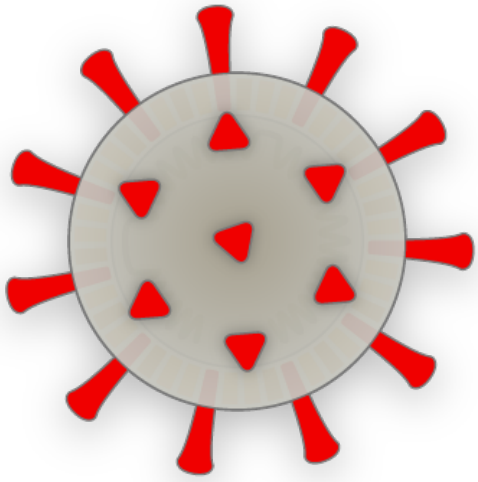
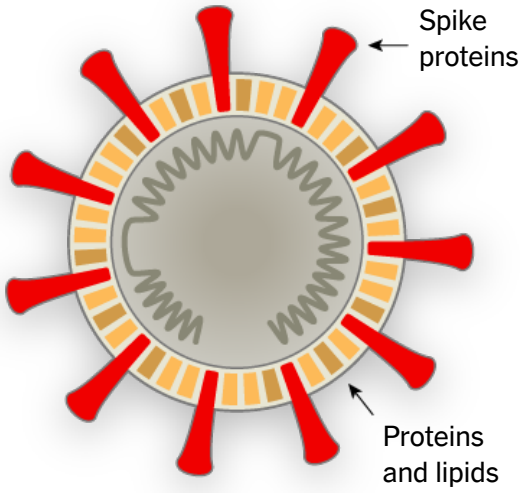
How Coronavirus Hijacks Your Cells

