ATLAS IMPACT PARTNERS

IMPACT FOCUS NOTE

The Future of Covid Health Innovations

The Future of COVID Health Innovations

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Atlas Impact Partners believe many of the world's most pressing challenges are resolved by innovative commercial products and services which deliver a globally scalable solution. It is these solutions which gain our attention.

To help promote the impact of these solutions, we intend to produce an ongoing series of commentaries for the impact investing community. We view this effort to share our understanding of both the impact and the commercial promise these products and services deliver as a key component of our mission.

We begin the series today as the pandemic and the related global healthcare crisis provide stark reminders of the critical importance of innovative commercial solutions which address and resolve global challenges in human health and wellness. While the pandemic produced human tragedy, the world was also witness to an unprecedented acceleration in medical technologies with far reaching implications. We discuss two of these developments in this note: mRNA Therapeutics and Localized Diagnostics.

The Broad Promise of mRNA Therapeutics: From COVID Vaccines to Cancer Treatments

Though most well-known for its role in developing COVID vaccines, mRNA has the potential to be a key component of highly effective methods for treating many previously unresolved diseases and conditions. As such, the global healthcare impact is potentially broad, as we discuss below, beginning with oncology.

In oncology, mRNA enables CAR-T therapies and other various immuno-oncology opportunities which utilize the innate power of an individual's immune system to destroy tumor cells. For rare genetic diseases, mRNA can enable CRISPR Cas9 gene editing, next generation base editing and prime editing, and other types of gene therapies. mRNA can also be used acutely to treat certain genetic disorders, where therapeutic mRNA can transiently replace an essential missing or damaged gene. And, most prominently today, the well-known use case of mRNA in the development of COVID-19 vaccines is also being applied to developing vaccines which protect against flu, Malaria, HIV, Zika, Ebola, Shingles, Lyme disease and many other viral maladies.

Although mRNA is an integral part of all cellular processes, prior to the pandemic, it was less well known to the general public than its counterpart: DNA, which is the blueprint of life, where our genetic information is stored and the means by which genetic information is passed down to our children. Importantly, for this discussion, DNA never leaves the cell nucleus, its protective capsule inside of every cell. Thus, the DNA blueprint requires a transmission mechanism to be implemented in our cells. mRNA is that mechanism, as it is transcribed from DNA to create a copy

of the coding for each protein in the human body. These mRNA copies leave the nucleus and become proteins, which go on to orchestrate and execute nearly every function in our cells.

The significant scientific challenge was that once these proteins are made, mRNA is usually degraded as it is no longer needed by the cell - this short half-life had to be overcome. And, mRNA molecules are far less stable than their DNA counterparts, and therefore substantially more challenging to artificially manufacture in the laboratory.

The Pfizer/BioNTech and Moderna mRNA based COVID-19 vaccines marked the first successful and FDA approved mRNA-based therapies. These therapies have been in development for years, and were accelerated to approval during the pandemic.

One of the important innovations that overcame previous challenges and enabled the large-scale manufacture of mRNA as a therapeutic is Maravai Lifesciences' CleanCap technology. CleanCap adds a necessary feature, the "cap", to the final mRNA product which then stabilizes the mRNA and initiates translation into protein. The Pfizer/BioNTech COVID-19 vaccine was the first to commercialize a therapy with this technology, but there are 15 additional Maravai customers using GMP grade CleanCap in clinical trials for an mRNA therapy. Of these clinical stage therapies, 22% represent non-COVID mRNA vaccines and 39% represent mRNA therapeutics, while the remaining 39% are COVID-19 mRNA vaccines. In total, Maravai has 50 customers working with GMP grade mRNA & CleanCap, and over 500 CleanCap customers in the discovery phase of a new mRNA therapeutic. We are encouraged by this pipeline and Maravai's advantage in enabling novel mRNA therapies with the potential to resolve many more of the world's challenges.

