Abstract

Recently the infectious diseases emerge frequently. Furthermore traveling and the interactions between the nations or people become more and more. Therefore, the possibility of that the infectious diseases were imported into Taiwan follow increasingly, such as the outbreak of SARS (Severe Acute Respiratory Syndrome) in Taiwan. In this year, the SARS CoV (Corona virus) was imported into Taiwan by airplane, followed by the transmission in hospitals or societies. The fatal rate of SARS infection is around 15% and it spreads through human-to-human by droplet and contact. So far, there is scarcely the experience and capability to cure and diagnosis or vaccine to prevent. Under this unknown situation, it makes all the people feel panic. Even though the epidemic of SARS is over now, nobody can guarantee it will never come back again.

In the early stage of the SARS infection, the symptoms just like the infection of influenza or many of other diseases. Hence, it is urgent to develop and establish a specific, sensitive, simple, speedy and reproducible diagnostic system, which can help the diagnoses during the early stage of epidemic and stop the further spread of the disease or decrease the load of quarantine. As to now, there are some of the diagnosis methods, but the diagnosis rates are still low. Therefore, it is required to improve or develop the method of diagnosis.

During this year, we received only one sample to be detected the infection of Nipah, rabies or West Nile viruses and all the result showed negative. We spent most of our effort on the development of SARS CoV detection in this year. We designed several pairs of primers on S(spike) and N(nucleocapsid) genes which can work on both RT-PCR and LightCycler. Only one tube and one RT-PCR are required and its sensitivity can reach 10 and 1 molecule of DNA or RNA template individually inRT-PCR and LightCycler. If the patient samples or infected cell lysates were assayed, the sensitivity using the primer set on N gene is higher than those using other set of primers by one log. Following this study, we also designed RNA competitor to distinguish the contamination of the RT-PCR inhibitors and try to raise the detection rate.

During this year, another part of works focuses on the improvement of RT-PCR detection method in Ebola viruses. From 1990 up to now, Ebola viruses has already broken out several times in Africa. Ebola viruses can cause severe hemorrhagic fever and are highly contagious and high fatal rate. It belongs to the biohazard level 4 and newly emerging viruses. In 2001, according the analysis of the bioinformatics, we designed the RT-PCR and nested PCR detection methods which need two steps. We improved the method that just need one tube and one time of RT-PCR and the sensitivity can reach below 10 molecule of Zaire or Restone strains of DNA or RNA templates.

Keywords: SARS CoV；Ebola virus；RT-PCR；RNA competitor