The history of soap and how it destroys corona virus

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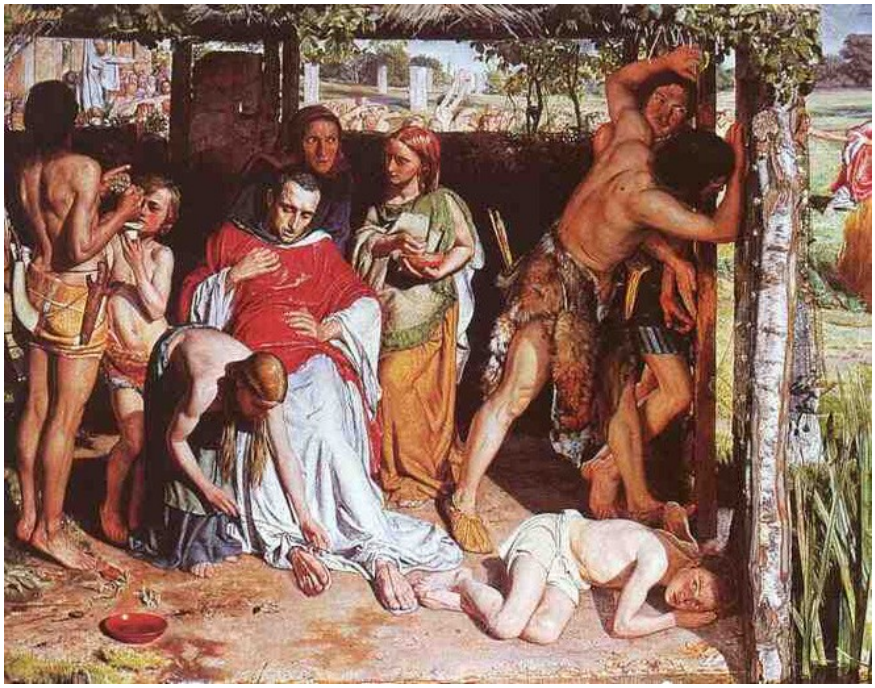
Legend has it that a rainfall that struck the Earth thousands of years ago swept away the fat and ashes of the sacrificed creatures. When this mixture drifted down a nearby river, they mixed together and formed sparkling bubbles that could wash away skin and clothes.

Soap emerged from there, becoming an innovation that changed human history.

But perhaps, our own ancestors at that time could hardly imagine that these fragile, sparkling bubbles of all colors became a powerful weapon to help people fight germs. Invisible disease in the future.

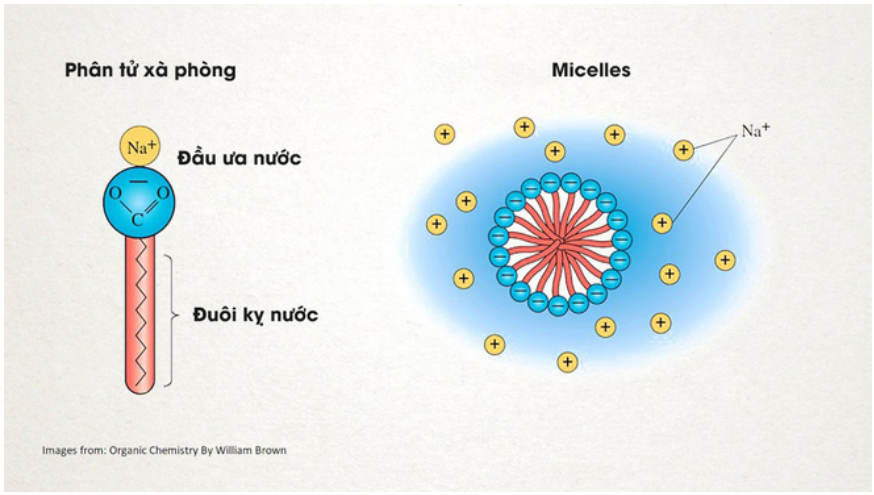


For humans, soap often evokes a soothing and soothing feeling. But in the world of microorganisms, soap molecules are really a murderous and rabid man. A drop of soap is often diluted in water is enough to destroy many types of bacteria and viruses, including the new corona that is causing the Covid-19 epidemic today.

