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MODERNA: THE STORY CONTINUES...

Moderna's shares rose sharply today after the company released positive interim Phase 1 data for mRNA-1273, its Covid-19 vaccine candidate. But the story began long before the Covid-19 outbreak appeared.

A few months after its IPO in December 2018, we bought Moderna for our biotech and healthcare M&A certificates at around \$17, on the prospects of its technological platform. Although the mRNA therapeutics field is still unproven with no approved drugs yet, we have always believed that this class of drugs could represent the next generation of drugs. mRNA therapeutics mimic the natural role of messenger RNA: transferring instructions stored in DNA to produce the required proteins. The body becomes a manufacturing plant and the patient makes his or her own drug.

The development of mRNA has made great steps in recent years, but these drugs have become a major focus of interest since the beginning of Covid-19.

More than 100 vaccines are under development against Covid-19, ranging from classic methods to innovative technologies such as those based on messenger RNA. As we wrote in our February 25 note ([Will Moderna find the first vaccine against coronavirus?](#)), we believe Moderna could be the first to reach the Covid-19 vaccine market as early as the end of the year. The biggest advantage over conventional vaccines is manufacturing speed, crucial in these times of pandemic.

Moderna's candidate has been able to move quickly because mRNA vaccines are easier to design than other candidates, they work on one single sequence of the virus rather than the whole virus itself. Once the coronavirus was sequenced, and its genetic information uploaded to a public database, Moderna identified the sequence of a key protein on the surface of the virus, known as the "spike protein", as a good vaccine candidate. The instructions for making this spike protein were encoded into an mRNA that can be administered as a vaccine. The mRNA is taken to the immune cells where it instructs the cells to make copies of the spike protein, as if the cells have been infected by the natural Covid-19. It triggers an immune response (production of antibodies). The approach does not require making the virus itself or the spike protein, which is normally a lengthy and complicated process.

The latest published data showed that mRNA-1273 produced an immune response (antibody production) in eight patients who received a dose, at least equal to what convalescent patients had with the natural virus. Complete data for the 45 patients enrolled on phase 1 are not yet available. Besides, the vaccine was well tolerated and safe. Phase 2 is scheduled to start soon and Phase 3, which will validate the vaccine, could start as early as July. Moderna is supported by the U.S. government and clinical trials are being conducted by the National Institutes of Health. The manufacturing side will be backed by Lonza, which has signed a 10-year partnership with the biotech company. Later, other Lonza production facilities around the world will be prepared and eventually it will be possible to produce up to 1 billion doses of mRNA-1273 per year. Lonza's production facilities complement Moderna's current manufacturing capacities in the USA.

Moderna's Covid-19 vaccine, if approved, could become the proof of concept for mRNA drugs. It could pave the way for several other similar drugs in the future for infectious diseases but also for cancer.

Moderna has a strong pipeline with 23 mRNA-based candidates, 15 of whom are in clinical trials in a wide variety of therapeutic fields (infectious diseases, immuno-oncology, rare diseases, cardiovascular diseases). Each achievement, including positive data and the successful completion of a clinical phase, brings an additional step toward reducing the risks of Moderna's mRNA platform.

Once again, we underline the high potential of Moderna's pipeline, and we believe that the stock still has room for improvement. With several hundred million doses of vaccine injected each year or every two years (depending on immunity) at an average selling price of approximately \$50, the market could be worth more than \$10 billion. The company might fetch a multiple of 5X while all the remaining programs would be likely getting a huge rerate as well.

We are only at the beginning of the mRNA drugs story and Moderna remains one of our top positions in our biotechnology and healthcare M&A certificates.

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