By Jonathan Corum and Carl Zimmer March 11, 2020



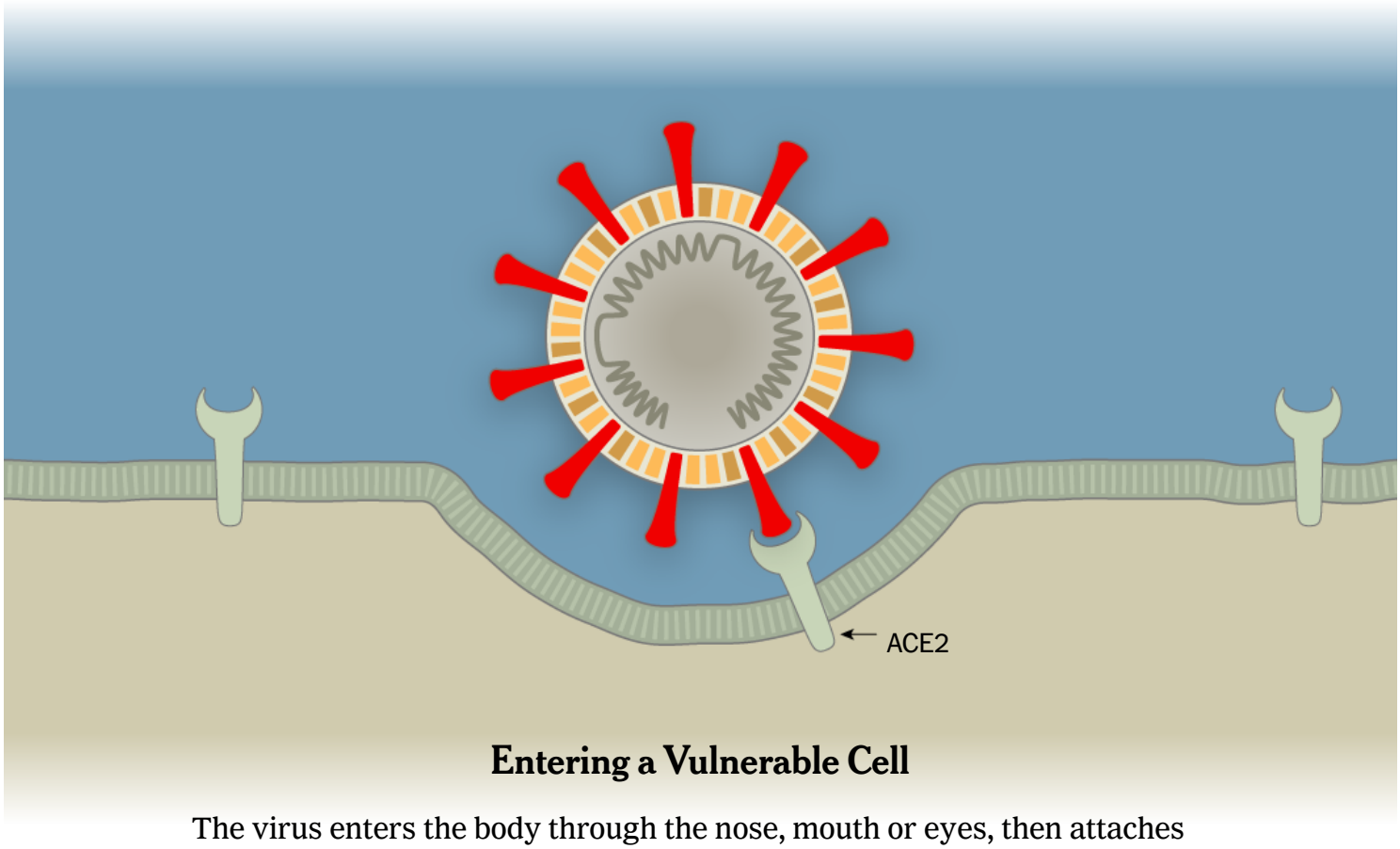
The SARS-CoV-2 Coronavirus

The virus that causes Covid-19 is currently spreading around the world. At least six other types of coronavirus are known to infect humans, with some causing the common cold and two causing epidemics: SARS in 2002 and MERS in 2012.



Covered With Spikes

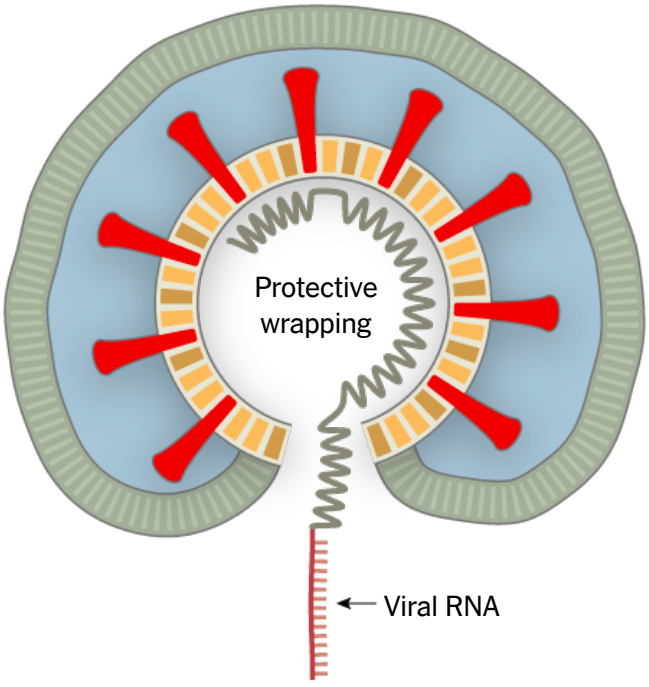
The coronavirus is named after the crownlike spikes that protrude from its surface. The virus is enveloped in a bubble of oily lipid molecules, which falls apart on contact with soap.



