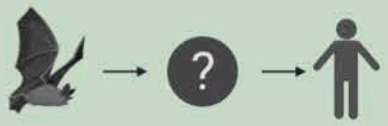
# Profile of a Killer: the Complex Biology Powering the SARS-CoV-2 Pandemic

What sets **SARS-CoV-2 apart from other coronaviruses** and how does it contribute to our current **global pandemic**?

## Unique Characteristics of Coronaviruses

**Recombination** within the family can result in **infection of new species and cell types**

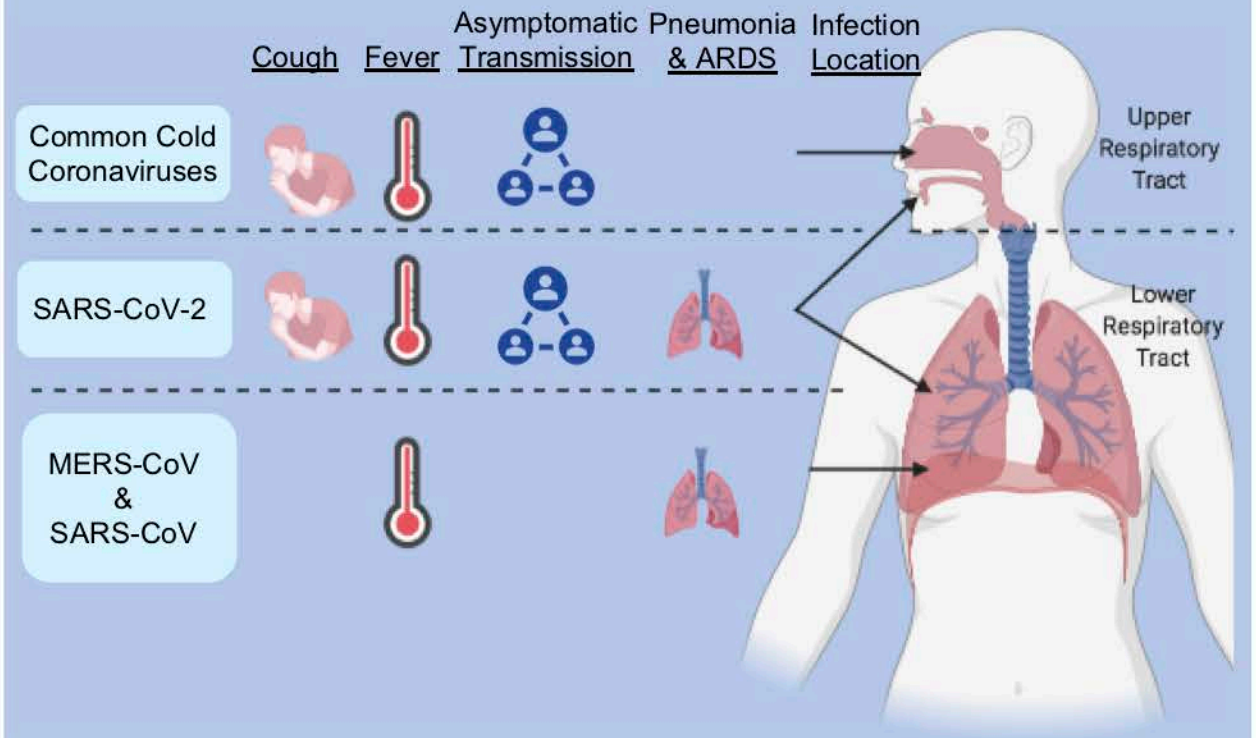


Viral genomic **proofreading** using sub-genomic RNA **prevents mutations** rendering some **common antivirals ineffective**


## SARS-CoV-2 as compared to SARS-CoV

| SPREAD | ACE2 AFFINITY | TISSUE PENETRANCE | IMMUNE RESPONSE | MORTALITY |
|---|---|---|---|---|
|  |  |  |  |  |
| More **efficient** due to **viral shedding** in saliva | **10-20x greater affinity** for ACE2 receptors | Cleavage enzyme ***furin*** increases lung infection **100-1,000x** | Robust response → overreaction → **end organ damage** | **Equivalent** when lungs are infected |

## SARS-CoV-2 vs Other Coronaviruses




The unique properties of SARS-CoV-2 make it **as transmissible as the common cold** but **as lethal as MERS-CoV and SARS-CoV** infecting the lungs.

Source: David Cyranoski. Profile of a killer: the complex biology powering the coronavirus pandemic. Nature 581, 22-26 (May 4, 2020). doi: 10.1038/d41586-020-01315-7.
Images: BioRender.com

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