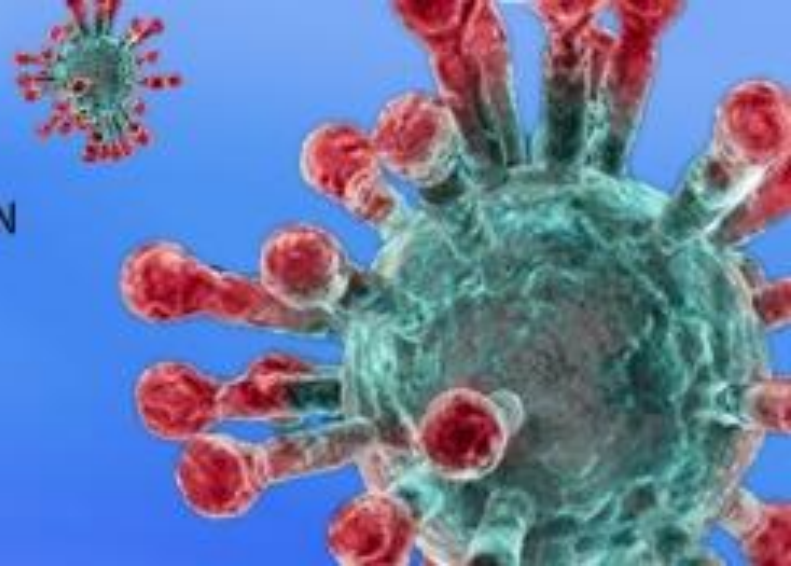
SITH-ITB
SEKOLAH ILMU DAN TEKNOLOGI HAYATI

FAKULTAS KEDOKTERAN
UNIVERSITAS PADJADJARAN

SEMINAR & TALK SHOW 2020

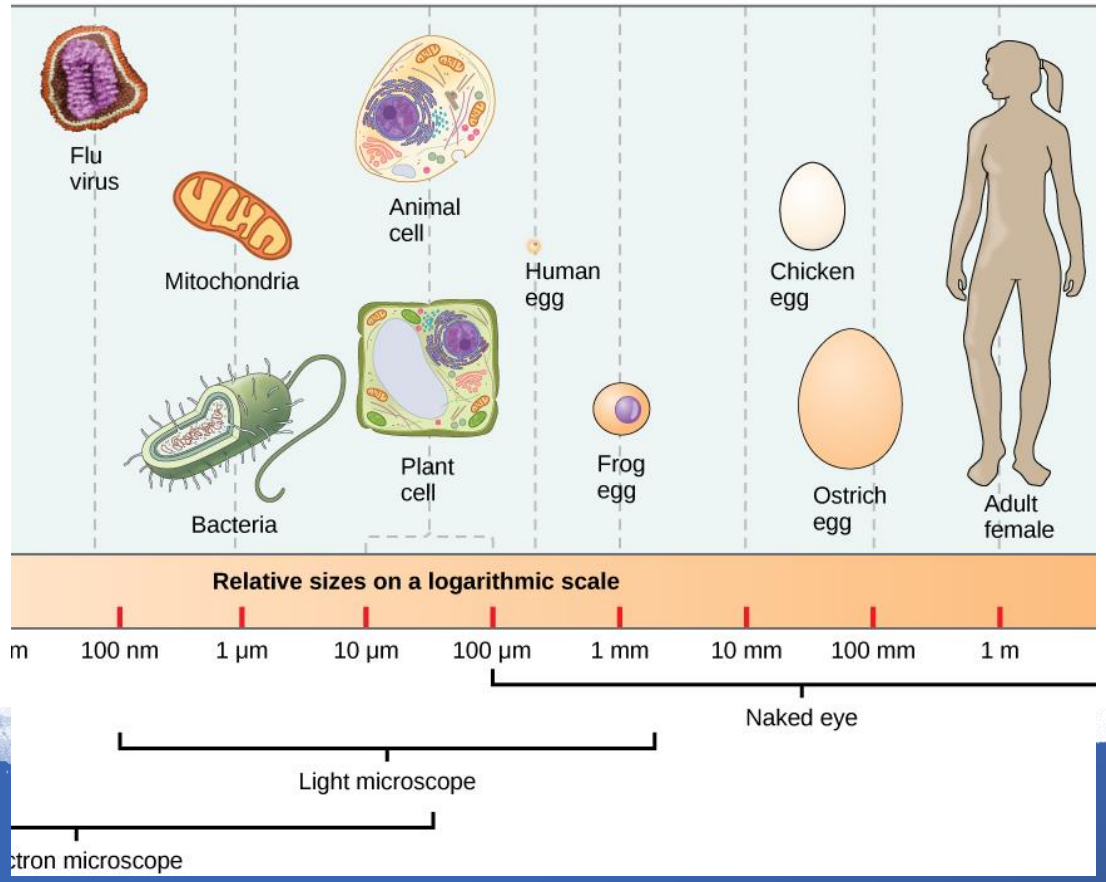


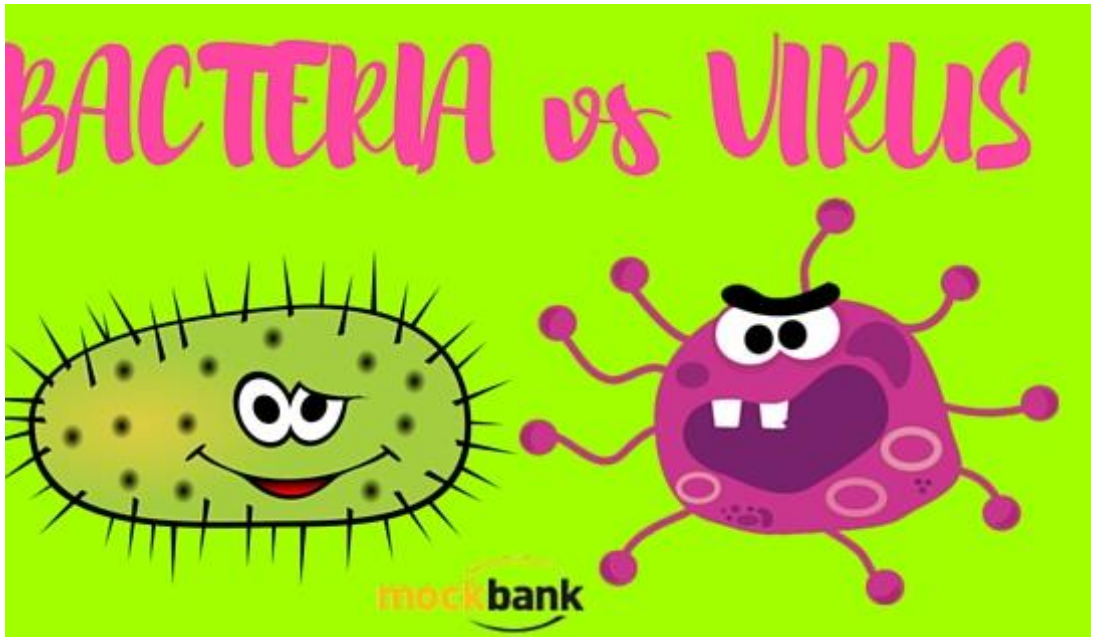
INTRODUCTION TO NOVEL CORONA VIRUS (2019-nCoV) INFECTION

Azzania Fibriani

Ernawati Giri Rahman

Husna Nugraha Praja





Bakteri *vs* Virus

Persamaan: Bakteri dan Virus dapat menyebabkan penyakit pada manusia, hewan dan tumbuhan

Perbedaan: Bakteri dapat hidup di luar tubuh inangnya, **Virus tidak dapat hidup di luar tubuh inangnya**

Epidemi Novel Coronavirus 2019 (2019-nCoV)

Wuhan Huanan Seafood Wholesale Market

Laporan WHO 3 Februari 2020

SITUATION IN NUMBERS
total and new cases in last 24 hours

Globally
17391 confirmed (2838 new)

