We’re on the cusp of spellbinding advances in treating malaria and tuberculosis thanks to mRNA technology used in COVID vaccine breakthroughs

The successful development of the first mRNA vaccines against Covid-19 in 2020 was an unprecedented achievement in the history of medicine. That success was built on iterative progress over decades, driven by the independent contributions of scientists around the world.

The potential of mRNA vaccines goes beyond the coronavirus. We now want to use this technology to tackle two of the world’s oldest and deadliest pathogens: malaria and tuberculosis. Worldwide, there are around 10 million new cases of tuberculosis every year. For malaria, the medical need is even higher: about 230 million malaria cases have been reported in the WHO Africa region in 2020, with most deaths occurring among children under 5.

The convergence of medical advances—from next-generation sequencing to technologies to characterize immune responses on large data sets—boosts our ability to discover ideal vaccine targets. Science has also made progress in understanding how malaria and tuberculosis pathogens hide and evade the immune system, providing insights into how to combat them.

The ongoing revolution in computational protein structure prediction allows for the modeling of three-dimensional structures of proteins. This is helping us decipher regions in these proteins that are optimal targets for vaccine development.

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