**Gene editing in the prevention and treatment of human diseases 3/22/22 (edited)**

<https://medlineplus.gov/genetics/understanding/genomicresearch/genomeediting/>

Currently, genome editing is used in cells and animal models in research labs to understand diseases. Scientists are still working to determine whether this approach is safe and effective for [use in people](https://medlineplus.gov/genetics/understanding/therapy/genetherapy/).

There is research and clinical trials on many diseases. Examples of single-gene disorders are:

* [cystic fibrosis](https://medlineplus.gov/genetics/condition/cystic-fibrosis/),
* [hemophilia](https://medlineplus.gov/genetics/condition/hemophilia/),
* [sickle cell disease](https://medlineplus.gov/genetics/condition/sickle-cell-disease/).

In the future there may be treatment or prevention of more [complex diseases](https://medlineplus.gov/genetics/understanding/mutationsanddisorders/complexdisorders/), such as

* cancer,
* heart disease,
* mental illness,
* HIV

Please name 4 diseases the Genome (Gene) Editing may treat or prevent in the future.

\* \* \*

**Why Do Some People Never Get Covid? Guest Essay (edited)**

New York Times; 3-8-22; Daniela J Lamas, MD

The unpredictability of the coronavirus has made clear just how much we don’t know Why do some without identifiable risk factors become critically ill while their spouses and children have mild cases?

This remains a mystery — one of the most important of the pandemic. Dr. Mayana Zatz from the University of São Paulo believes crucial clues may lie in our genes.

No single gene mutation could affect the response to the coronavirus. Instead, a **combination of genes may that influence** the activity of **natural killer cells**. They are **key component of the immune system**. But it offered one piece of a puzzle.

Another key figure studying Covid is Dr. Jean-Laurent Casanova of Rockefeller University. He is also working on the same question, but in reverse.

Dr. Casanova identified a small percentage of patients with severe Covid-19 who have mutations in genes involved in interferon—part of the immune system. This resulted in the body not being able to fight off infection. “It’s a surprise for everyone in my field,” he said.

There has never been such a large-scale effort to understand the role genetics might play in the response to one specific infection--especially at a time when scientists have had gene sequencing tools at their disposal.

Dr. Daly of Institute of Molecular Medicine Finland noted, “The knowledge gained here of both susceptibility to, and severity of Covid demonstrates how much genetics can teach us about infectious disease biology.”

Additionally, genetic mutations can have positive and negative effects simultaneously: The same genetic variant that causes mild Covid may also increase severity of other diseases.

It is unlikely that we will ever have a complete explanation of the variability of Covid. Of course, there are the vulnerabilities that we can see. We call these comorbidities. And there are also vulnerabilities that are harder to “see”. These are in our genes..

A combination of genes may influence Natural Killer Cells…a key component of the immune system. \_\_\_ True \_\_\_ False