Entering a Vulnerable Cell

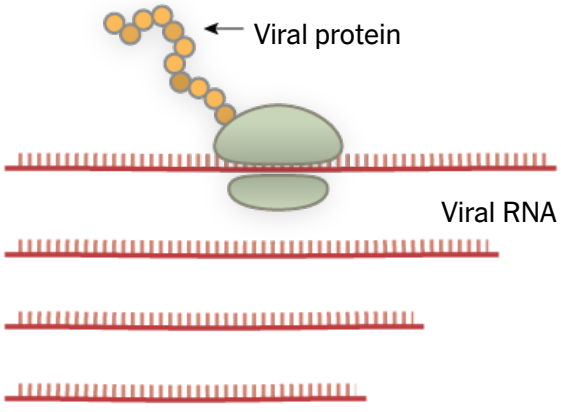
The virus enters the body through the nose, mouth or eyes, then attaches to cells in the airways that produce a protein called ACE2. The virus is believed to have originated in bats, where it may have attached to a

similar protein.



Releasing Viral RNA

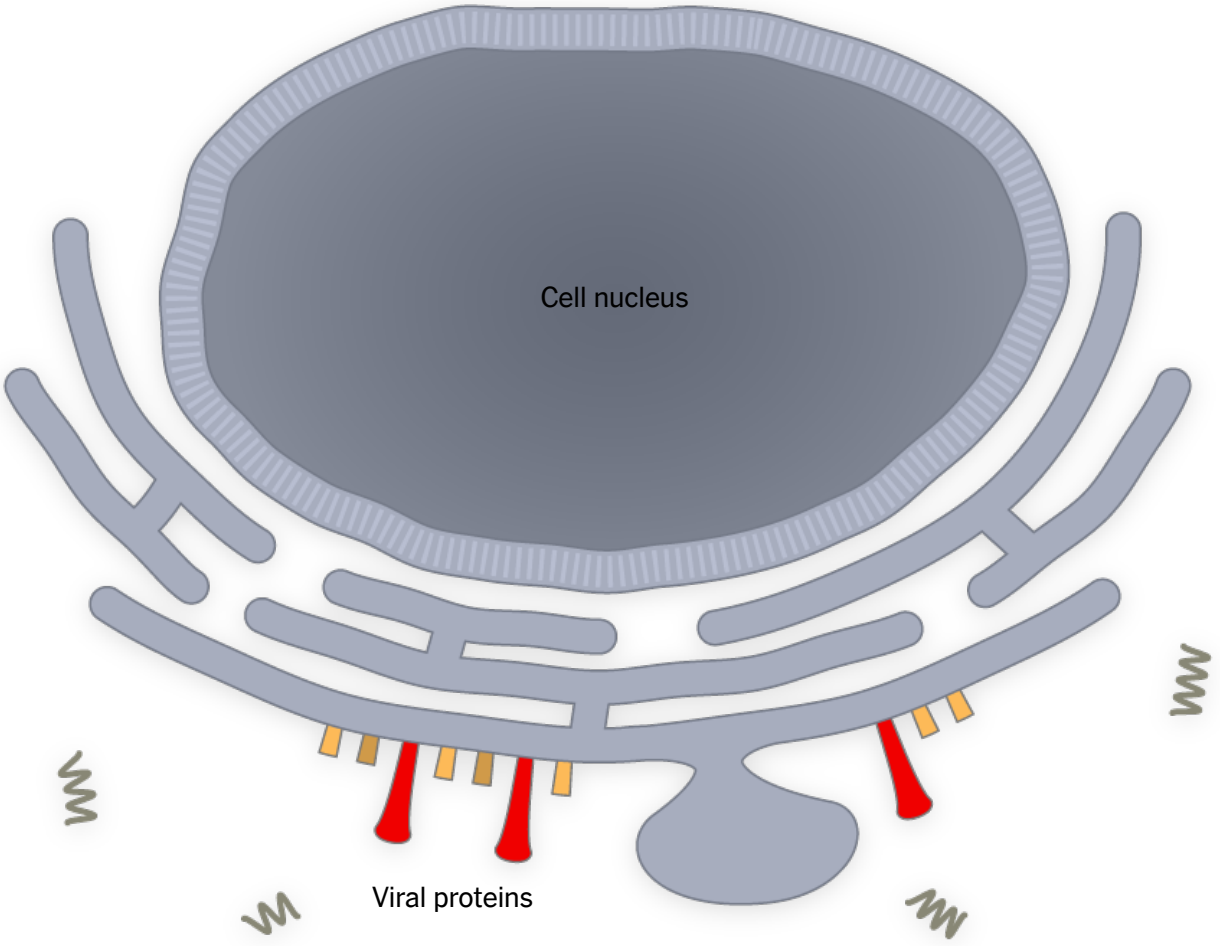
The virus infects the cell by fusing its oily membrane with the membrane of the cell. Once inside, the coronavirus releases a snippet of genetic material called RNA.



