Inside the quest to develop second-generation vaccines, variant-proof boosters and a shot that works against future pandemics

Even as vaccine supplies outstrip demand in the United States, the scientific quest for coronavirus shots has scarcely eased. In dozens of academic institutions, government laboratories and companies, the pace of work hasn't relented. If anything, it feels busier to many scientists working on second-generation vaccines, variant-proof boosters or the ultimate goal — a vaccine that would work against multiple coronaviruses and stop future pandemics.

The coronavirus vaccine [Colorado State University scientist Izabela] Ragan is working on is more old-fashioned than any authorized in the United States, based on killed viral particles that teach the immune system to rout the live version. It's similar to vaccines against polio and influenza but produced in a new way. If the shots work, they may provide protection against multiple variants. The technique could be used to make vaccines against other pathogens.

Ragan and her colleagues are driven by the conviction that more tools will probably be needed to quell this pandemic globally. But even if that turns out to be wrong, the work they put in now could become the foundation for responding to the next pathogen, or the one after that.

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