

Fighting an Invisible Enemy: Beginning a New Chapter in the COVID-19 Era

Editorial Comment,

The Coronavirus disease (COVID-19) pandemic has disproportionately impacted communities of color and particularly Black and Hispanic individuals.^[1,2] Combined with economic downside sparked by social distancing, the pandemic has highlighted longstanding inequities that have put the health of racial and ethnic minority groups at risk.^[1,2] History has shown that crises have a way of damaging our most vulnerable communities and COVID-19 is no different.

COVID-19 is not just a virus. The clinical disease caused by the novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is the result of a complex and ongoing battle within the body between the invading virus and the body's defense system.^[3,4] Timing really matters when it comes to COVID-19 infection.

The virus enters the nose or mouth to infect the lung cells, where it can replicate first. After the virus invades, the innate immune system responds first, detecting a foreign invader and creating antibodies. For a tactical victory, all the virus has to do is delay immune response by a couple of days, and from 100 infected lung cells on day 1, tens of millions are conquered 4 or 5 days later. But if a virus subverts these early defenses, the body next needs to deploy its special operation forces that have been trained through past experiences, if they had any, to fight the specific invader that the body is facing T cells.^[3,4]

But every step of this battle can ravage the body in its way. COVID-19 disease becomes severe when viruses evade the innate immune system and replicate in the lungs. T cell can help fight the disease. But if that battle rages too large, the fortress of the body can suffer as much as from havoc wreaked by its own troops as from the infection itself.

Currently, the multidisciplinary strategy approach to prevent COVID-19 disease includes^[1,2]:

1. Pressing the need for health-care workers on the front lines
2. Well-being of staff takes top priority
3. Offering COVID-19 tests to community
4. School-aged children behavioral health screenings
5. Discovery of efficacious and safe vaccines.

Basic Science on the Clinical Front Lines: The Future Fight

There are a number of really big questions still open to investigations, including how immune people remain after infection. Immunologists are increasingly examining

how T cells learn to fight the virus effectively but not overzealously. One big area the investigators are focused is trying to understand the formation and quality of T cells' memory. They are also looking at the immune system in COVID-19 patients with long-term symptoms, the relationship of the immune system to vascular problems, and how previous infections might impact our immune response to virus.^[5,6] Further, collaborative and multidisciplinary clinical trials are pursuing how immunity develops in those with milder infections, how long-term protective immunity differs over time, and the implications of those answers for the development of future vaccines.^[7,8]

My heart is broken, but I sustained by hope to save more lives. We are getting through it!

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