surface. Studies show that these ions have a strong anti-viral effect, which can eradicate virus particles that adhere to the surface. Because the release of ions is extremely slow, the coating can be effective for a long period of time – weeks and

even months, and it will reduce the infectivity of the virus particles by more than 10-fold.