Looking ahead, there are many upcoming clinical trial readouts for mRNA therapeutics throughout the rest of this year, including next generation COVID vaccines, CAR-T cell therapies, other cancer therapies, and vaccines for respiratory and latent viruses. We look forward to these readouts with optimism, encouraged by the clinical data presented thus far.

The Future of Medical Diagnostics: Beyond COVID, the Power of Localized Testing

During the Pandemic, a key recent development in public healthcare became apparent: the advantages of delivering diagnostics locally and with greater frequency to individuals. Most prominently, delivering rapid antigen COVID tests for use in the home setting has been a key element in effectively managing the pandemic. While Government support has been important in delivering these tests, we note that test makers, including Abbott, have supported these efforts commercially by continuing to validate the efficacy of tests as new variants emerge. Abbott's BinaxNOW test has been the No. 1 rapid antigen test in the US, and Abbott had distributed over 1.4 billion COVID tests from the start of the pandemic through the end of 2021.

In addition, companies like Thermo Fisher Scientific and Danaher have developed tests for the point of care setting which deliver results faster than before. Thermo Fisher's Accula rapid PCR test platform uses proprietary science to provide results in just 30 minutes. In addition, Danaher plans to continue to build out its Cepheid GeneXpert testing platform, which enables molecular testing with results for most tests available within an hour. And, Danaher plans to expand the test cartridge portfolio to include rapid testing for sexual health, additional respiratory conditions, and combination tests for multiple respiratory pathogens. Though COVID tests receive the most press, approximately half of Cepheid tests shipped in the fourth quarter of 2021 were not COVID-related. Together, by enabling faster and more informed treatment decisions in the point of care setting, these tests will improve health outcomes and the patient experience.

Similarly, in the field of oncology, we are equally encouraged by the increasing adoption of Guardant Health's liquid biopsy tests for blood-based cancer screening, which enables testing for genetic indicators of a tumor in the bloodstream, rather than taking a series of tissue samples. Guardant's diagnostic test offerings span from cancer screening and early detection with Guardant Shield, to treatment selection and optimization with the Guardant 360 portfolio, to recurrence monitoring after treatment with Guardant Reveal. This portfolio includes the first FDA approved blood test for genomic testing to optimize treatment selection in all solid tumors. We are encouraged by the recent launch of Guardant Shield as a Laboratory Developed Test to screen for Colorectal Cancer (CRC). CRC is the second leading cause of cancer related mortality in the US, yet still a third of adults do not complete their recommended CRC screenings. CRC survival rates when diagnosed in early stages are as high as 90%, but once diagnosed in later stages this drops to 14% survival. Worse, underscreening is exacerbated in underserved populations, driving a racial/ethnic healthcare disparity in the survival outcomes of CRC.

The simplicity, non-invasiveness, and convenience of Guardant's blood-based tests position it to make an impact on the screening compliance rate for CRC, ultimately detecting CRC earlier in more patients and addressing the healthcare disparity associated with CRC outcomes in the US. We look forward to full results in the Fall from the current ECLIPSE trial, which we anticipate will be sufficient for the company to submit for FDA approval of Guardant Shield for CRC screening.

We are also optimistic about the continued uptake of Adaptive Biotechnologies' testing assay, ClonoSEQ, for use in clinical oncology minimal residual disease (MRD) management. MRD measures the recurrence of disease after successful cancer treatment and is an increasingly important component of remission management for blood-based cancers. In 2021, Adaptive

delivered over 22,500 tests for diagnostic MRD testing of blood-based cancers. MRD testing with ClonoSEQ is also being vetted for use as a primary endpoint in clinical trials, which could allow for faster, lower cost clinical trials in the oncology space.

As testing increasingly becomes accessible to patients, both in the home and at the point of care, patient diagnostic information not only becomes more accessible, but also more abundant. We are optimistic about a future in which patients and physicians can make more informed treatment decisions armed with the incremental information from these emerging diagnostic testing modalities.

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