**Name of Journal:** *World Journal of Gastroenterology*

**Manuscript NO:** 58438

**Manuscript Type:** MINIREVIEWS

# Origin and genomic characteristics of SARS-CoV-2 and its interaction with angiotensin converting enzyme type 2 receptors, focusing on gastrointestinal tract



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## Abstract

The emergence of coronavirus disease-2019 induced by a newly identified b-coronavirus, namely severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has constituted an emergency for public health. Even though it was considered as a zoonotic disease, the virus is also spread among humans *via* respiratory secretions. The expression and allocation of angiotensin converting enzyme type 2 (ACE2) in various

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## The origin, transmission and clinical therapies on ...

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7068984

Mar 13, 2020 · Systematic detection of β-CoV receptors showed that human cells expressing ACE2, but not **human Dipeptidyl peptidase-4 (DPP4) or APN (Aminopeptidase N)**, were enhanced entry of SARS-CoV-2 . While, another study showed that S-protein and ACE2 binding efficiency is 10- to 20- fold higher than that of SARS-CoV, evidenced by Cryo-EM Structure of the SARS-CoV ...

**Cited by:** 491 **Author:** Yan Rong Guo, Qing Dong Cao, Zhong ...
**Publish Year:** 2020

## (PDF) Genomic and Biologic Characteristics of SARS-CoV-2 ...

https://www.researchgate.net/publication/340984188_Genomic_and_Biologic...

In this article, general biological **and genetic characteristics** of coronaviruses are discussed and some of them are compared with **SARS-CoV-2**. Keywords: ...

## SARS-CoV-2: characteristics and current advances in ...

https://virologyj.biomedcentral.com/articles/10.1186/s12985-020-01369-z

Coronavirus disease 2019 (COVID-19) caused by **SARS-CoV-2** infection has spread rapidly across the world and become an international public health emergency. Both **SARS-CoV-2** and SARS-CoV belong to subfamily Coronavirinae in the family Coronaviridae of the order Nidovirales and they are classified as the SARS-like species while belong to different cluster. Besides, viral structure, ...

## Novel SARS-CoV-2/COVID-19: Origin, pathogenesis, genes and ...

https://www.sciencedirect.com/science/article/pii/S2452014420301667

In this review, we focused on the origins of the novel coronavirus (**SARS-CoV-2**), **origin**, pathogenesis, immune responses, genes **and genetic** variations, phylogenetic analyses, and potential therapeutic strategies to summarize approaches for developing broadly effective preventions and vaccines to cope COVID-19.

**Cited by:** 5 **Author:** Yasmeen Junejo, Mehmet Ozaslan, Muh...
**Publish Year:** 2020

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## SARS-CoV-2: characteristics and current advances in ...

https://virologyj.biomedcentral.com/articles/10.1186/s12985-020-01369-z

Jul 29, 2020 · Like SARS-CoV, the entry of SARS-CoV-2 is mediated by the recognition of the receptor binding domain (RBD) in the S protein and the angiotensin converting enzyme 2 (ACE2) receptor on the surface of the **host cell**, and the activation of S protein is related to TMPRSS2, whose inhibitors can prevent virus invasion [ 13 ].

**Cited by:** 1 **Author:** Yicheng Yang, Yicheng Yang, Zhiqiang Xiao...
**Publish Year:** 2020

## The genetic sequence, origin, and diagnosis of SARS-CoV-2 ...

https://link.springer.com/article/10.1007/s10096-020-03899-4

Apr 24, 2020 · The **genome** of Coronaviruses, ranging from 26 to 32 kilobases in length, includes a variable number of open reading frames (ORFs) [].The **SARS-CoV-2 genome** was reported to possess 14 ORFs encoding 27 proteins [].The spike surface glycoprotein plays an essential role in binding to **receptors** on the host cell and is crucial for determining host tropism and transmission capacity, ...

**Cited by:** 22 **Author:** Huihui Wang, Xuemei Li, Tao Li, Shubing Zh...
**Publish Year:** 2020

## Novel SARS-CoV-2/COVID-19: Origin, pathogenesis, genes and ...

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Sep 01, 2020 · In this review, we focused on the origins of the novel coronavirus (**SARS-CoV-2**), **origin**, pathogenesis, immune responses, genes **and genetic** variations, phylogenetic analyses, and potential therapeutic strategies to summarize approaches for developing broadly effective preventions and vaccines to cope COVID-19.

**Cited by:** 2 **Author:** Yasmeen Junejo, Mehmet Ozaslan, Muha...
**Publish Year:** 2020

## ACE2 receptor polymorphism: Susceptibility to SARS-CoV-2 ...

https://www.sciencedirect.com/science/article/pii/S1684118220301092

Jun 01, 2020 · Very recently, investigation of **SARS-CoV-2 cell entry** through **ACE2 binding** showed important commonalities between **SARS-CoV and SARS-CoV-2 infection**, including similar choice of entry receptors. 32 SARS-CoV and SARS-CoV-2 share about 76% amino acids identity and most amino acid residues essential for ACE2 binding were conserved in the SARS-CoV-2 spike S1 domain.

