

# Researchers investigate the virology of coronaviruses

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The molecular virology of coronaviruses is explored in a newly published book chapter written by researchers at Lancaster University.

The chapter entitled "Coronavirus Therapeutics—Volume I: Basic Science and Therapy Development," published by Springer Nature, discusses advances in the molecular virology of coronaviruses, with a

special focus on SARS-CoV-2.

Lead virologist Dr. Muhammad Munir from Lancaster University said, "Following the recent COVID-19 pandemic, it is now more important than ever that we obtain an in-depth understanding of coronaviruses and how they infect human populations, so that we can prevent and control future outbreaks."

This chapter is critical in exploring the molecular virology of coronaviruses, examining characteristics such as their genomic structure, virion [morphology](#), methods of entry, viral replication, immune interactions and pathogenesis in order to gain a better understanding of the current Severe Acute Respiratory Syndrome 2 (SARS-CoV-2) outbreak and potential future coronavirus outbreaks.

Dr. Munir said, "Since the start of the pandemic, the public has witnessed the power of biomedical research in understanding SARS-CoV-2 transmission and control. Whilst significant progress has been made in unearthing how SARS-CoV-2 causes disease, fundamental and hardcore virological aspects still remain largely unexplored.

"We hope that this comprehensive document provides key understanding around the virology of SARS-CoV-2 and identifies significant research gaps in which future research should be focused."

SARS-CoV-2 is a large, enveloped positive-sense RNA coronavirus and has been identified as the causative agent of the COVID-19 pandemic. Previous coronavirus outbreaks include Severe Acute Respiratory Syndrome 1 (SARS-CoV-1) and the Middle East Respiratory Syndrome (MERS-CoV).

A team of virologists in the Division of Biomedical and Life Sciences have discussed that SARS-CoV-2 shares a high level of homology with

the previous SARS-CoV-1 coronavirus and both viruses share a common receptor named angiotensin-converting enzyme 2 (ACE2). However despite these similarities, there are multiple factors that resulted in the SARS-CoV-2 outbreak being much harder to control than the previous SARS [outbreak](#).

Third year Ph.D. student and first author of the chapter Emily Clayton said, "Studying a Ph.D. centered around viral zoonoses during the course of the COVID-19 pandemic has provided me with contemporary learning experiences from laboratory based research to studying fundamental aspects of viruses."

Mahmoud Bayoumi, who is also a Ph.D. student, said, "I am pleased to contribute into an in-depth explanation of [coronavirus](#) biology with the hope that this piece of work can serve as a source material for the scientific community."

Dr. Mohammed Rohaim, co-author of the chapter, added, "I hope our efforts to critically discuss the fundamental [virology](#) of SARS-CoV-2 will elucidate the key phenotypic features that will help to guide the implementation of targeted control measures and vaccines in the future."

**More information:** Emily Clayton et al, The Molecular Virology of Coronaviruses with Special Reference to SARS-CoV-2, *Coronavirus Therapeutics – Volume I* (2022). [DOI: 10.1007/978-3-030-85109-5\\_2](https://doi.org/10.1007/978-3-030-85109-5_2)

Provided by Lancaster University

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