

Genetics and the COVID-19 Pandemic

The clinical spectrum of COVID-19-related disease ranges from asymptomatic to severe, fatal presentations.

Older age, gender and comorbidities being identified (hypertension, diabetes, respiratory system disease and cardiovascular disease). Fatal course also presenting in young, previously healthy individuals. Differences in clinical outcomes may be determined by genetic susceptibility.

Sources

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COVID-19 and ACE2

Severe lung interstitial edema and leukocyte infiltration in Ace2 KO mice are attenuated in homozygous (Ace^{-/-}) or heterozygous (Ace^{+/-}). Balance of ACE2/ACE levels is the key to lung injury/lung protection during an inflammatory storm. The activation of the RAS axis due to binding of Covid19 to ACE2 partly drives the systemic manifestations of SARS-CoV-2.

Sources

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TMPRSS2 is a host cell factor critical for spread of several relevant viruses, including influenza A viruses and coronaviruses.

TMPRSS2 is dispensable for development and homeostasis. A TMPRSS2 inhibitor (serine protease inhibitor camostat mesylate) is approved for (unrelated) clinical use, can block virus entry and might constitute a treatment option for current SARS-CoV-2 patients.

Sources

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