The secret of soap is in the same way that it came from ash and grease.

When you look at the chemical nature of soap, you see that it has two parts. One is the hydrophilic, basal-containing molecule. The rest is the tail of the long hydrophobic fatty acid chain. Bases (found in ash) combined with fatty acids (found in fats) in a reaction called saponification.

As its name suggests, the hydrophilic head of soap prefers to adhere to water molecules. While, hydrophobic tails will avoid water and prefer to stick to oil or fat. Soap molecules, when suspended in water, will gather together, turn our hydrophilic heads outside and touch the hydrophobic tails into a small ball called the micelles.



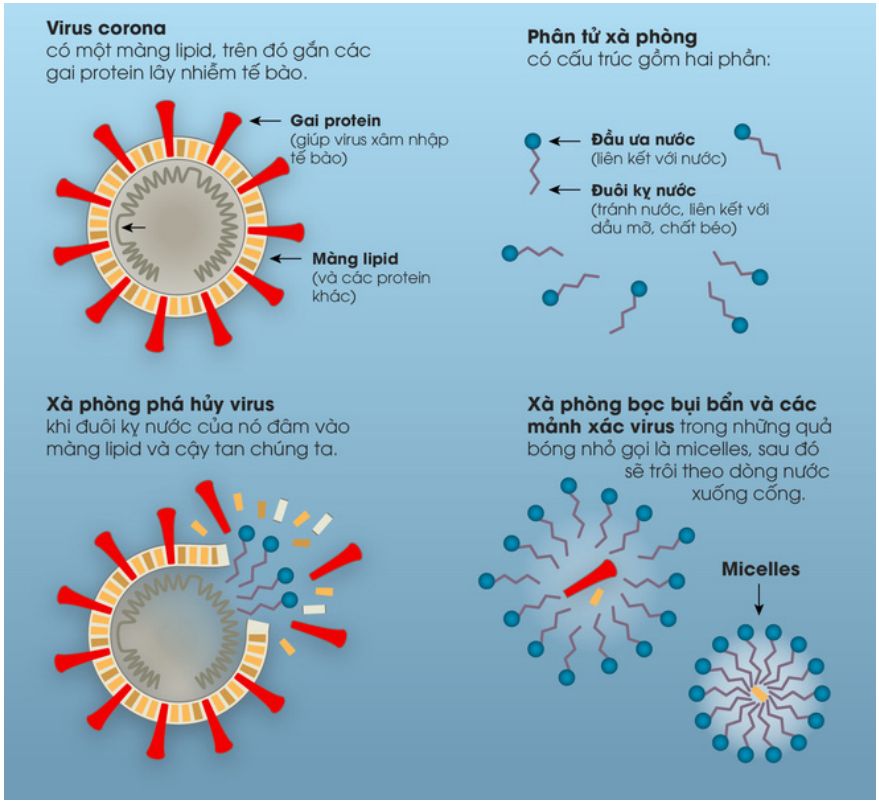
Some bacteria and viruses have lipid membranes that look like double layer micelles. They have two hydrophobic tail bands sandwiched between the hydrophilic ends. These membranes support important proteins

to attach to their surfaces, allowing the virus to invade cells and cause disease.

Pathogens wrapped in lipid membranes include corona virus, HIV, hepatitis B and C virus strains, herpes, Ebola, Zika, dengue fever and many bacteria that attack the intestine and respiratory tract.

When you wash your hands with soap and water, you are attacking viruses and bacteria with soap particles. The hydrophobic tails of the soap will try to evade the water molecule. And in the process, they will stab into bacterial or viral lipid membranes, and then separate them.

Professor Pall Thordarson, Head of the Department of Chemistry at the University of New South Wales, said: " *Soap molecules act like crowbar, destabilizing the entire system [the outer membrane of the pathogen]* ". The lipid membranes are knocked out by the levers of the soap molecule, releasing their essential proteins and the bacteria will die.