China
17238 confirmed (2831 new)
2296 severe (186 new)
361 deaths (57 new)

Outside of China
153 confirmed (7 new)
23 countries
1 death

WHO RISK ASSESSMENT

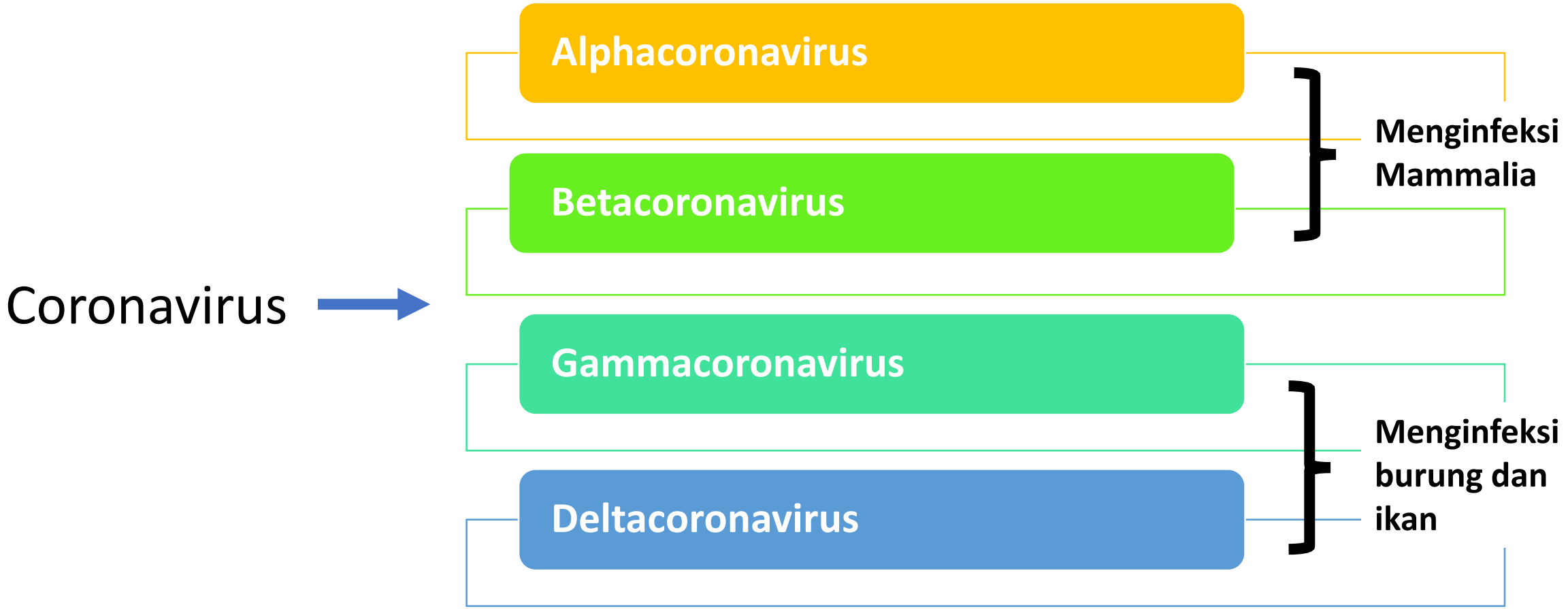
China	Very High
Regional Level	High
Global Level	High

Tingkat kematian 2%

Perbandingan 2019-nCoV, MERS, SARS, dan Virus Corona

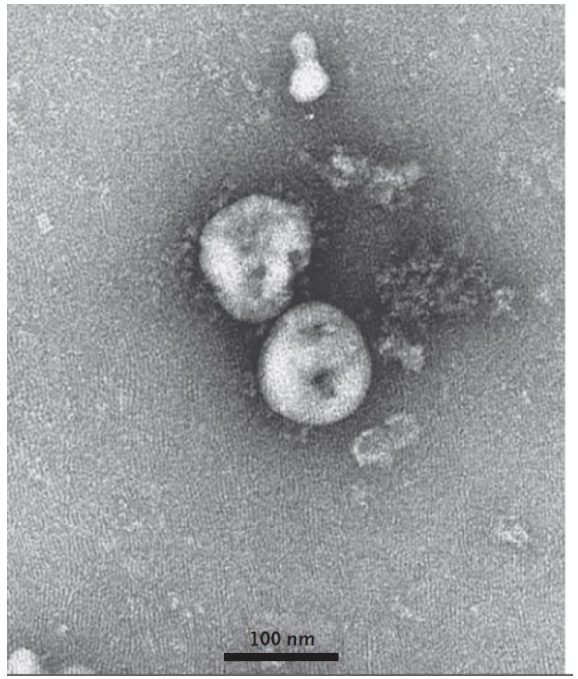
	Wuhan coronavirus (2019-nCoV)	Middle East respiratory syndrome (MERS)	Severe acute respiratory syndrome (SARS)	Common cold caused by coronavirus
Origin	First reported in December 2019 in Wuhan, China.	First reported in 2012 in Saudi Arabia.	First reported in 2002 in southern China.	Four coronavirus strains are thought to be responsible for 15-30% of common colds.
Transmission	Likely from touching or eating an infected, as yet unidentified animal. Human-to-human transmission occurs through close contact.	Often from touching infected camels or consuming their milk or meat. Limited transmission between humans through close contact.	Believed to have spread from bats, which infected civets.Transmitted mainly between humans through close contact.	Close contact with infected humans or touching a surface that carries the virus.
Cases	Around 500 confirmed; 17 deaths as of Jan. 22. Some victims were older males with preexisting conditions.	2,494 confirmed cases; 858 deaths (as of Nov. 30, 2019). Mortality rate of 34%.	8,098 cases; 774 deaths. Mortality rate of about 10%.	Millions each year. Generally nonlethal with rare exceptions.
Current status	Cases reported mainly in Wuhan, as well as other parts of China and Asia. One case reported in U.S.	All cases linked to Arabian Peninsula, with 80% in Saudi Arabia. Others in about two dozen countries, including U.S. Cases and deaths have been declining since 2016.	No new cases reported since 2004. 87% of previous cases in China and Hong Kong.	Circulates year-round, but more common in fall/winter.

https://www.npr.org/sections/goatsandsoda/2020/01/22/798277557/how-does-wuhan-coronavirus-compare-to-mers-sars-and-the-common-cold



