Some people appear genetically immune to catching COVID — but scientists are still not sure why

[Molecular biology professor Mayana] Zatz's work is part of a growing effort to identify factors that may make people resistant to Covid, with the goal of finding clues to treatments, as well as understanding resistance against viruses more broadly.

Other scientists have run lab experiments using CRISPR genome-editing technology to disable genes, in search of ones that could be manipulated to perhaps protect those of us not fortunate enough to have natural resistance against the coronavirus.

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"The biological implications [of identifying a resistance gene] are important because it will provide one more piece in the assembly of the puzzle of the pathogenesis of Covid," said pediatric immunologist Jean-Laurent Casanova of Rockefeller University, who has been studying the genes involved in Covid-19 severity, but is now shifting to look at elements of resistance. "Medically, if you knew you're resistant, you know, you'd be relaxed. You would feel like King Kong right? The second possibility is that in people who are *not* genetically resistant, you can think of blocking the very same component on the surface of cells that you don't have genetically."

In her Covid studies, [Zatz] is looking for mutations in genes that regulate the immune response to viruses. She hypothesized that two main biological pathways could be involved in resistance. The first is the major histocompatibility complex (MHC), which includes various genes that govern how the immune system recognizes and latches on to viral proteins. Another factor is the leukocyte receptor complex (LRC), which is involved in how various types of white blood cells – such as natural killer (NK) cells — respond to pathogens.

Mayana Zatz, University of São Paulo. Credit:
PATRÍCIA MONTEIRO FOR STAT

In April 2021 Zatz's team published the initial results of the discordant couples study in a preprint posted to medRxiv. Contrary to the lab's hypothesis, no single gene mutation in these pathways was responsible for Covid-19 resistance.

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The resistant individuals were mostly women, with professions ranging from physicians to teachers to the trades. In other words: the ‘super-resisters’ could be anyone. This study has been peer-reviewed and is awaiting publication in the journal Frontiers in Immunology.

This is an excerpt. Read the original post here.