Hijacking the Cell

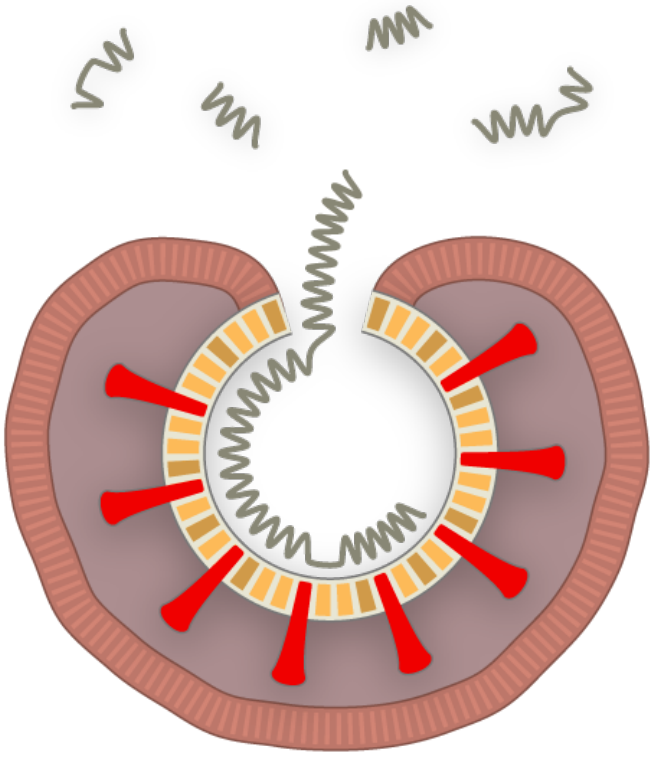
The virus's genome is less than 30,000 genetic "letters" long. (Ours is over 3 billion.) The infected cell reads the RNA and begins making proteins that will keep the immune system at bay and help assemble new copies of the virus.

Antibiotics kill bacteria and do not work against viruses. But researchers are testing antiviral drugs that might disrupt viral proteins and stop the infection.



