

Nanotechnology against COVID-19: Immunization, diagnostic and therapeutic studies

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The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in early 2020 soon led to the global pandemic of Coronavirus Disease 2019 (COVID-19). Since then, the clinical and scientific communities have been closely collaborating to develop effective strategies for controlling the ongoing pandemic. The game-changing fields of recent years, nanotechnology and nanomedicine have the potential to not only design new approaches, but also to improve existing methods for the fight against COVID-19. Nanomaterials can be used in the development of highly efficient, reusable personal protective equipment, and antiviral nano-coatings in public settings could prevent the spread of SARS-CoV-2. Smart nanocarriers have accelerated the design of several therapeutic, prophylactic, or immune-mediated approaches against COVID-19. Some nanovaccines have even entered Phase II/III clinical trials. Several rapid and cost-effective COVID-19 diagnostic techniques have also been devised based on nanobiosensors, lab-on-a-chip systems, or nanopore technology. Here, we provide an overview of the emerging role of nanotechnology in the prevention, diagnosis, and treatment of COVID-19.

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