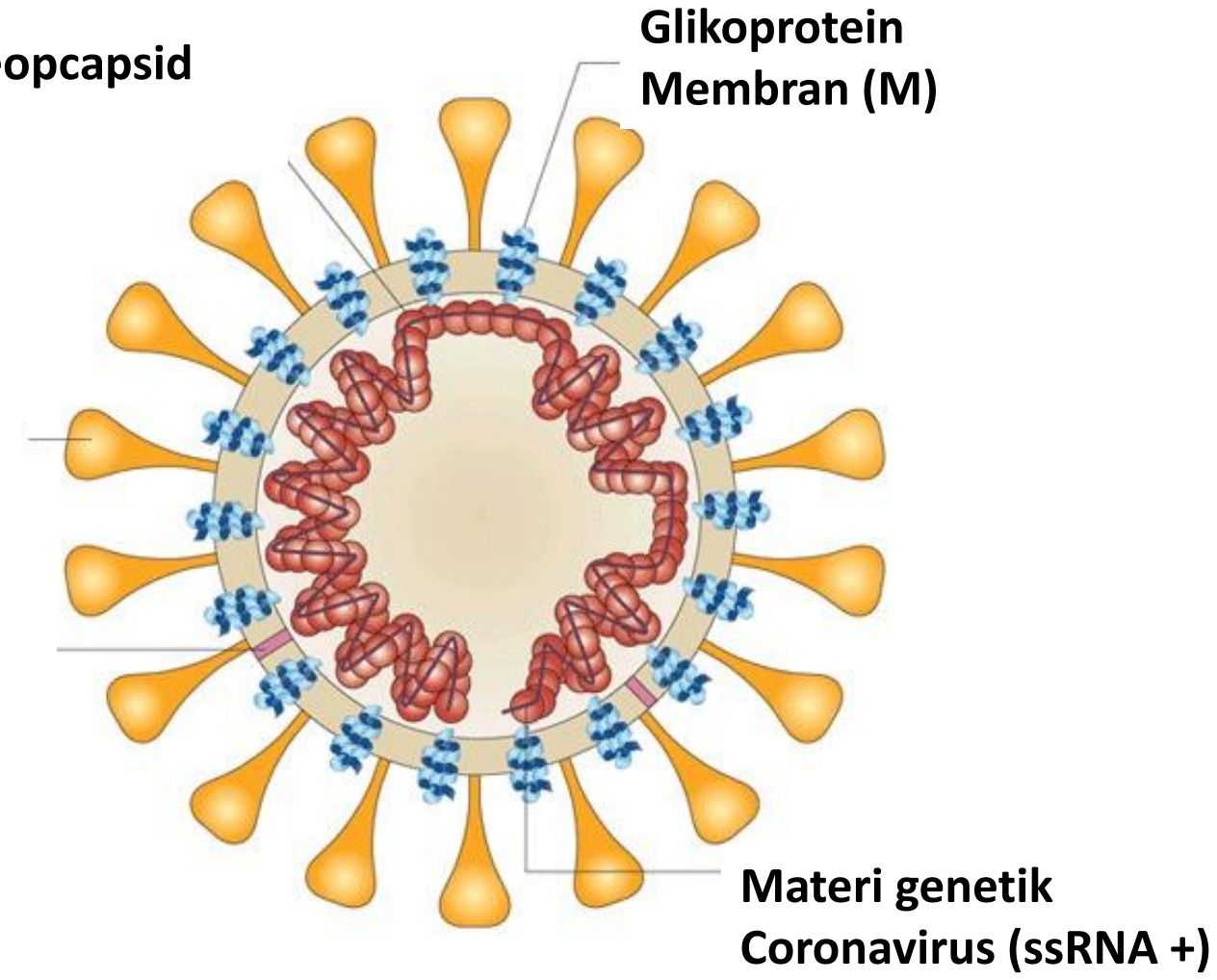
Pengelompokkan Virus Corona

Struktur 2019-nCoV



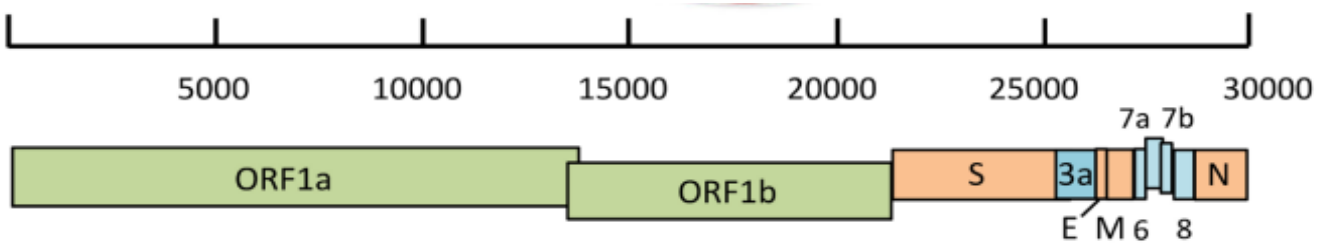
DOI: 10.1056/NEJMoa2001017

Visualisasi 2019-nCoV dengan Transmission Electron Microscope (TEM)

