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Lessons in vaccine process development

Tara Tagmyer

LESSONS IN VACCINE PLATFORM DEVELOPMENT

Tara Tagmyer, Merck & Co., Inc
Tara_Tagmyer@Merck.com

The biopharmaceutical industry mounted an impressive response to the rapidly evolving COVID-19 pandemic by reprioritizing pipelines and establishing novel collaborations. While most biopharmaceutical companies attempted to develop a vaccine or treatment, it was the companies that previously invested in more platform-based technologies, such as mRNA and viral vectors, that tended to respond more quickly to the evolving situation. As a result, multiple safe and efficacious vaccines were authorized for emergency use, resulting in significant declines in severe disease and mortality. However, durable immunity to COVID-19 has not yet been demonstrated. While the rapid development and deployment of efficacious vaccines is admirable, the latest Global Health Security Index finds that no country is well positioned to respond to future epidemics or pandemics. While health system strengthening and supply chains improvements are needed, continued investment in multiple vaccines platforms is essential to combat the next pandemic. Vaccine platforms offer speed of development and flexibility in manufacturing, however, not all antigens are amenable to a specific platform, and there are strategic trade-offs in developing a vaccine for rapid emergency use deployment vs. a long-term product for endemic prophylaxis. Here we will present learnings from several case studies with live viral, sub-unit, and mRNA vaccine programs which are actively informing development of a three-pillar vaccine platform strategy.