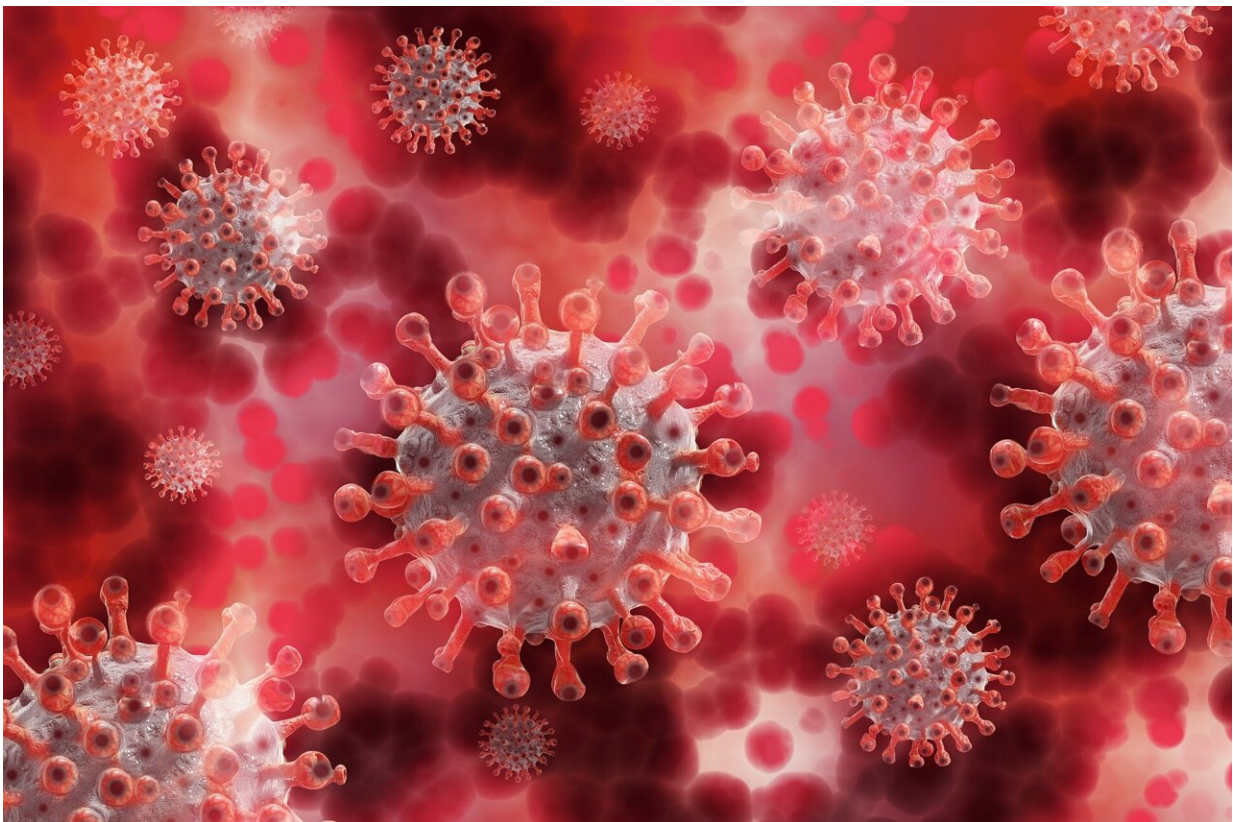


Researchers uncover new insights into why individuals are affected differently by COVID-19 infection

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A team of researchers at NYU Abu Dhabi, led by Associate Professor of Biology Youssef Idaghdour and working in collaboration with clinicians

at several Abu Dhabi hospitals, investigated the association between microRNAs, a class of small RNA molecules that regulate genes, and COVID-19 severity among 259 unvaccinated COVID-19 patients living in Abu Dhabi. The team identified microRNAs that are associated with a weakened immune response and admission to ICU.

During this process, they created the first genomic picture of the architecture of blood microRNAs in unvaccinated COVID-19 patients from the Middle East, North Africa, and South Asia regions whose populations are consistently underrepresented in genomics research. The researchers identified changes in microRNAs at the early stages of infection that are associated with specific blood traits and immune cell death, allowing the virus to evade the [immune system](#) and proliferate.

The results of the system's genetics study demonstrate that a patient's genetic make-up affects immune function and disease severity, offering new insights into how patient prognosis and treatment can be improved. Given the diversity of the sample, there is promise that these findings can be applied to approximately 30% of the world's population who reside in the MENA region and South Asia.

In the study titled "Systems genetics identifies miRNA-mediated regulation of host response in COVID-19," published in the journal *Human Genomics*, the research team presents the results of the analysis of multiple omics datasets—genotypes, miRNA, and mRNA expression of patients at the time of hospital admission, combined with phenotypes from electronic health records. The researchers analyzed 62 clinical variables and [expression levels](#) of 632 miRNAs measured at hospital admission, as well as identified 97 miRNAs associated with eight blood phenotypes significantly associated with ICU admission.

"These findings improve our understanding of why some patients withstand COVID-19 better than others," said Idaghdour. "This study

demonstrates that microRNAs are promising biomarkers for disease severity, more broadly, and targets for therapeutic interventions. The methods of this study can be applied to other populations to further our understanding of how [gene regulation](#) can serve as a core mechanism that impacts COVID-19 and, potentially, severity of other infections."

More information: Systems genetics identifies miRNA-mediated regulation of host response in COVID-19, *Human Genomics* (2023).
[DOI: 10.1186/s40246-023-00494-4](https://doi.org/10.1186/s40246-023-00494-4).
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