

## Is a New Virus Causing SARS?

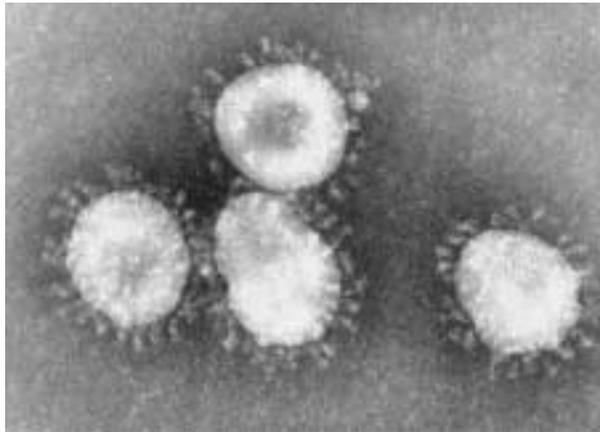
The Centers for Disease Control is cautiously reporting that it believes the current SARS outbreak is caused by a previously unknown type of coronavirus. This surprised many scientists, because the two types of coronavirus that are known to infect humans are not deadly, and include the virus responsible for many of the infections known as the “common cold.” However, other laboratories around the world have reported the presence of other viruses in SARS patients, including paramyxovirus and metapneumovirus.

The CDC is basing its hypothesis, that the coronavirus is the causative agent, on several pieces of laboratory and clinical evidence. The CDC laboratory was able to culture the new coronavirus from lung tissue samples taken from a small group of SARS patients. Once cultured, DNA analysis showed that the virus was related to the coronavirus family; but it was unlike any other human or animal coronavirus. Electron microscopy also confirmed the new virus had typical coronavirus structures.

From this work, it was possible to identify an antibody response to the virus, which is now being used as a diagnostic test. This antibody test works only in patients in the later stages of infection.

A diagnostic test for the presence of viral DNA has now also been developed, which can detect the presence of the virus in the early stage of an infection. Bolstering the CDC’s assertion that the coronavirus is the cause of SARS, research from Hong Kong showed that this virus was detected in 45 of 50 SARS patients there.

The origin of the virus is also a mystery, as it is so different from other known coronavirus types, that some scientists have proposed it may be a virus from another species, that has mutated and acquired the ability to make a species “jump” and infect humans.



*Coronaviruses are named for their crown-like appearance. A new or mutated variety, possibly related to coronaviruses which infect animals, may be causing Severe Acute Respiratory Syndrome (SARS), although the evidence is still developing as the global outbreak spreads.*

The virus seems to be able to spread in droplets from coughing, sneezing, and other fluids from infected people. It also is likely that the virus can survive for a brief period on moist surfaces, as other coronaviruses have this ability. It is not known if the virus can be transmitted by any insect vectors, or if it can be spread through water systems or ventilation systems. Scientists are investigating the possibility of some other type of spread of the virus in the Hong Kong outbreak in an apartment complex, where 280 people became infected. At present, they are investigating the possibility of cockroaches mechanically transmitting the virus from one surface to another, or to food that people would come into contact with, but so far, no evidence proving this has been found.

There have been over 100 deaths worldwide due to SARS, but in most cases the patient recovers fully. It is unclear if the development of severe respiratory symptoms in some SARS victims requires a co-factor, or the presence of a second virus. This is actively being investigated by teams in Asia, Canada, and the United States. So far, in the United States, there have been 149 cases of SARS, but none of the patients has died.—*Colin Lowry*