

COVID-Gyan content available in English and other vernacular languages

The DBT's autonomous institute, the Institute for Stem Cell Science & Regenerative Medicine (inStem), Bengaluru is one of the founding partners of the pan-institutional website COVID-Gyan, launched on Apr 03, 2020. The website is updated regularly with interesting and scientifically-vetted content relevant to COVID 19 pandemic, keeping the common man in view. The content is available in both English and other vernacular languages.

COVID-19
HOW DOES IT AFFECT YOU?

Coronavirus Disease 2019 (COVID-19) is a pandemic caused by Severe Acute Respiratory Syndrome Coronavirus 2, also called SARS-CoV-2. Despite the widespread awareness regarding COVID-19, many are still unaware about how it affects the human body.

Healthy
Normal gas exchange

Infected
SARS-CoV-2 Structure

Moderate
Impaired Gas Exchange

Severe
Greatly hindered gas exchange

Gas Exchange
Each sac of air, or alveolus, is wrapped with capillaries where red blood cells release carbon dioxide (CO₂) and pick up oxygen (O₂). Two alveolar cells facilitate gas exchange. Type I cells are thin enough that the oxygen passes right through, and Type II cells secrete surfactant – a substance that lines the alveolus and prevents it from collapsing.

Viral Infection
The spike proteins covering the coronavirus bind ACE2 receptors on type II alveolar cells, allowing the virus to enter the cell via endosomal or membrane fusion and release its RNA. The RNA "hijacks" the cell, telling it to assemble many more copies of the virus and release them into the alveolus. The host cell is destroyed in this process and the new coronaviruses infect neighbouring cells.

Immune Response
After infection, type II cells release inflammatory signals that recruit macrophages (immune cells) to the site of injury and exit the capillary. Macrophages release cytokines that cause vasodilation, which allows more immune cells to come to the site of injury and exit the capillary. Fluid accumulates inside the alveolus. The fluid dilutes the surfactant which triggers the onset of alveolar collapse, decreasing gas exchange and increasing the work of breathing. Neutrophils are recruited to the site of infection and release Reactive Oxygen Species (ROS) to destroy infected cells. Type I and II cells are destroyed, leading to the collapse of the alveolus and causing Acute Respiratory Distress Syndrome (ARDS). If inflammation becomes severe, the protein-rich fluid can enter the bloodstream and travel elsewhere in the body, causing Systemic Inflammatory Response Syndrome (SIRS). COVID may lead to septic shock and multi-organ failure, which can have fatal consequences.

WHAT CAN YOU DO?

- Preventative Actions**
There is currently no proven treatment for COVID-19, so following the best practices for preventing infection is crucial. These include:
Practice distancing – keep a distance of at least 2 metres between you and others outside of your home.
Wear face masks.
Wash your hands for at least 20 seconds.
Cough or sneeze into your elbow or a tissue and immediately wash your hands after.
- Stay Healthy**
Make a routine of eating a well-balanced diet, drinking plenty of water, getting enough sleep, exercising, and monitoring your mental health. Reach out to family and friends for support.
- Stay Informed**
With a situation that changes daily, it is crucial to stay informed so you know if any changes have occurred both globally and in your community. Make sure to look for evidence-based sources to avoid misinformation.
- Donate**
Consider donating to local businesses or online funding campaigns if you have financial flexibility. If you have spare time, consider volunteering for community initiatives, such as helping deliver food to those in need.

Source: <https://covid-gyan.in/articles>