

Why Governments are advocating soap and water as a primary defence in the fight against COVID-19

General Cleaning Products

You should continue cleaning with InnuScience's biotechnological products as usual. It is important to ensure that surfaces are cleaned thoroughly on a regular basis, as early reports suggest that coronavirus may stay active on surfaces for many hours, depending on the type of surface, moisture, sunlight and heat.

Effective, rigorous cleaning should be performed more often than usual, as surfaces can easily be contaminated if touched by someone who is harbouring the virus on their hands; the original clean or disinfection will then be rendered meaningless. Here's the why:

Soap-based Products

Viruses, such as coronavirus, consist of three main 'building blocks'; ribonucleic acid (RNA); the viral genetic material similar to DNA, proteins, and lipids; the outer coating of the virus that protects the genetic material and aids with viral spread and cellular invasion. These three components spontaneously self-assemble to form a complete virus, with weak 'non-covalent' bonds between the proteins, RNA and lipids. Viruses work by invading a cell and using the cellular machinery to force the cell to replicate the viral RNA and viral proteins, which then rebuild into new viruses. This accumulation of viruses eventually causes the cell to die or burst, releasing the viruses to then infect more cells.

The current health advice for washing hands with soap and water is based on the ability of soap molecules to interfere with lipids in the virus membrane, breaking down the outer fat (lipid) layer of the virus. Moreover, the soap molecules can compete with the other non-covalent bonds between the proteins, RNA and lipids, effectively 'dissolving' the glue that holds the virus together. The soap can also disrupt the interactions between the virus and the skin surface, removing viruses from the skin.

This is all due to the 'amphiphilic' nature of soap molecule. Each molecule has a hydrophilic ('water-loving') head and a hydrophobic ('water-hating') tail. Viruses are surrounded by a 'lipid bilayer', made up of two bands of hydrophobic tails sandwiched between two rings of hydrophilic heads. When exposed to soap and water, viruses are prised apart, as the hydrophobic tails of the soap molecules attempt to escape from water and wedge themselves into the lipid envelopes of the virus, rupturing the viral membrane.

Therefore, although InnuScience cleaning products are not specifically virucidal, they do possess this amphiphilic ability, similar to soap, which works by dissolving the fat membrane that surrounds the virus, rendering the virus inactive on all freshly cleaned surfaces.

Disinfectant Products

Disinfectants should be used for spot treating door handles and other high-touch surfaces.

Alcohol-based Hand Sanitizers

Ethanol and other types of alcohol are solvents and are therefore more lipophilic ('fat loving') than water. This means that alcohol does dissolve the lipid membrane and disrupt the virus. However, a high concentration of alcohol ($\geq 60\%$) is required. These hand sanitizers are useful when soap and water are not available. This is why soap and water remain the 'gold standard', as the virus detaches from the skin and falls apart readily in soapy water.