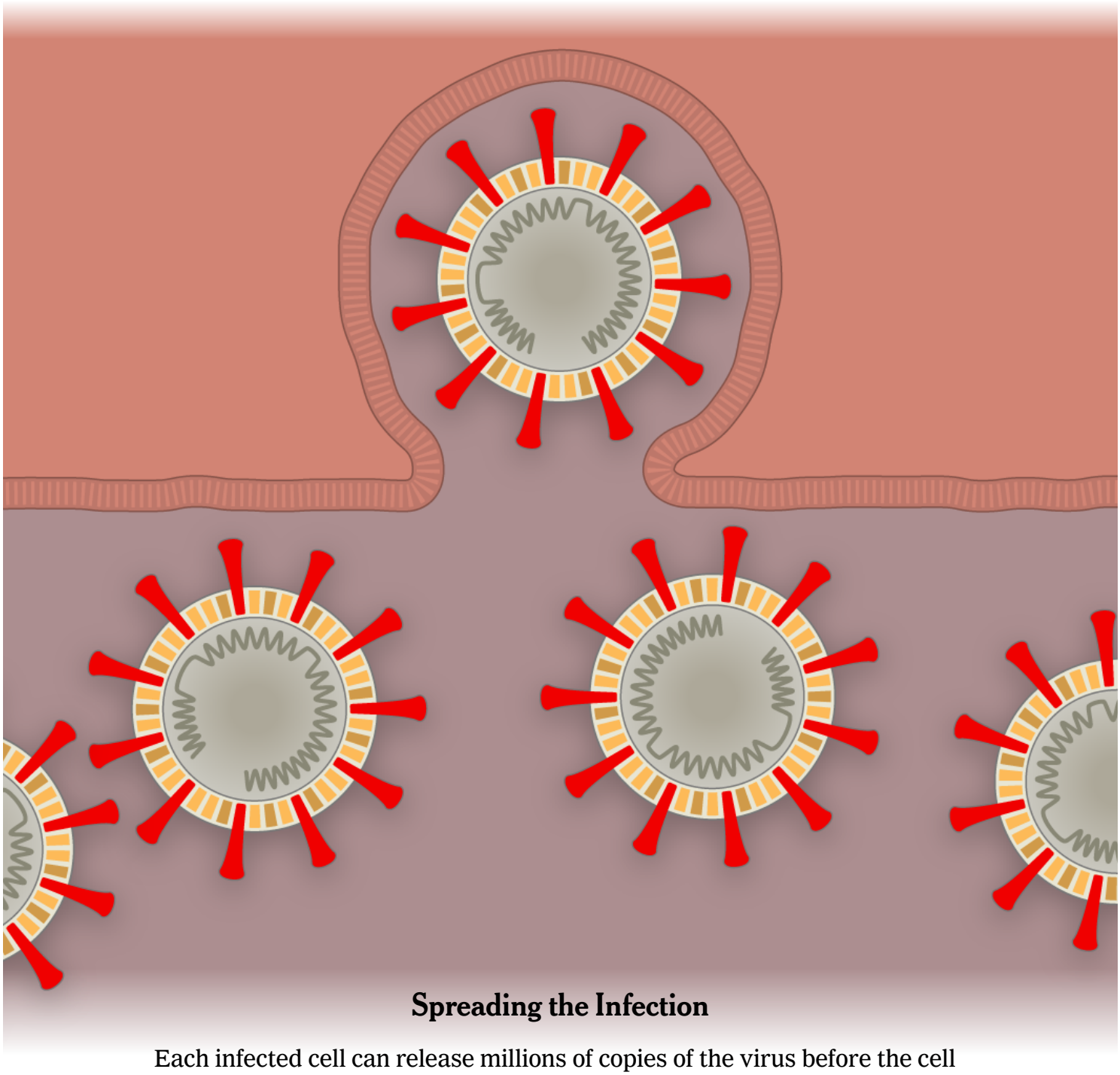
Making Viral Proteins

As the infection progresses, the machinery of the cell begins to churn out new spikes and other proteins that will form more copies of the coronavirus.



