Adopting a Proactive Stance

CDMOs will play a vital role in bringing CGT and mRNA technologies to market

https://projects.gbreports.com/united-states-life-sciences-2023/adopting-a-proactive-stance

CDMOs have a crucial responsibility in mitigating future pandemics and bringing new therapies to life. Two therapeutic areas are poised to see incremental growth over the coming decade: Cell and gene therapies (CGT), and mRNA technologies. For the former, the pace of the development of therapies in recent years has been astounding, with thousands of candidates in the pipeline. Now is the time to increase the scale of commercialization of CGT products to accelerate patient access. The promise of mRNA technologies has been demonstrated during the Covid-19 pandemic, with vaccines reaching the market in record time. Contractors and the US government together are now looking at the future and investing heavily in the strengthening of vaccine preparedness.

Making the future of medicines a reality

The potential of CGT to tackle previously untreatable illnesses is limitless, but the road toward standardization of these technologies remains long. There currently are 27 cell and gene therapies licensed by the FDA (as of April 2023), and about 3,726 products currently in the pipeline, according to Lonza. For CGT developers considering regulatory hurdles, limited technical knowledge, and aggressive investor timelines, translating a drug from a biological concept to a scalable treatment can be the largest challenge in achieving commercial success. This is where CDMO divisions that specialize in CGT can make a difference.

The key step in successful CGT relies on the safe and efficient delivery of genetic material into the target cells, which is carried out by packaging it into a suitable vector. Lonza's cell and gene division is amongst the most capable worldwide. In 2022, the Swiss company expanded its CGT development space at its Houston, TX, facility. Its process development team has more than doubled since 2020, making the Basel-HQed CDMO uniquely positioned to leverage tools such as their Nucleofector Technology and Cocoon Platform to industrialize and scale up the CGT manufacturing processes.

Being a relatively new technology, CGT requires expertise in manufacturing novel modalities, whether it is in the autologous, allogeneic, or viral vector fields. But now that the safety of these therapies has been proven and mandated by the FDA – which, by approving PDUFA VII in 2022, will ensure the continuous review of new drug and biologic license applications – the future will be about technology transfers and development. As put by Daniel Palmacci, president of Lonza's Cell and Gene division: "In the past, the main challenge for CGT was to prove safety and efficacy. That is now reversed; developing processes that are commercially viable and appropriate for robust manufacturing is the biggest challenge the industry faces right now."

Infrastructure will undoubtedly remain a challenge for developers trying to bring CGT to market. Indeed, the personalized nature of CGT requires multi-phase manufacturing, patient-specific lots, and personalized quality control using advanced rapid microbial detection. From cleanrooms on demand to consulting services, Azzur Group helps clients implement good practices and approaches to CGT manufacturing. And it seems that this indication will remain a driver of the firm's planned growth across several US states in 2023-2024. Michael Khavinson, managing partner and CEO, explained: "In the CGT field, technologies are so new that they require niche expertise. This is where we come in and offer that hybrid model where we offer the cleanrooms and the services outside of it, such as handling the raw materials."

Looking ahead, the operational scale needed to meet the high demand for CAR-T (chimeric antigen receptor, a cell therapy to treat cancer) therapies will require a larger manufacturing footprint. The highly manual nature of manufacturing autologous CAR-T therapies also suggests CDMOs will increasingly hunt for talent coming out of the US leading universities to, ultimately, rewrite the future of medicine.

"With limited funding and success riding on a handful of molecules, biotechs' business model does not include investment in infrastructure, a sizeable workforce including the skills needed to handle the complexity of drug development, and regulatory milestones. Here, companies like Syngene are bridging the gap. The last two years, the number of emerging biopharma collaborations across our services has grown by 15%."

Jonathan Hunt, Managing Director and CEO, Syngene International

Ensuring future preparedness

Between the NIH, the Biomedical Advanced Research and Development Authority (BARDA), and the Department of Defense (DoD), approximately US$31.9 billion were invested in mRNA vaccine research and procurement during the heat of the pandemic, according to BMJ. Building on the largest ever public investment for a disease, the government, CDMOs, and service providers in the US have dedicated a high level of capital to meet future health-related challenges and ensure vaccine preparedness.

The risks taken in pursuing mRNA technology for Covid-19 vaccines played a significant role in mainstreaming mRNA as a platform. The medical upside could be revolutionary: Regenerative medicines offer the prospect of having personalized vaccines on the horizon. Evonik, which has continued manufacturing mRNA therapies since the pandemic, and BARDA have jointly invested US$220 million in the firm's new lipid production facility in Tippecanoe, Indiana, for mRNA-based therapies in the US. According to Stefan Randl, head of drug substance at Evonik Health Care, this investment was prompted by a strategic need at two levels: "To strengthen the US' vaccine preparedness and to expand our lipid offerings and services for new mRNA therapies beyond Covid-19 vaccines."

Lipid nanoparticle manufacturing is an essential component of the production of mRNA therapies, and the US continues to remain the ideal playground for global CDMOs advancing these technologies. Michael Quirmbach, CEO and president of CordenPharma, saw the firm's large capex investments unfold with success in 2022 and announced a US$60 million investment

at the firm's Boulder, CO, facility for early 2023. Building on the firm's capabilities to answer the world's future lipid and peptide challenges, he shared: "CordenPharma is uniquely positioned to offer end-to-end solutions for peptides and oligonucleotides from sophisticated formulation development using lipids excipients especially suited for Lipid NanoParticle (LNP) molecules encapsulating mRNA and other xRNA-based vaccines."

Covid-19 served as a proof of concept for these types of therapies and their potential to be distributed on a large scale. Biotechs and pharma firms will need CDMOs' know-how and capabilities to scale manufacturing up to unleash the power of genes, cells, and regenerative medicines on the pathway to commercialization.