

At the NIID, the struggle to overcome the global crisis is ongoing.

UPDATE >>>

# Japan's Contribution: Breakthrough in Isolating the Novel Coronavirus

The novel coronavirus (COVID-19), which originated in China, is spreading across the world. We spoke with Dr. WAKITA Takaji, the director-general of Japan's National Institute of Infectious Diseases (NIID), an authority of infectious diseases that was the first to successfully cultivate infectious virus particles for the hepatitis C virus (HCV).

**S**ARS-CoV-2, the novel coronavirus first seen in Wuhan, a city in China's Hubei Province, near the end of 2019, has quickly spread worldwide. On January 30, the World Health Organization (WHO), a United Nations agency concerned with healthcare, declared its sixth-ever Public Health Emergency of International Concern.

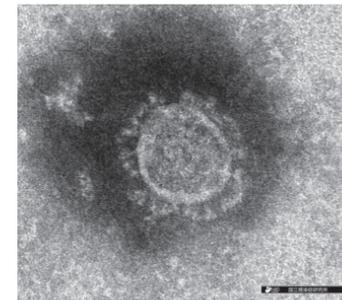
As NIID director-general WAKITA Takaji explains, "Coronaviruses are widespread in nature. So far six types that can infect humans have been verified, four of which cause the common cold, while the other two are known as SARS and MERS, which induce severe pneumonia. The newly discovered coronavirus, SARS-CoV-2, is the seventh variety. Compared to SARS

and MERS, SARS-CoV-2 is less severe. However, experts have pointed out that while SARS and MERS generally can only be contracted from patients exhibiting symptoms, SARS-CoV-2 may be contracted from patients in the incubation phase, which means that they have not yet developed symptoms. This means that stopping the spread of the virus is a number one concern."

NIID director-general WAKITA Takaji talks about Japan's efforts to combat the novel coronavirus.



An electron microscope image of the novel coronavirus isolated at the NIID.



On January 31, the NIID succeeded in isolating the virus. The isolated virus was provided without compensation to the Global Health Security Agenda network, whose members include the United States, the United Kingdom, and France. The NIID is also ready to distribute the isolated virus widely throughout the world. It is expected to facilitate the development of SARS-CoV-2 test reagents and vaccines. WHO Assistant director-general Dr. YAMAMOTO Naoko says, "The NIID succeeded in isolating the virus, and has provided the isolated virus upon request without charge to a wide range of research institutes across the globe. I expect that it will help promote research and development around the world, while also making a major

contribution toward better methods of diagnosis, the development of vaccines and treatments, and a full understanding of the virus." Meanwhile, many researchers and medical professionals are working together at WHO to find a breakthrough in combating SARS-CoV-2. These include professionals from Japan, such as Dr. KASAI Takeshi, WHO Regional Director for the Western Pacific, and Dr. KIDA Hiroshi, a professor at Hokkaido University and an expert on zoonosis, which is the transmission of communicable diseases from animals to humans.

Director-general Wakita goes on to point out, "In a case like this, prompt diagnosis and healthcare system readiness are extremely important."

The NIID is partnering with Eiken Chemical Co., LTD., and Canon Medical Systems Corporation to develop an inspection system for testing COVID-19 patients by using loop-mediated isothermal amplification (LAMP), a proprietary technique of Eiken Chemical that was employed during the 2003 SARS outbreak. LAMP differs from the polymerase chain reaction (PCR) method: this method amplifies the nucleic acids needed for diagnosing an infectious disease in a short time and without the use of complex equipment. If they can develop a fast test kit with LAMP, it could enable prompt and inexpensive testing in Japan and the rest of the world.

In addition, Kyorin Pharmaceutical Co., Ltd. is developing a method for performing tests in as little as 15 minutes or so. This method would utilize devices and technology invented by a venture that was spun out of the National Institute of Advanced Industrial Science and Technology (AIST). Another company, Hilltop, a regional enterprise based in Uji, Kyoto Prefecture is providing various forms of support to the effort to develop the technology. These efforts illustrate Japan's nationwide drive in which diverse organizations are working hard to find a breakthrough.\*



WHO Assistant director-general Dr. YAMAMOTO Naoko expects that the NIID achievement in isolating the virus could help research into developing test reagents and vaccines all over the world.