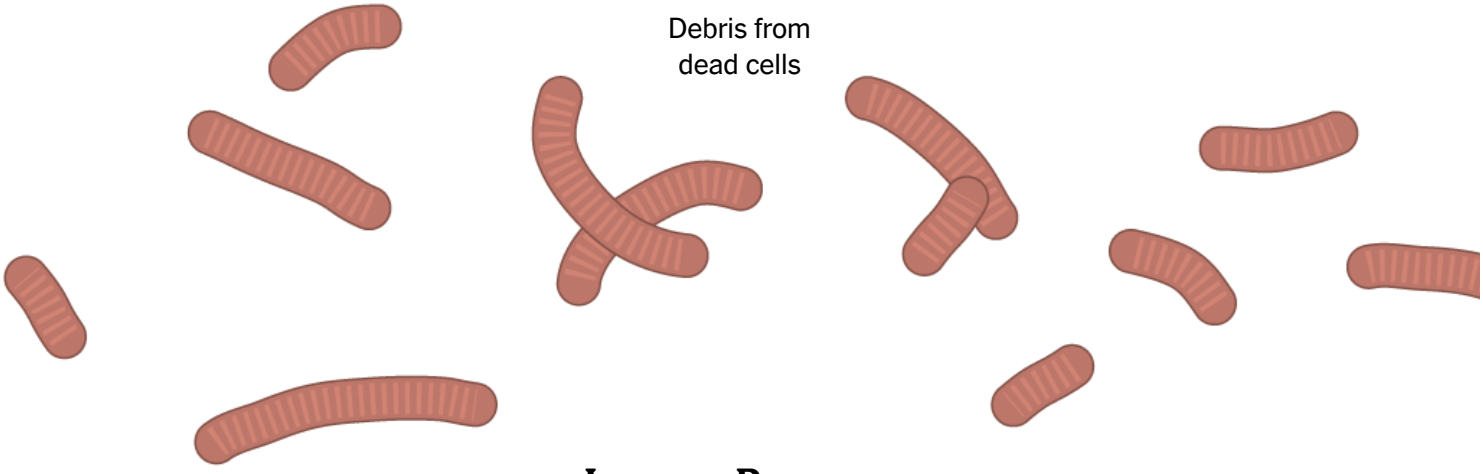
Assembling New Copies

New copies of the virus are assembled and carried to the outer edges of the cell.



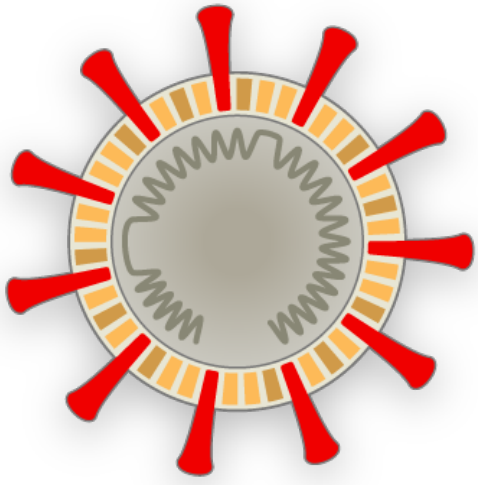
Spreading the Infection

Each infected cell can release millions of copies of the virus before the cell finally breaks down and dies. The viruses may infect nearby cells, or end up in droplets that escape the lungs.



