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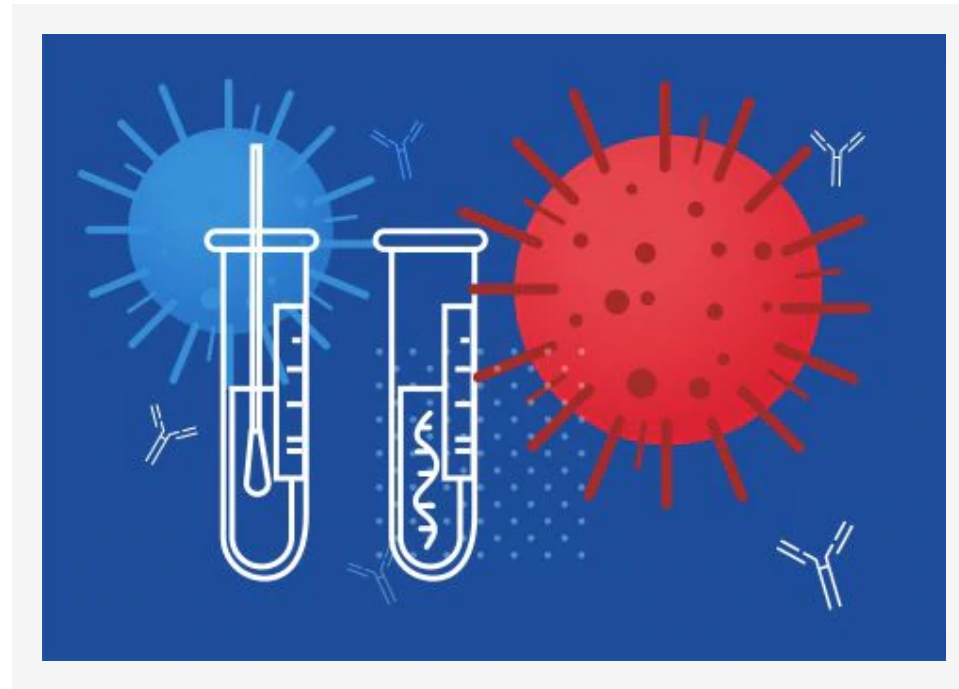
Targeted NGS or Serology for SARS-CoV-2 Epidemiology Research?

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By Behind The Bench Staff
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Mapping out the spread SARS-CoV-2 virus to determine if new strains are emerging in a population or geographic region requires rapid, variant-level detection and analysis, and results from serology tests used for the detection of SARS-CoV-2 antibodies may not be sufficient for these types of studies. The immune system is our body's defense mechanism, which is made up of [armies of B cells and T cells](#). While we know the function of B cells is to create antibodies with specific markers to ward off foreign invaders like the SARS-CoV-2 virus, there's still a lot to learn about what role T cells may play in [SARS-CoV-2 immunity\[1\]](#). Serology tests are used to detect the presence of antibodies in the blood, however antibodies may not always be detectable during early-stage infection when the immune system is still in the process of responding. An added challenge is the factor of the varying degrees of infection severity for SARS-CoV-2, since there are asymptomatic carriers of the virus.

The results of a recent serological survey in Spain[2], one of the countries more severely impacted by SARS-CoV-2, suggests that a majority of the Spanish population is sero-negative to antibodies for SARS-CoV-2, even in hotspot areas. This implies that immunity to SARS-CoV-2 may not be easily achieved as previously thought. Without a clear timeframe for a vaccine in view, there is a need for alternative ways to track SARS-CoV-2 prevalence in a population, since there are still questions regarding how long someone can remain immune to the virus, and how quickly reinfection could occur.



Alternatively, environmental monitoring could be a faster way to track the prevalence of SARS-CoV-2 in a particular region. [Wastewater-based epidemiology \(WBE\)](#) has been used in locations like Italy, Spain, UK and US, as the virus is detectable in sewage samples. Rapid detection of the virus down to the variant-level would be crucial for the prediction of potential hotspots and tracking new emerging strains in real time, as the results could help inform public health measures and containment strategies.

Since the beginning of the crisis, researchers in over 34 countries have been using [Ion Torrent™ targeted next-generation sequencing \(NGS\) solution](#) for SARS-CoV-2 research and epidemiological investigations. The [Ion AmpliSeq™ SARS-CoV-2 Research Panel](#) is a rapid, automated and accurate solution that enables variant-level analysis and >99% coverage of SARS-CoV-2 genome, including all serotypes. This assay is part of a complete nucleic acid-to-analysis workflow that includes powerful yet intuitive analysis tools, allowing NGS to be accessible to any user regardless of their informatics experience.

[Learn more about simple, practical NGS for SARS-CoV-2 epidemiology research](#)

[Explore the comprehensive portfolio of Targeted NGS solutions for studying SARS-CoV-2 viral research, vaccine development research, host genetics and immune response](#)

Reference:

[1] Braun, J., Loyal, Lucie. Et al. Presence of SARS-CoV-2 reactive T cells in COVID-19 patients and healthy donors. medRxiv, 2020.04.17.20061440. <https://doi.org/10.1101/2020.04.17.20061440>

[2] Pollan, M., Perez-Gomez, B. et al. Prevalence of SARS-CoV-2 in Spain (ENE-COVID): a nationwide, population-based seroepidemiological study. The Lancet, 2020.07.06. [https://doi.org/10.1016/S0140-6736\(20\)31483-5](https://doi.org/10.1016/S0140-6736(20)31483-5)

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