

Coronavirus the Newly Emerged Zoonotic Virus Causing Worldwide Health and Economic Concerns

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Coronavirus was isolated and identified as new virus in the year 1961. Electron microscopy examination to this the newly isolated virus showed a club- shaped surface which give the appearance of a solar corona (Figure 1). Because for this solar corona shape the family name for this newly identified virus was named *Coronaviridae*. Coronavirus is a helical nucleocapsid (as schematically shown figure 2). The virus consists of single strand RNA of positive polarity associate with N-protein, F1 glycoprotein, and E2 glycoprotein. In summary, this morphology is a positive-sense, single-stranded RNA enveloped virus. There are thee outbreaks occurred from two strains of this coronavirus. These strains are SAR coronavirus (SAR-CoV), SARS stand for Severe Acute Respiratory, and MERS coronavirus (MERS-CoV), MER stand for Middle Eastern Respiratory syndrome. SAR-CoV was first reported in Asia in February 2003 and caused global outbreak infected over 8,000 persons with estimated 774 death as estimated by World Health Organization (WHO). MERS-CoV was first reported in the year 2012 in Middle East, infected over 1,000 persons with estimated 350 death. The source of MERS-CoV was identified to be from a camel in Saudi Arabia. Again, in the year 2015 MERS-CoV was reported in South Korea and spread globally infected over 9,000 persons with estimated 2,000 death.

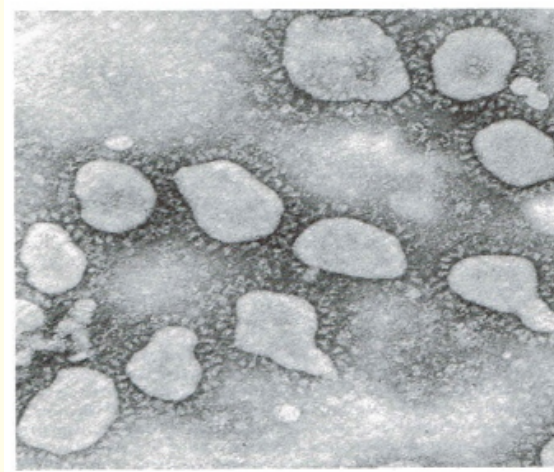


Figure 1: Electron micrograph of Coronavirus.

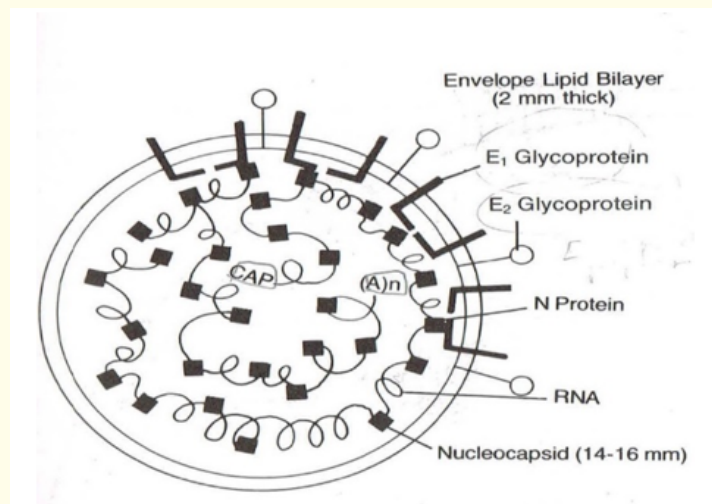


Figure 2: Coronavirus morphology Schematically shown.

Viruses are continuously mutated, and this year (2020) coronavirus outbreak is initiated in China and it could be one of these two strains (SAR-CoV, and MEDS-CoV) or a mutant as a new strain. In general, infection with coronaviruses begin with high fever following by headache and body aches. Some patients develop mild respiratory symptoms, and diarrhea. The late symptom are dry cough and most patients develop pneumonia that could be deadly at the end. Coronaviruses spread by close person to person contact and broadly through the air (airborne spread). Coronaviruses infects the host cell cytoplasm (as schematically shown in figure 3), the virus RNA inside infected cell goes through translation and transcription process to produce virus protein particles and virus RNAs. These replicated proteins and RNAs is assembled inside infected cell into multiple coronaviruses. Released coronaviruses from the damaged host cell infect neighboring healthy cells in the patient and virus replication cycles continue. Replicated coronaviruses in infected host cell are also released through the patient mouth, nose, or eyes contaminating the air and infect healthy person via person to person contact or via the contaminated air. This family of *Coronaviridae* are zoonosis viruses (animals are reservoir for these viruses and cause fatal disease to human). That said, the source of human infection by these deadly zoonosis viruses are because some countries selling live exotic animals including snakes, and bats for meat consumption. To minimized these outbreaks by these zoonotic viruses such as coronaviruses, selling live domestic animals, exotic animals and bird to be slaughters by consumers for meat must be forbidden. These scarified animals and birds must be first inspected by veterinarian, slaughtered in certified slaughterhouses, processed under food safety protocols, and marketed to consumers as raw meat, pre-cooked, or fully cooked in refrigerated sealed packages. Such regulations will minimize these deadly outbreaks [1-3].

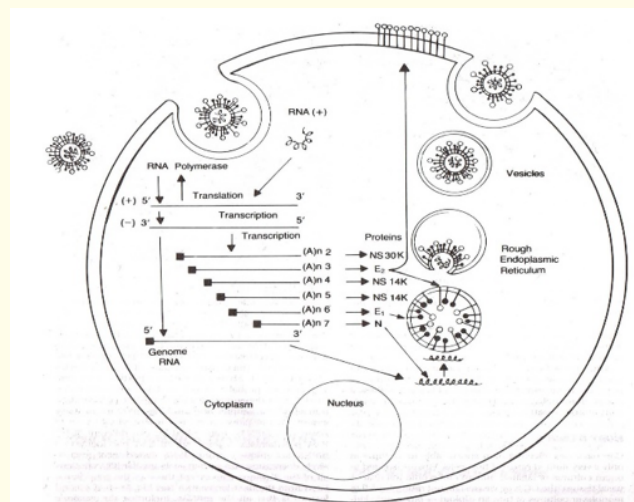


Figure 3: Coronavirus replication process schematically shown.

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