**Cited by:** 27 **Author:** Christian A. Devaux, Christian A. Devaux, J...
**Publish Year:** 2020

## SARS-CoV-2 on the ocular surface: is it truly a novel ...

https://bjo.bmj.com/content/early/2020/08/25/bjophthalmol-2020-316263

Aug 25, 2020 · In comparison with the full **genomic** sequences **of SARS-CoV-2**, BCoV sequences show 96.2% similarity, which suggests that bats may be the zoonotic **origin of SARS-CoV-2**. 9 10 High-throughput sequencing and a real-time reverse-transcription PCR (RT-PCR) assay revealed that **SARS-CoV-2** was closely related (88%) to two bat-derived SARS-like CoVs, bat ...

## Dual function of sialic acid in gastrointestinal SARS-CoV ...

https://www.sciencedirect.com/science/article/pii/S1382668920301125

Recent analysis concerning the **severe acute respiratory syndrome coronavirus 2** (**SARS-CoV-2**)-angiotensin converting enzyme (ACE) receptor interaction in enterocytes, the definition of **gut-lung axis**, as well as the molecular basis of sialic acid-related dual recognition concept in **gastrointestinal SARS-CoV-2 infection**, have brought a new perspective to potential therapeutic targets.

## SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is ...

https://www.researchgate.net/publication/339775105...

**SARS-CoV-2** binds with **its spike** (S) protein to the **angiotensin-converting** enzyme-related **carboxypeptidase-2** (**ACE-2**) receptor on the host cell using the **cellular serine protease** TMPRSS2 for S...

## SARS-CoV-2 jumping the species barrier: Zoonotic lessons ...

https://www.sciencedirect.com/science/article/pii/S1477893920303264

Sep 01, 2020 · **SARS-CoV-2** has shown **characteristics** of efficient replication in the upper respiratory **tract**, causing the less abrupt onset of clinical signs just like the common cold and unlike SARS-CoV . It can also replicate in the lower respiratory **tract** as has been noted in cases without pneumonia but having lesions in the lungs on radiological ...

## High expression of ACE2 receptor of 2019-nCoV on the ...

https://www.nature.com/articles/s41368-020-0074-x

Feb 24, 2020 · It has been reported that **ACE2** is the main host cell receptor of 2019-nCoV and plays a crucial role in the entry of virus into the cell to cause the final infection. To investigate the potential ...

## SARS-CoV-2 entry factors are highly expressed in nasal ...

https://www.nature.com/articles/s41591-020-0868-6

Apr 23, 2020 · The coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (**SARS-CoV-2**) 1.Detection of the virus was first reported in ...

## Composition and divergence of coronavirus spike proteins ...

https://onlinelibrary.wiley.com/doi/10.1002/jmv.25726

SARS-CoV enters the respiratory **tract** by the receptor **ACE2**. 14 It was reported that **SARS-CoV-2** uses the same cell entry receptor. 18 To understand the possibility **of SARS-CoV-2** RBD binding **with ACE2**, the structure of spike protein **of SARS-CoV-2** was simulated (Figure 4A).

## 2019 Novel coronavirus infection and gastrointestinal tract

https://onlinelibrary.wiley.com/doi/full/10.1111/1751-2980.12851

However, the connection between the lung and the **gastrointestinal tract** is not completely understood. It is well known that the respiratory **tract** houses **its** own microbiota, but patients with respiratory infections generally have gut dysfunction or secondary gut dysfunction complications, which are related to a more severe clinical course of the ...

## Severe acute respiratory syndrome coronavirus-2 (SARS-CoV ...

https://diagnosticpathology.biomedcentral.com/...

Aug 14, 2020 · The world is currently witnessing a major devastating pandemic of Coronavirus disease-2019 (COVID-19). This disease is caused by a novel coronavirus named Severe Acute Respiratory Syndrome Coronavirus-2 (**SARS-CoV-2**). It primarily affects the respiratory **tract** and particularly the lungs. The virus enters the cell by attaching **its** spike-like surface projections to the angiotensin ...

## Expression of the SARS-CoV-2 cell receptor gene ACE2 in a ...

https://idpjournal.biomedcentral.com/articles/10.1186/s40249-020-00662-x

Apr 28, 2020 · SARS-CoV-2, which is the virus causing coronavirus disease 2019 (COVID-19), uses the angiotensin-converting enzyme 2 (ACE2) as a cell receptor to invade human cells. Thus, ACE2 is the key to understanding the mechanism of SARS-CoV-2 infection.

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Jul 29, 2020 · Like SARS-CoV, the entry **of SARS-CoV-2** is mediated by the recognition of the receptor binding domain (RBD) in the S protein and the **angiotensin converting enzyme 2** (ACE2) receptor on the surface of the host cell, and the activation of S protein is related to TMPRSS2, whose inhibitors can prevent virus invasion . Most of the SARS-CoV-induced ...

**Cited by:** 2 **Author:** Yicheng Yang, Yicheng Yang, Zhiqiang Xi...
**Publish Year:** 2020

## Angiotensin-converting enzyme 2 (ACE2), SARS-CoV-2 and the ...

https://onlinelibrary.wiley.com/doi/full/10.1002/path.5471

May 17, 2020 · **Angiotensin-converting enzyme 2** (ACE2), the functional receptor **of SARS-CoV-2**, plays a crucial role in the pathogenesis of COVID-19, as it provides viral entry into human cells [7, 8]. The viral spike (S) protein **of SARS-CoV-2** binds to ACE2 as a ...

**Cited by:** 26 **Author:** Arno R. Bourgonje, Amaal Eman Abdulle,...
**Publish Year:** 2020

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https://link.springer.com/article/10.1007/s10096-020-03899-4

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