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“Harrington provided a great deal of help in exploring various ways of delivering the drug, and formulating our clinical advancement strategy.”

A COCKTAIL TO POTENTIALLY SHUT DOWN COVID

FOCUS: Multi-virus therapy for COVID-19 and other pandemic-causing viruses.

COVID-19 is caused by the novel coronavirus SARS-CoV-2, which is an RNA virus. This means that unlike in humans and other mammals, the genetic material for SARS-CoV-2 is encoded in ribonucleic acid (RNA).


The COVID vaccines the world has come to know are mRNA (messenger RNA) vaccines. In effect, these drugs teach our cells how to make a protein, or a piece of a protein, that triggers an immune response inside our bodies. Dr. Khvorova and her team have been working with small interfering RNAs (siRNA), a different RNA drug approach that shows great promise as a therapeutic for COVID.

When siRNAs enter cells, RNA-degrading protein machinery present in cells is redirected to bind to and destroy viral RNA.

Thus a virus can no longer replicate inside cells or infect other cells, effectively treating the disease and preventing further infection.

“Infection of epithelial cells of the two major compartments in the lungs seems to be a main cause of COVID-19 development,” Dr. Khvorova says. “In animal studies, we have seen success in silencing COVID in lung epithelia — so we have potentially found a way to significantly reduce the initial rate of infection of COVID and other pandemic-causing viruses, as well as slow disease progression, and convert severe cases to moderate or mild. Further, since viruses can mutate and escape vaccines or other therapeutic interventions, we have developed ‘cocktails’ of various siRNAs that target different regions of the virus, and so improve the chances of effectively combating multiple strains of the virus.”

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