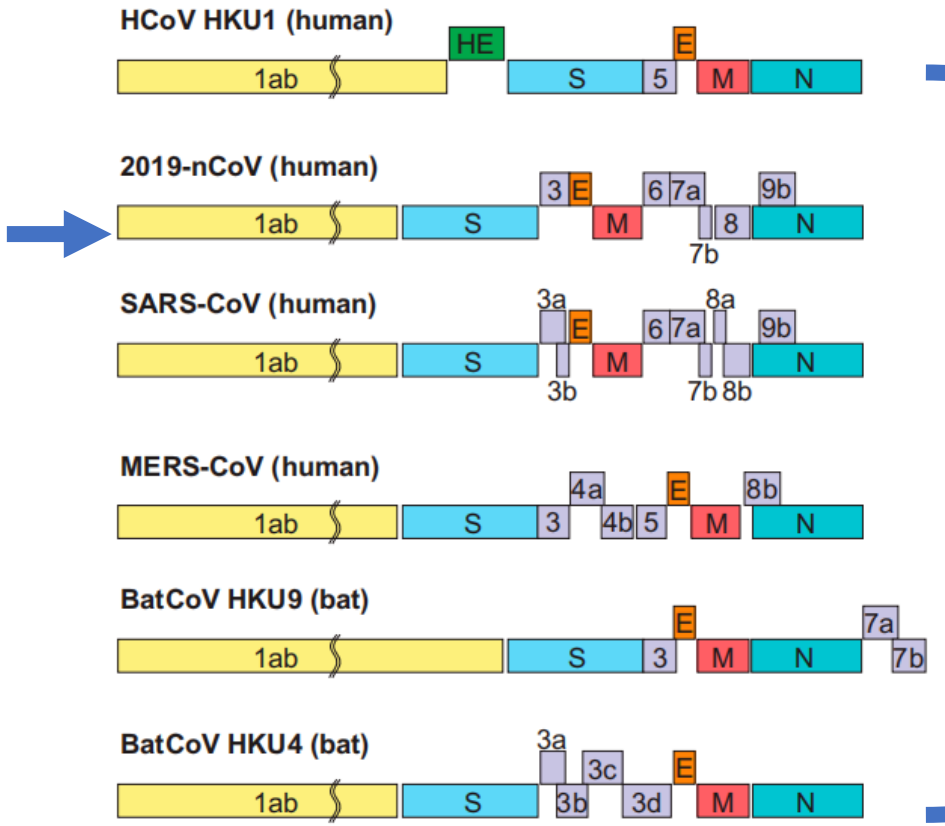


https://microbenotes.com/severe-acute-respiratory-syndrome-coronavirus-sars-cov/

Struktur materi genetik 2019-nCoV



Struktur materi genetic 2019-nCoV



Perbandingan struktur genetik 2019-nCoV dengan virus Betacorona yang lain

PENGELOMPOKKAN 2019-nCoV BERDASARKAN MATERI GENETIKNYA

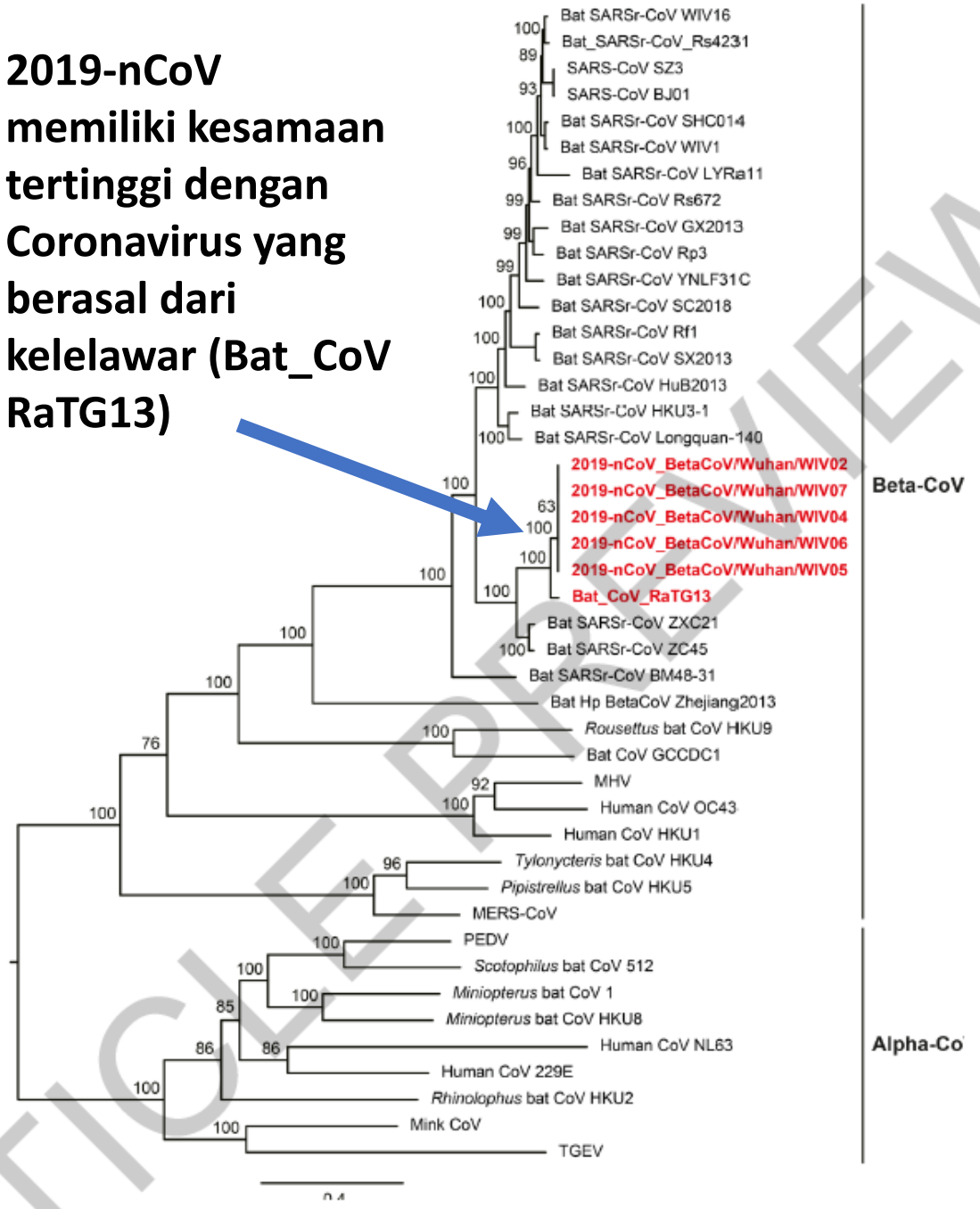
nature

https://doi.org/10.1038/s41586-020-2012-7

Accelerated Article Preview

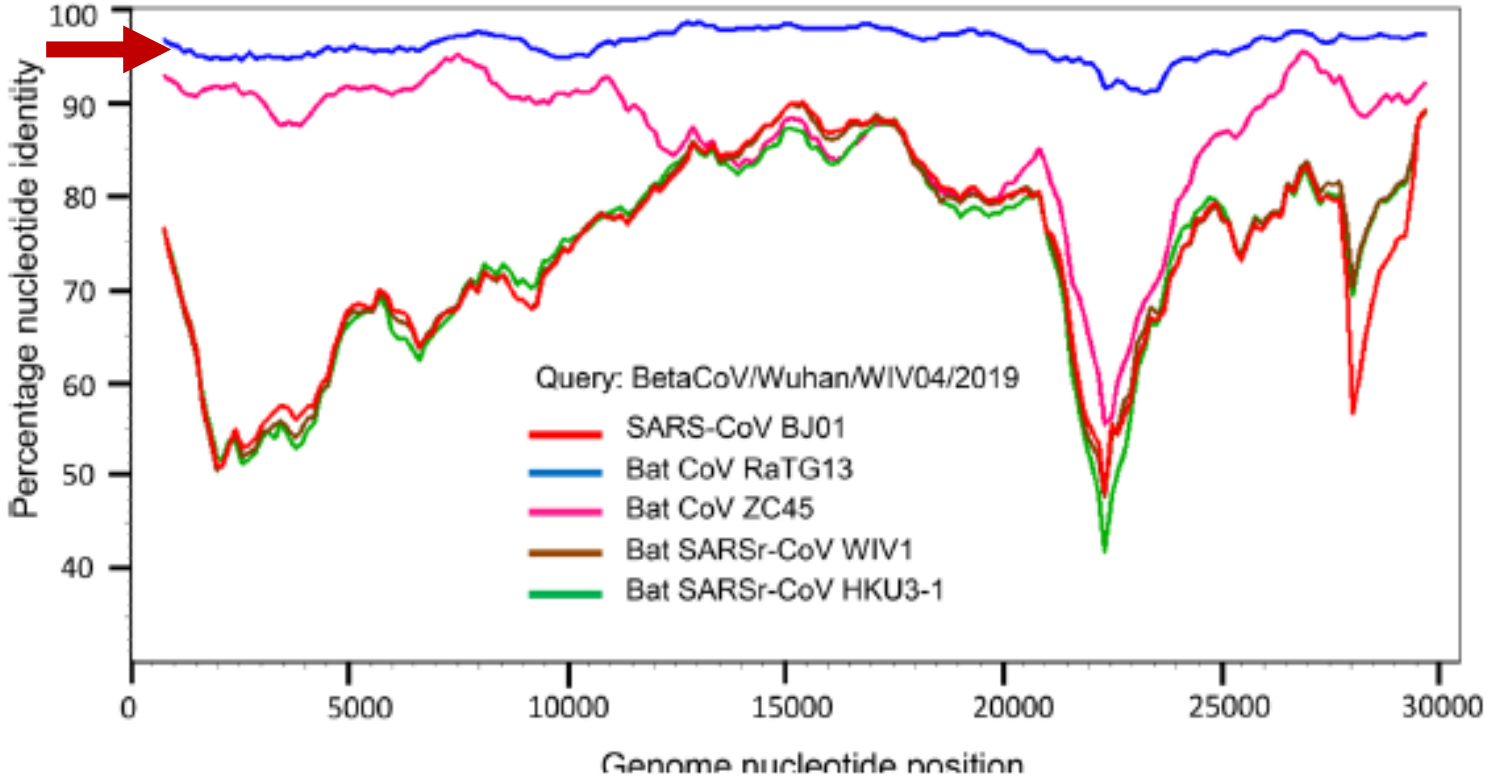
A pneumonia outbreak associated with a new coronavirus of probable bat origin

2019-nCoV memiliki kesamaan tertinggi dengan Coronavirus yang berasal dari kelelawar (Bat_CoV RaTG13)

