

Infographic: How COVID-19 invades the body, step by step

The newest coronavirus, SARS-CoV-2, has created a far deadlier pandemic in part because once it infects a person it can lie undetected for a long time. An individual who had the SARS coronavirus did not transmit it until 24 to 36 hours after displaying symptoms such as fever and dry cough; people feeling ill could be isolated before they made others sick. But people with COVID-19 can transmit the virus before they show clear symptoms. Not feeling ill, infected men and women work, commute, shop, eat out and attend parties, all the while exhaling coronavirus into the airspace of people around them. The virus can remain undetected inside the human body for so long partly because its genome produces proteins that delay our immune system from sounding an alarm. Meanwhile lung cells die as the virus secretly reproduces. When the immune system does hear the call, it can go into overdrive, suffocating the very cells it is trying to save.

In the graphics that follow, Scientific American presents detailed explanations, current as of mid-June, into how SARS-CoV-2 sneaks inside human cells, makes copies of itself and bursts out to infiltrate many more cells, widening infection. We show how the immune system would normally attempt to neutralize virus particles and how CoV-2 can block that effort.

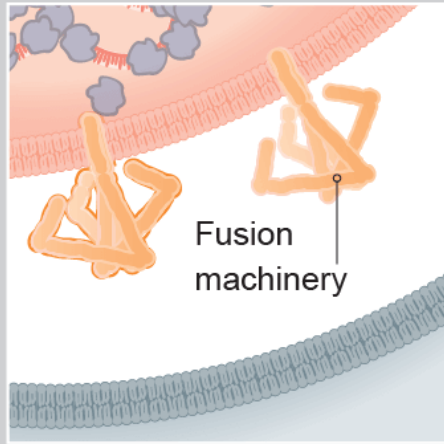
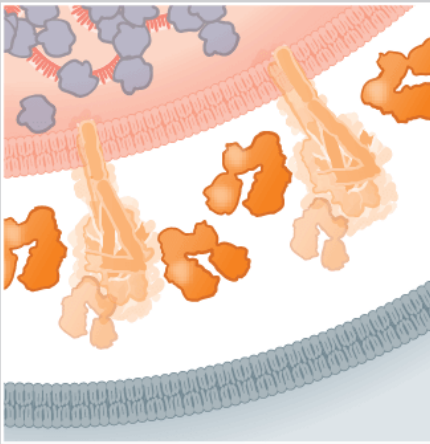
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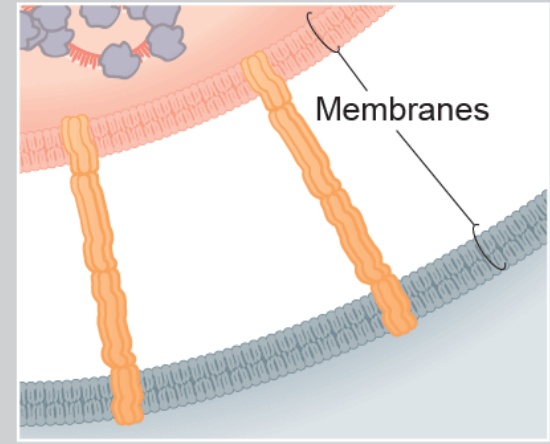
2 SLIP INSIDE

The virus and lung-cell membranes fuse, allowing the virus's RNA—a molecule that encodes the genome (genetic instructions)—to pour into the cell's body.

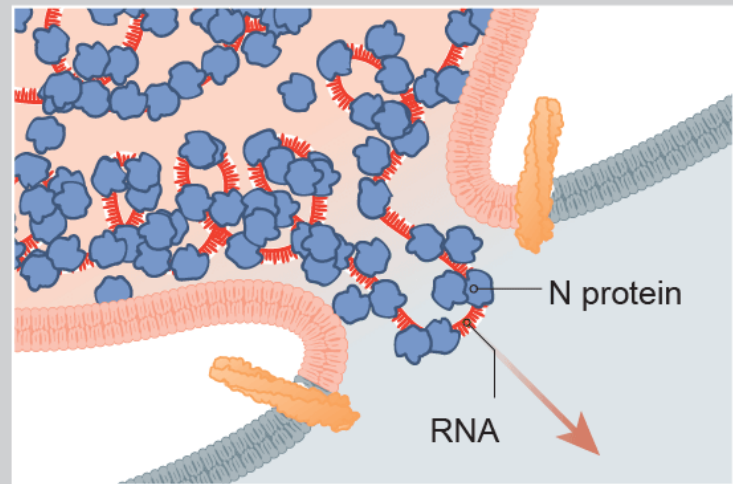
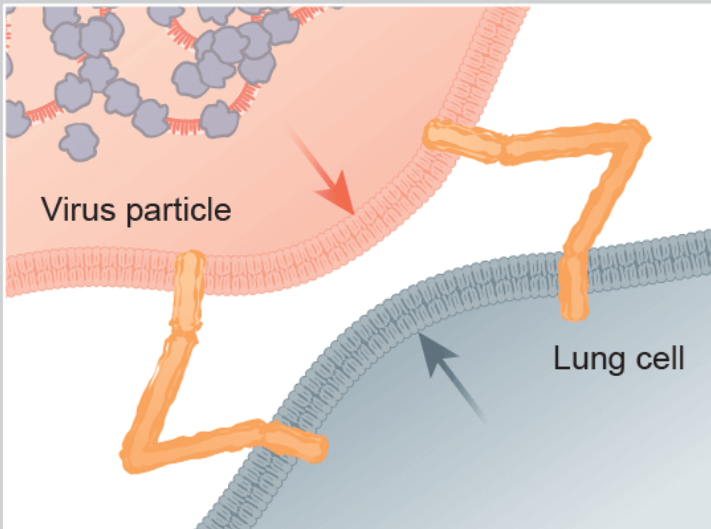
Spike decapitation allows the fusion machinery to unfold.



The machinery inserts itself into the cell membrane ...



... and pinches the membranes together.



A channel forms, allowing N proteins and RNA to enter the lung cell.

TIME ELAPSED: ABOUT 10 MINUTES

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