Whereas with viruses like corona, soap molecules turn on the lipid membrane, where they attach infectious thorns to themselves. When corona's thorns are shed, they will no longer be able to infect human cells. The virus is then called inactivated.

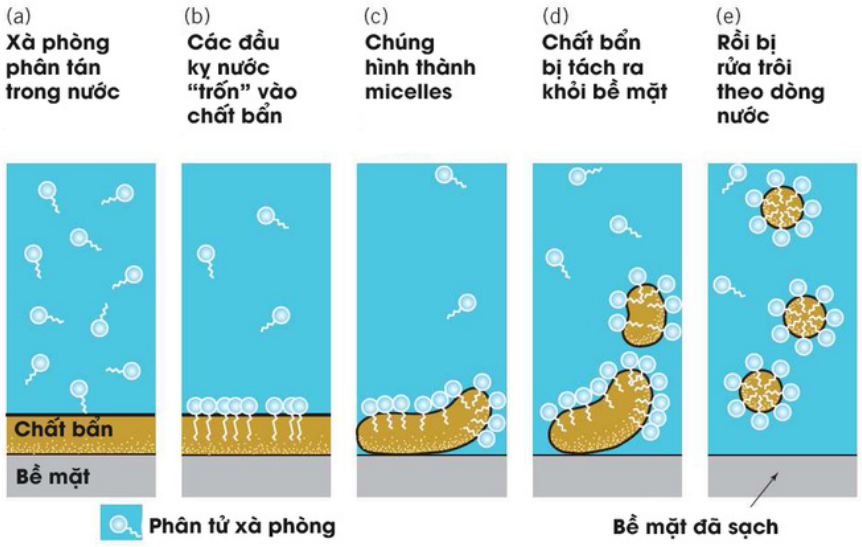
Simultaneously with this destruction process, some soap molecules will break down the chemical bonds that allow bacteria, viruses and dirt to adhere to the surface of the skin, relieving them from your hands.

Micelles can also form around dirt particles and virus and bacterial fragments, wrapping them in floating cages. So when you flush, all microorganisms that have been destroyed, trapped or inactivated will flow down the drain.

In general, dry hand sanitizers are not as reliable as soap. Although over 60% alcohol can act similarly to soap to destroy and destabilize bacterial or viral lipid membranes, they cannot form micelles that help remove microorganisms from the skin.

In addition, there are many strains of viruses that do not contain lipid membranes, as well as bacteria that have an outer protein shield. These pathogens include bacteria that cause meningitis, pneumonia, diarrhea and skin infections, as well as hepatitis A virus, polio, rhinoviruses and adenovirus (causing common colds) that cannot be killed or killed. Activated with an alcohol-based dry hand wash.

Pathogens that are highly resistant to soap, even if not killed, will be washed away when you rub your hands well. That's why washing your hands with soap and water is generally recommended as a better hygiene method than using dry hand sanitizer.



From the ashes and fat of sacrificed creatures drifting down a nearby river, to the age of gene therapy and surgical robots, the formula of soap basically hasn't changed. Soap remains effective after thousands of years, unlike antibiotics that will be resistant to bacteria only every few years.

Throughout history, soap has been one of the most valuable medical interventions we have ever had. Washing hands with soap and water is also one of the public health measures to significantly reduce pandemic rates and limit the number of infections, prevent overcrowding in hospitals and clinics.

But this method only works if people wash their hands regularly and thoroughly: Apply soap all over the palm of your hand, rub for at least 20 seconds, to all fingers, fingers, fingers, backs of hands, palms and nail crevices .

In the raging Covid-19 pandemic, soap was not only a weapon to protect yourself from germs, but also an important public health measure to create a common safety net. for the whole society.

If everyone washed their hands frequently, there would be fewer patients with Covid-19. The disease will therefore spread more slowly, more people will be protected.

As you can see, on the molecular level, soap works by breaking things up, but at the social level, it helps keep things together.

Remember this the next time you wash your hands: because someone else's life may be in your own hands.

Refer to *Nytimes*