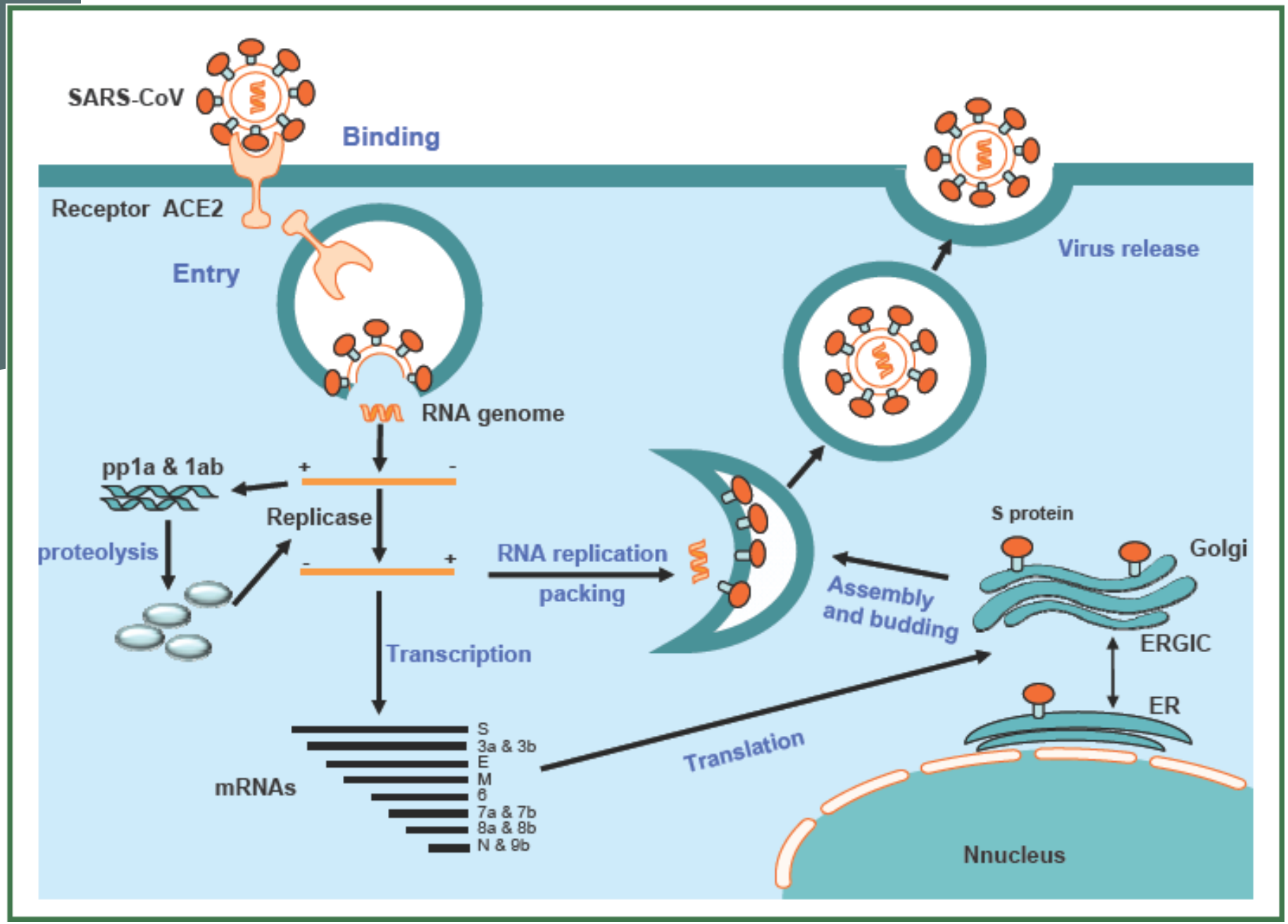


PERBANDINGAN 2019-nCoV DENGAN CORONAVIRUS SARS DAN NON-SARS PADA KELELAWAR

2019-nCoV memiliki kesamaan materi genetik tertinggi sebesar 96% dengan virus Corona non-SARS yang ada di kelelawar (Bat CoV RaTG13)



SIKLUS HIDUP VIRUS CORONA



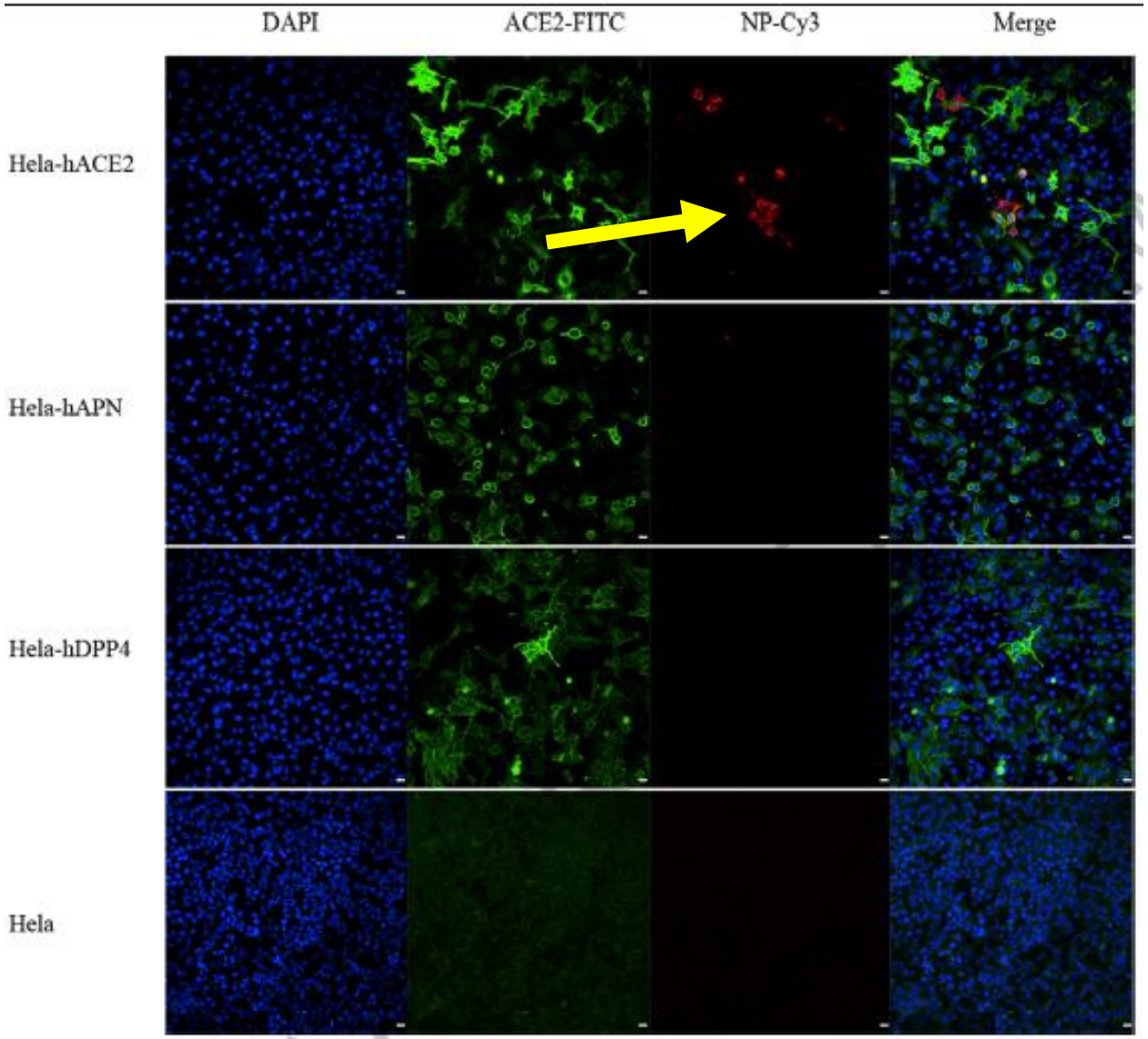
http://jtd.amegroups.com/article/view/1209/html

ANGIOTENSIN-CONVERTING ENZYME 2 (ACE2) KANDIDAT RESEPTOR 2019-nCoV

nature
https://doi.org/10.1038/s41586-020-2012-7
Accelerated Article Preview

A pneumonia outbreak associated with a new coronavirus of probable bat origin

- ACE2 terdapat pada sel di pembuluh darah jantung dan ginjal
- ACE2 juga terdapat pada sel epitel di saluran pernafasan (Jia, et al., 2002) dan saluran pencernaan (Vuille-dit-Bille, et al, 2014)
- ACE2 juga merupakan reseptor untuk virus SARS (Li, et al., 2005)

