



# Vacunas

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## Review article

# COVID-19 story: Entry and immune response

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## ABSTRACT

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is responsible for the pandemic of the coronavirus disease 2019 (COVID-19) that emerged in December 2019 in Wuhan city, China. Understanding the SARS-CoV-2 entry, invasion and infection mechanism is crucial for vaccine development. The immune system is divided into 2 parts: the innate immune system and the adaptive immune system, and they work in essential and powerful ways for SARS-CoV-2 managing and reducing COVID-19 infections. Spike proteins (S) of SARS-CoV-2 are a pivotal key during the viral invasion of the host cells. Cell surface receptors facilitate binding and then membrane fusion for virus endocytosis and causing infection. Host cells are covered with receptors for viral S proteins binding, such as the human angiotensin-converting enzyme 2 receptor. The innate immune responses initiate after viral antigen detection via a set of pathogen recognition receptors, including the Toll-like receptors (TLRs) family. TLRs are largely inducible in most body cell types. After SARS-CoV-2 antigen recognition, cellular sensors stimulate the production of interferons and inflammatory cytokines, which are crucial for controlling viral replication and dissemination. The cellular and humoral responses of the adaptive immune system antibody-producing B-cells, CD4+ T-cells to evoke the immune response, and CD8+ T-cells to kill infected cells. This review outlines the process of virus entry and detection by pattern recognition receptors and antiviral defence by both innate immunity and adaptive immunity for developing immunological memory that can help in vaccines and understanding the immune response to SARS-CoV-2.

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## Historia de la COVID-19: Entrada y respuesta inmunológica

## RESUMEN

El síndrome respiratorio agudo severo por coronavirus 2 (SARS-CoV-2) es el responsable de la pandemia de la enfermedad por coronavirus de 2019 (COVID-19) que surgió en diciembre de 2019 en la ciudad de Wuhan, China. Comprender el mecanismo de entrada, invasión e infección de SARS-CoV-2 es esencial para el desarrollo de la vacuna. El sistema inmunológico se divide en dos partes: el sistema inmunológico innato y el sistema

### Palabras clave:

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