Coronaviruses are a diverse group of viruses infecting

many different animals, and they can cause mild to

severe respiratory infections in humans. In 2002 and

2012, respectively, two highly pathogenic coronaviruses

with zoonotic origin, severe acute respiratory syndrome

coronavirus (SARS-CoV) and Middle East respiratory

syndrome coronavirus (MERS-CoV), emerged in

humans and caused fatal respiratory illness, making

emerging coronaviruses a new public health concern

in the twenty-first century’. At the end of 2019, a novel

coronavirus designated as SARS-CoV-2 emerged in the

city of Wuhan, China, and caused an outbreak of unusual

viral pneumonia. Being highly transmissible, this novel

coronavirus disease, also known as coronavirus disease

2019 (COVID-19), has spread fast all over the world\*’.

it has overwhelmingly surpassed SARS and MERS in

erms of both the number of infected people and the

spatial range of epidemic areas. The ongoing outbreak of

COVID-19 has posed an extraordinary threat to global

public health\*». In this Review, we summarize the cur-

rent understanding of the nature of SARS-CoV-2 and

COVID-19. On the basis of recently published findings,

his comprehensive Review covers the basic biology

of SARS-CoV-2, including the genetic characteristics,

the potential zoonotic origin and its receptor binding.

Furthermore, we will discuss the clinical and epide-

miological features, diagnosis of and countermeasures

against COVID-19.

Emergence and spread

In late December 2019, several health facilities in

Wuhan, in Hubei province in China, reported clusters of

patients with pneumonia of unknown cause’. Similarly

to patients with SARS and MERS, these patients showed

symptoms of viral pneumonia, including fever, cough