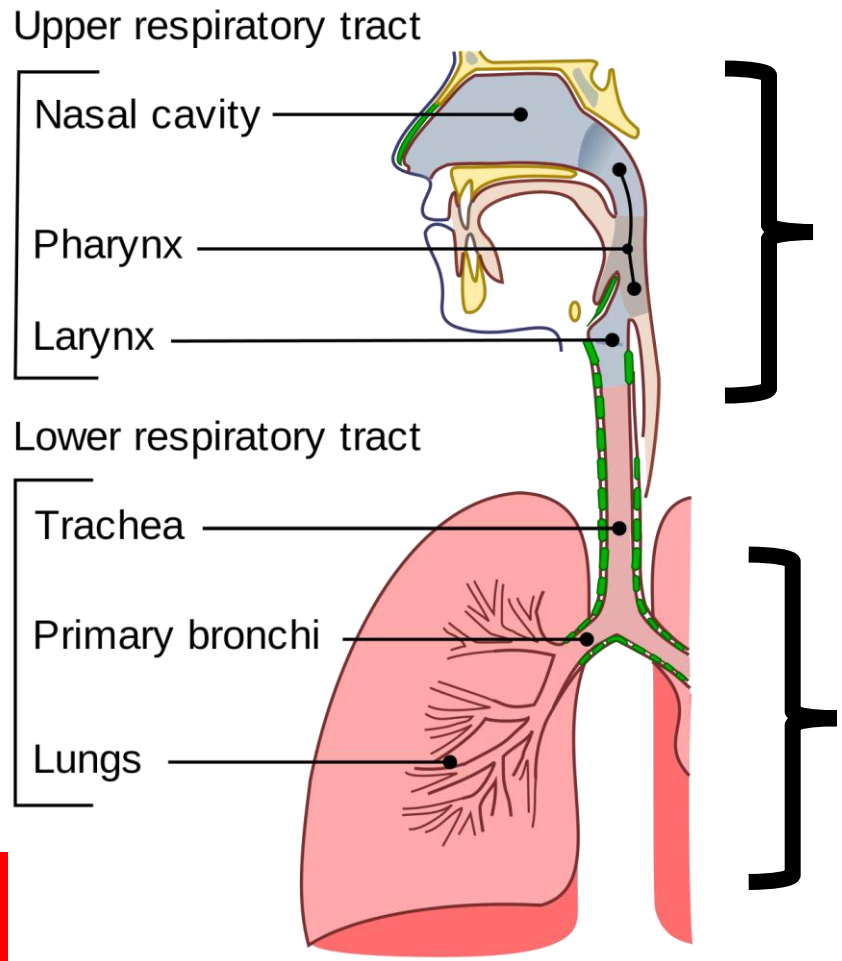


Analisis reseptor 2019-nCoV . Determination of virus infectivity in HeLa cells with or without the expression of human APN andDPP4. ACE2 protein (green), viral protein (red) and nuclei (blue) were shown. Scale bar=10 um.

PATOGENISITAS DARI VIRUS CORONA

Human CoV-229E
Human CoV-NL63

SARS-CoV
MERS-CoV



Saluran pernafasan atas

Saluran pernafasan bawah

Beberapa infeksi virus Corona pada hewan dapat menyebabkan diare

The NEW ENGLAND JOURNAL of MEDICINE

BRIEF REPORT

A Novel Coronavirus from Patients with Pneumonia in China, 2019

Foto rontgent pasien 2019-nCoV hari ke-2

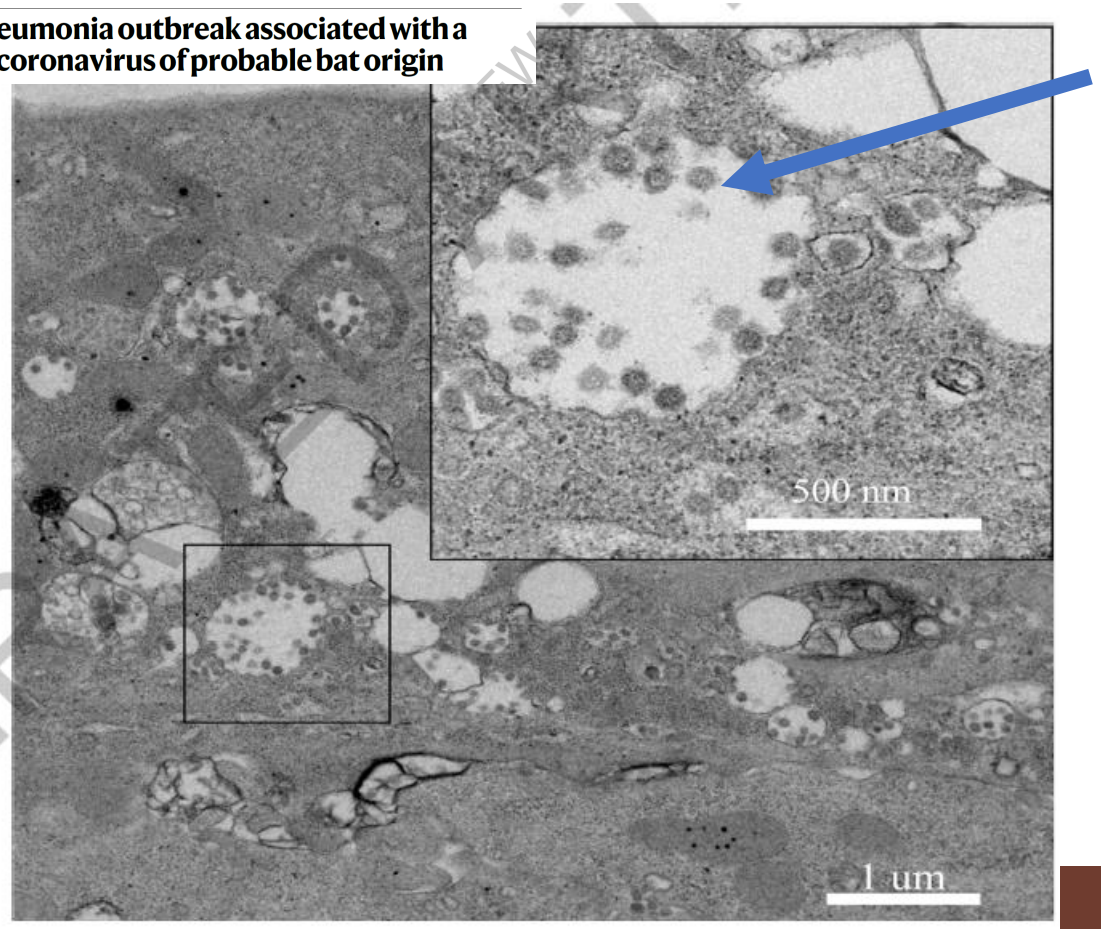
Foto rontgent pasien 2019-nCoV hari ke-8

PATOGENISITAS DARI 2019-NCOV

2019-nCoV dapat menyebabkan infeksi saluran pernafasan bawah, contohnya pneumonia (paru-paru basah)

nature
https://doi.org/10.1038/s41586-020-2012-7
Accelerated Article Preview

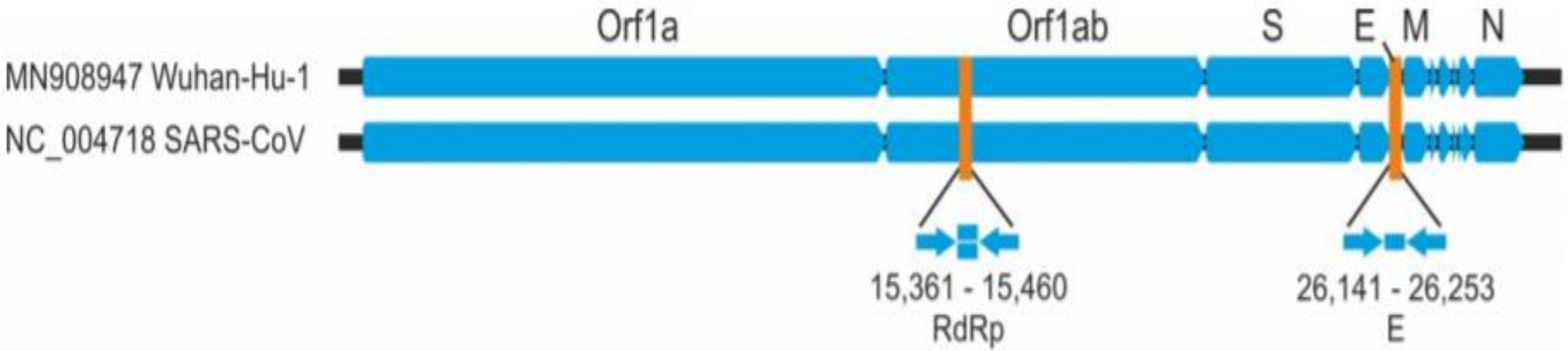
A pneumonia outbreak associated with a new coronavirus of probable bat origin



