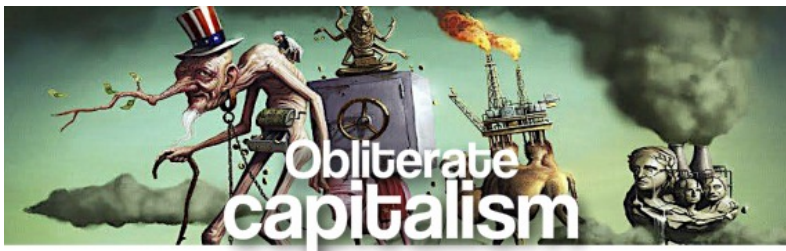


Hopes for coronavirus vaccine rise after infected monkeys become immune

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SOCIAL CHAOS IN OUR TIME

by Stephen Chen in Beijing

[South China Morning Post](#)

- Primates found to have developed antibodies after being infected with Covid-19 – a discovery that suggests the immune system will fight back against the disease. Scientists have been puzzled by instances of patients apparently being reinfected with the disease, but this study suggests that may not be the case.



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24.7.19

(Cat Ba langur, iPad art by George Burchett)

Scientists who infected monkeys with the coronavirus that causes Covid-19 have found that those that recovered developed effective immunity from the disease – a potentially important discovery in the race to develop a vaccine.

But the researchers also found that the animals could become infected through their eyes, which means wearing a face mask may not be enough to protect people from the disease.

Scientists around the world have been racing to develop a vaccine and the first clinical trials could be held in China and the US within a month.

But a number of cases, where people who had tested negative for the disease and were discharged from hospital only to give a positive result a few days later, have cast doubt on the process.

If it turns out that these patients had been reinfected by the same virus, then vaccines will not prove effective.

But the monkey experiment carried out by a team from the Chinese Academy of Medical Sciences may help dispel that fear.

Details of the experiment were made available last Saturday on bioRxiv, a website for studies pending peer review.

Professor Qin Chuan wrote that his research team infected four rhesus monkeys with the Covid-19 strain and the animals started to show signs of sickness three days later.

They developed a fever, started struggling to breathe and lost their appetite and weight.

On the seventh day of the experiment, Qin euthanised one of the monkeys and found the virus had spread throughout its body from nose to bladder with visible damage to the lung tissues.

The remaining monkeys, however, recovered gradually and eventually stopped showing symptoms.

About a month later, after tests returned negative results and X-rays showed their internal organs had fully recovered, two monkeys were dosed with the virus through the mouth.

The scientists recorded a temporary temperature rise, but other than that everything appeared to stay normal.

Autopsies were performed on these two monkeys about two weeks later, and the researchers could not find a trace of the virus in their body.

Meanwhile, very high antibody levels were detected after the second weeks, suggesting that the immune system was prepared to fight the disease.

Qin said the results would have “important implications in evaluating vaccine development”.

The researchers argued that the positive test on some recovered patients may be down to some other cause rather than the patients becoming reinfected.

“It may be attributed to ‘false negative’ ... test results before their discharge or the patients not making a full recovery even though they meet the criteria for a discharge,” they wrote.

The animal experiment supports observations made by some doctors on the front line in the fight against the disease.

Professor Zhong Nanshan, a leading government scientist, said in Guangzhou last week that they had found a strong presence of antibodies in recovered patients, which meant the virus could no longer use them as a carrier again.

“Now the question everyone cares about is whether the close contacts and family members may be infected because [the patient] tested positive again. So far I have not seen any evidence,” Zhong said.

Nonetheless, the government has taken precautions. From March 5, all patients discharged from hospitals need to stay in a quarantine facility for another two weeks.

A doctor, who works at a public hospital in Beijing

looking after Covid-19 patients, said the experiment provided valuable information because monkeys are genetically close to humans but “what happens on monkeys does not always work on us”.

The doctor also said that a recent case in Japan has caused “some concerns in medical circles” after the health authorities reported that a 70-year-old patient who had recovered was hospitalised again for developing Covid-19 symptoms such as fever and difficulty breathing.

In a separate experiment involving three monkeys, Qin and colleagues also found evidence to suggest people could be infected through the eyes.

Wang Guangfa, a senior medical expert from Beijing, was infected after a trip to Wuhan to investigate the early outbreak despite wearing a face mask and other protective gear.

Wang suspected that the virus entered into his body through the eyes as he wiped sweat from his forehead, but had no evidence to support the theory.

He later recovered at home in Beijing with relatively mild symptoms.

To verify the theory, Qin and colleagues dropped a solution containing the virus into two monkeys’ eyes.

To their surprise, the researchers did not find the virus on the surface of the monkeys’ eyes the next day. But several days later, both animals tested positive.

Further investigations showed that the viral strain might have landed on the conjunctiva, a tissue lining the inside of the eyelids and covering the white of the eye, and then travelled through the tear duct before

ending up in the upper throat.

However, the infection suffered by the monkeys appear to be less severe than that of another animal that had caught the virus through the throat, according to another paper posted by Qin on bioRxiv last Saturday.

According to several other recent studies, the new coronavirus can survive in the air or on metal surfaces for days.

The scientists wrote that their findings suggested that people should be more aware of the need to protect their eyes.

They argued transmission could be cut by “regular hand-washing in daily life and wearing protective eyewear when in close contact with patients or in crowded places, especially for clinicians”.

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