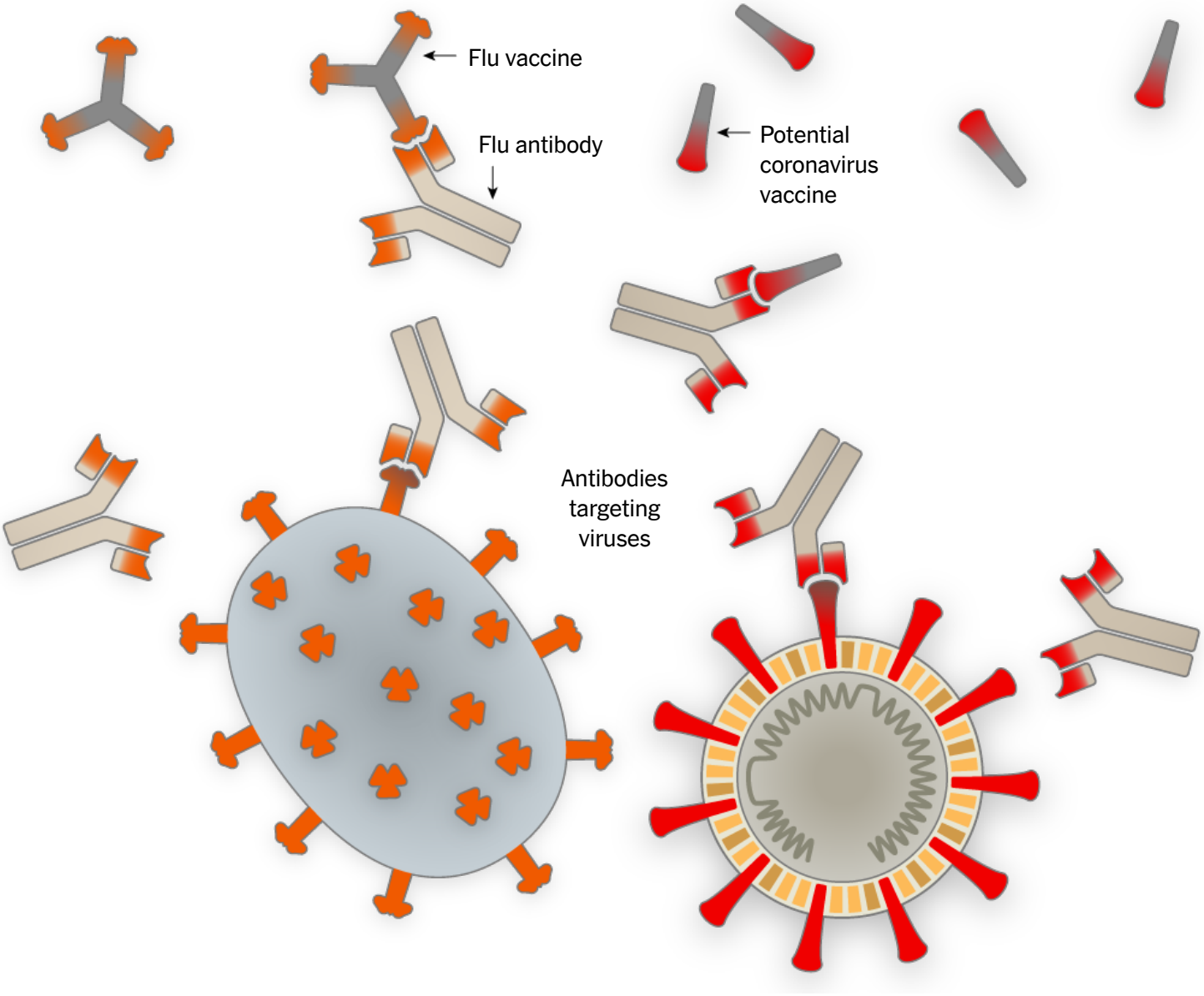
Immune Response

Most Covid-19 infections cause a fever as the immune system fights to clear the virus. In severe cases, the immune system can overreact and start attacking lung cells. The lungs become obstructed with fluid and dying cells, making it difficult to breathe. A small percentage of infections can lead to acute respiratory distress syndrome, and possibly death.



Leaving the Body

Coughing and sneezing can expel virus-laden droplets onto nearby people and surfaces, where the virus can remain infectious for several hours to several days. Infected people can avoid spreading the virus by wearing a mask, but healthy people do not need to wear a mask unless they are caring for a sick person.



A Possible Vaccine

A future vaccine could help the body produce antibodies that target the SARS-CoV-2 virus and prevent it from infecting human cells. The flu vaccine works in a similar way, but antibodies generated from a flu vaccine do not protect against coronavirus.

The best way to avoid getting infected with the coronavirus and other viruses is to wash your hands with soap, avoid touching your face, keep your distance from sick people and regularly clean frequently used surfaces.

Sources: Dr. Matthew B. Frieman and Dr. Stuart Weston, Univ. of Maryland School of Medicine; Fields Virology; Fenner and White's Medical Virology; Nature; Science; The Lancet; New England Journal of Medicine; Centers for Disease Control and Prevention.