Vesikula berisi virus yang sudah bereplikasi

Pengamatan kultur sel yang terinfeksi 2019-nCoV

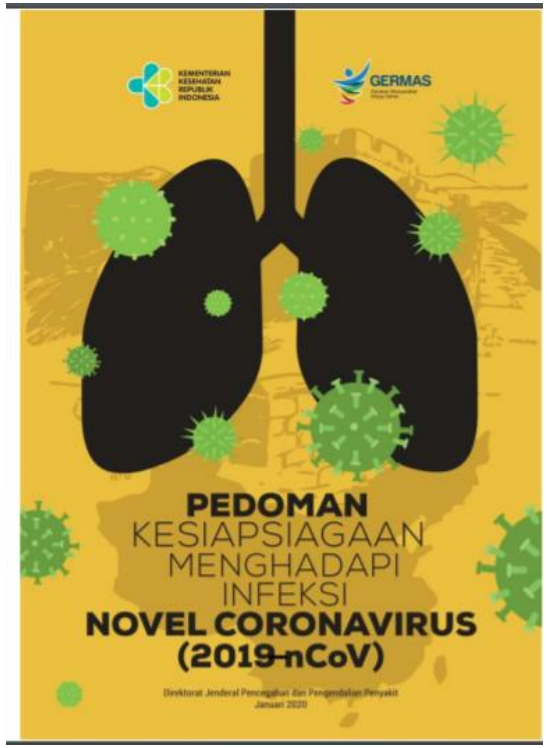
- Kultur sel ginjal (Vero cell lines) yang dinfesikan dengan 2019-nCoV
- Pada jam ke-24 setelah infeksi, dapat diamati adanya partikel virus yang sudah bereplikasi

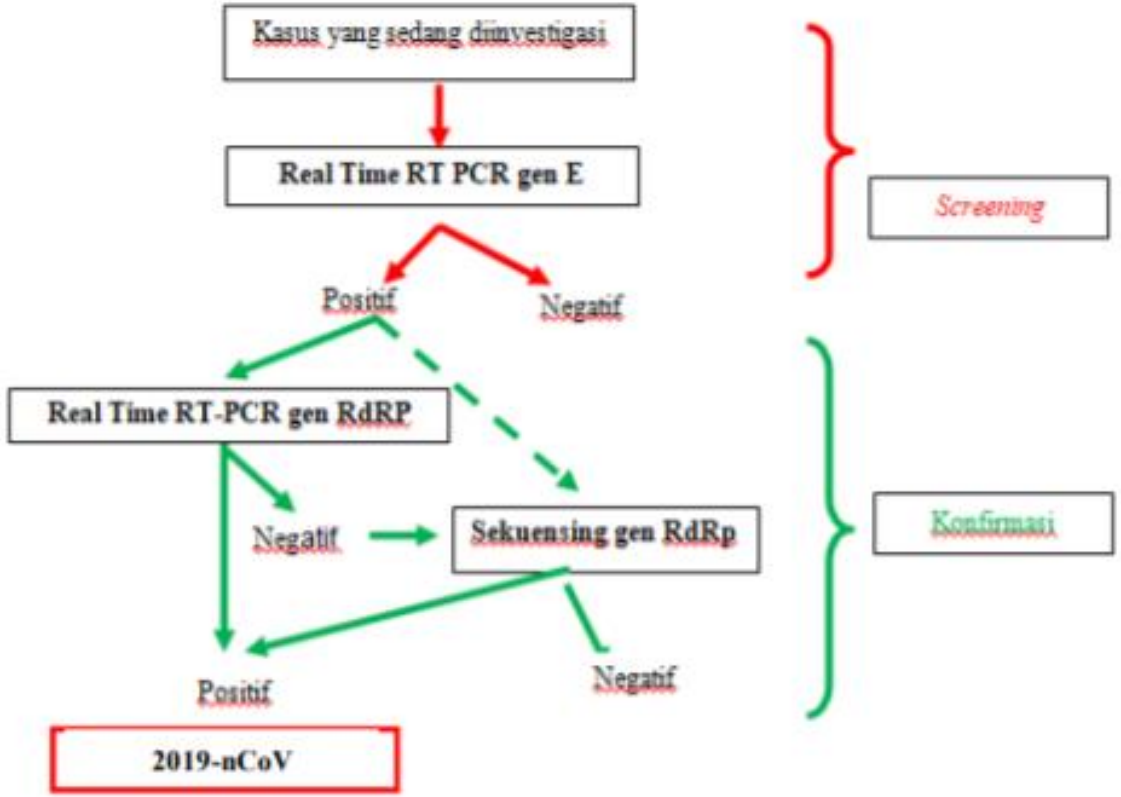


Tes Diagnostik untuk 2019-nCoV

- WHO merekomendasikan untuk menggunakan metoda Polymerase Chain Reaction (PCR) untuk mendeteksi infeksi 2019-nCoV

https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200130-sitrep-10-ncov.pdf?sfvrsn=d0b2e480_2





Tes diagnostik 2019-nCoV di Indonesia

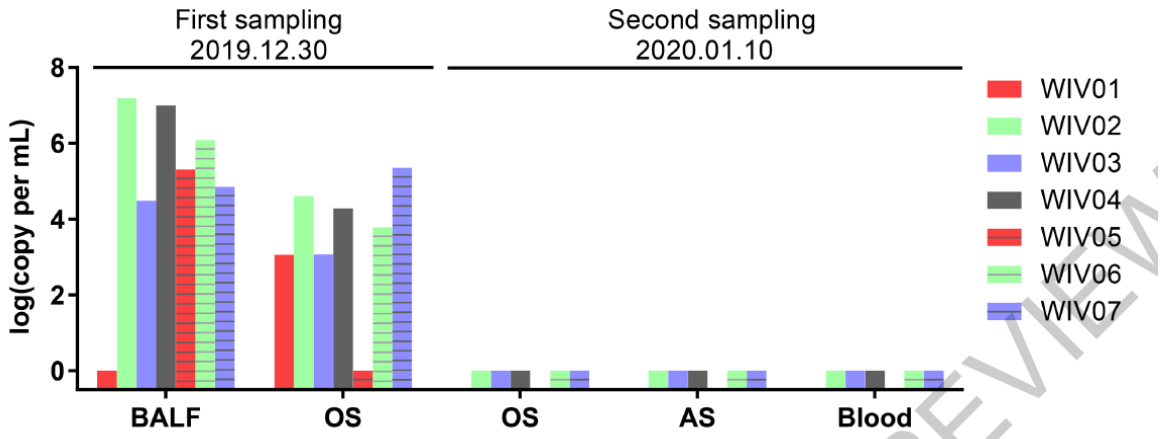
- Indonesia sudah memiliki panduan tes diagnostik untuk deteksi infeksi 2019-nCoV yang sesuai dengan rekomendasi WHO

