

Center for Science Outreach

Adjusting to Coronavirus

We've seen huge changes in daily life over the past week. No school, no running around with friends and LOTS of talk of the virus at the heart of all these changes. We know this is a hard time for everyone. Even though we can't meet in person, over the next several weeks, we want to provide you with some information that might help you understand what is going on and then to continue your discovery of science at home!

What is with social distancing?

No hand-shakes or hugs, staying at least 6ft from the next person in line at the grocery store, and now we are being asked not to leave our homes except for essential matters. What is all this about? Watch how quickly germs can spread with every day contact in the video below. Social distancing, which means limiting physical contact providing lots of personal space (6-10 feet), is an effective way to limit the spread of disease causing germs.



[How germs spread video](#)

The Importance of Handwashing

The video linked to the right, while amusing and adorable, serves as only an allegory for why handwashing is so effective in eliminating pathogens from our hands. The video does show the powerful property of soap that is at least in part responsible for its antimicrobial activity. So, how does it work?



[The Power of Soap Video](#)



We are all hearing lots of new terms on the news and talking with our families. Click on the link below to access a quizlet we set up to help you understand some of the terminology that may be new to you.

[DoD Quizlet](#)

When you go to the link click on the "Viruses" quizlet set near the bottom of the page. You should be able to access the 15 vocabulary words but you may want to set up a free account.

How Well Do You Wash Your Hands?

Watch the video below to see how effective you are at hand washing.



[Handwashing Experiment Video](#)

How Soap Works

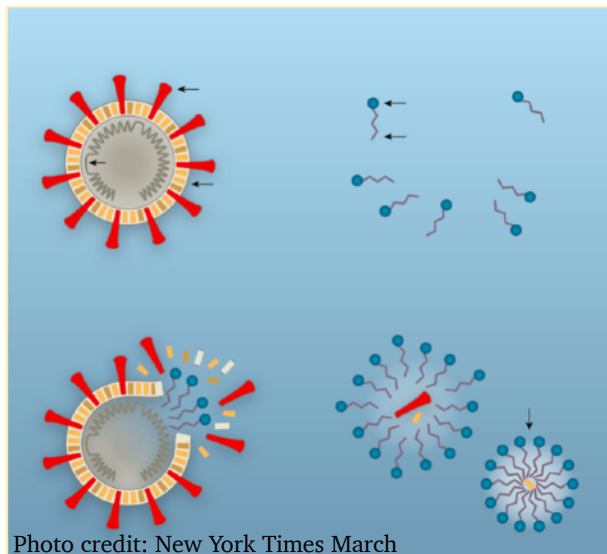


Photo credit: New York Times March

Soap is composed of fatty acids. These are chemicals with a hydrophilic (water loving) polar end and a longer hydrophobic non polar (water-fearing) end. The unique structure of soaps causes the molecules to insert within the lipid (organic oil)-rich membrane of the virus (including Coronavirus). Once inserted, the membrane is destabilized, preventing the virus from infecting another cell. The fatty acid molecules in soaps also arrange in a spherical shape as shown below called micelles. These structures isolate components of the virus from the parent structure.

- ♦ The red spikes are proteins within the viral envelope.
- ♦ The yellow and brown rectangles represent the lipid layer of the virus
- ♦ The soap is shown in blue with the circular hydrophilic and gray branched hydrophobic portion

Soaps in general are effective in inactivating pathogens like bacteria and viruses. Hand washing also involves copious amounts of water which rinses and dilutes pathogens on the hands, further reducing infectivity. Alcohol based hand sanitizers work via similar mechanisms of membrane destabilization although are not as effective as soaps.



Coronaviruses are a type of virus that is covered in a fatty membrane called a viral envelope. The hydrophobic part of the soap is attracted to the membrane and causes it to burst so it can't infect cells.

[How Soap Destroys Corona Virus Video](#)

This understanding that washing hands can prevent disease is a relatively new discovery. Want to learn more about how who figured that out (and about the google doodle from a couple of days ago)? Click on the video to to the right.



[Ignaz Semmelweis Video](#)