nature
https://doi.org/10.1038/s41586-020-2012-7
Accelerated Article Preview

A pneumonia outbreak associated with a new coronavirus of probable bat origin

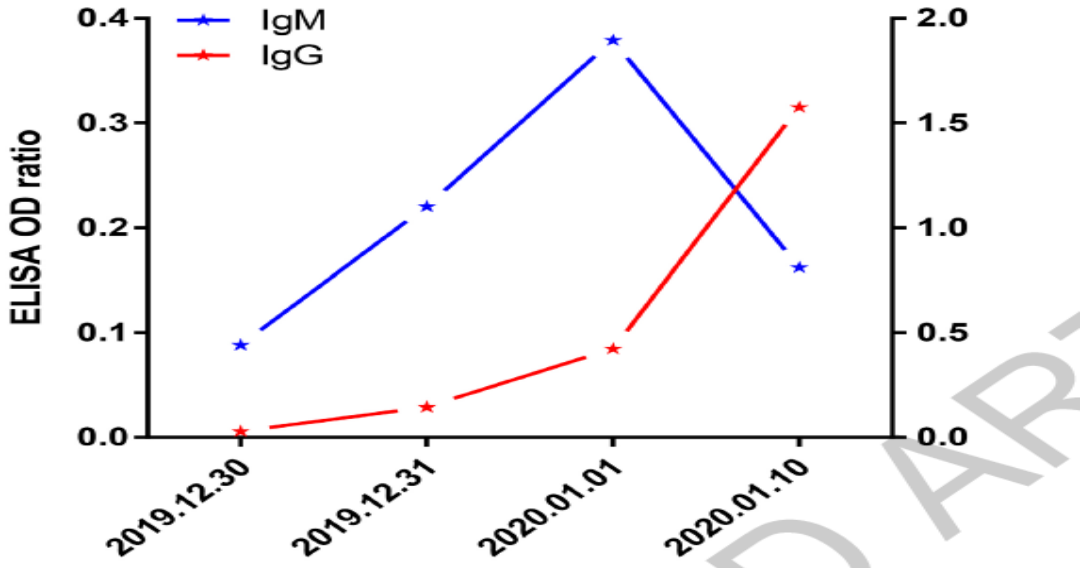
Pada hari ke-18 2019-nCoV tidak terdeteksi pada sampel apusan oral, apusan anal, dan juga sampel darah

Hari ke-7 Hari ke-18



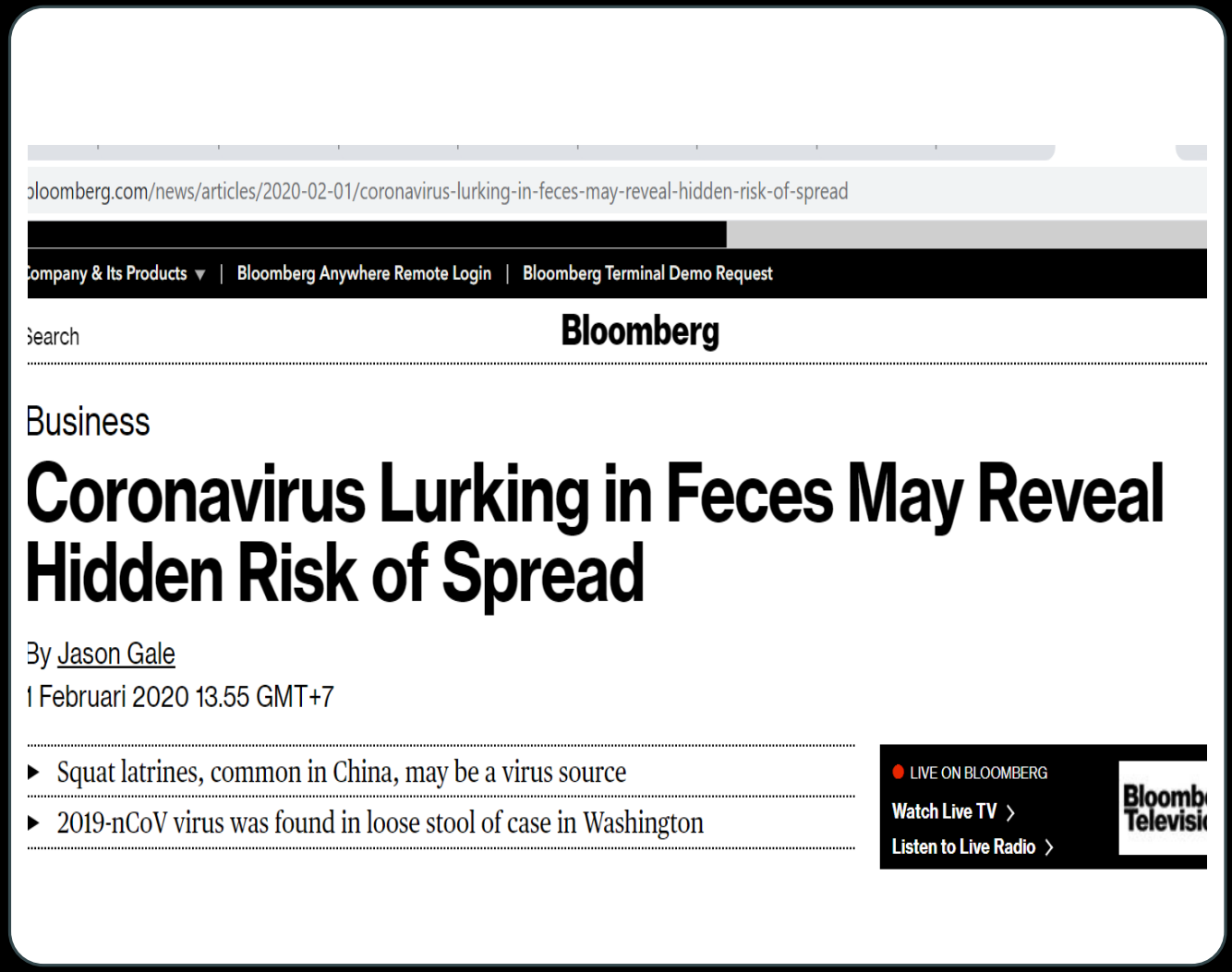
HASIL TES REAL-TIME PCR PADA 7 PASIEN TERINFEKSI 2019-nCoV

HASIL TES SEROLOGI PADA 7 PASIEN TERINFEKSI 2019-nCoV



Hari ke-7 Hari ke-18

- 2019-nCoV dapat terdeteksi pada sampel feces dari pasien yang positif terinfeksi di USA
- Virus corona disebut juga pneumoenteric virus
- Gejala Diare dapat muncul sebelum gejala pneumonia



Lopimune (Lopinavir + Ritonavir) Being Used To Treat 2019 Novel Coronavirus (2019–nCoV)

PELUANG PENGOBATAN 2019-nCOV

- Lopinavir adalah obat protease inhibitor yang biasa digunakan untuk mengobati pasien HIV
- Lopinavir digunakan untuk pengobatan SARS (Chu, et al., 2003)

https://www.unitedpharmacies.md/blog/lopimune-lopinavir-ritonavir-being-used-to-treat-2019-novel-coronavirus-2019-ncov/

PELUANG VAKSIN 2019-nCOV

- **Sampai saat ini belum ada vaksin untuk 2019-nCoV , begitu juga vaksin untuk SARS dan MERS**

KESIMPULAN (1)

- Infeksi 2019-nCoV memiliki tingkat kematian lebih rendah (2%) dari pada SARS (10%) dan MERS (34%)
- Infeksi 2019-nCoV lebih”menular” daripada SARS dan MERS
- 2019-nCoV memiliki kemiripan yang tinggi dengan virus Corona dari kelelawar (**Bat_CoV RaTG13)**

KESIMPULAN (2)

- 2019-nCoV menggunakan reseptor yang sama dengan SARS, yakni reseptor ACE2
- Metoda PCR/Real-time PCR dapat digunakan untuk mendeteksi infeksi 2019-nCoV
- Lopinavir/ritonavir, dapat dijadikan kandidat obat untuk infeksi 2019-nCoV
- Belum ditemukan vaksin untuk infeksi 2019-nCoV

Kelompok Keilmuwan **GENETIKA DAN Bioteknologi Molekuler**

TERIMA KASIH

TIM CORONA Kelompok Keilmuwan Genetika dan Bioteknologi Molekuler SITH,ITB

- Ernawati Giri Rahman
- Husna Nugraha Praja
- Alidza Fauzi
- Gede Kamalesha
- Sigit Nur Pratama