

## Avantor's Critical Role in Addressing the COVID-19 Pandemic

---

Avantor's mission to set science in motion to create a better world has never mattered more.

To help our customers in addressing the COVID-19 pandemic, Avantor provides critical support for the development and production of leading therapies and vaccines to treat and inoculate against SARS-CoV-2, the virus that causes COVID-19.

We are embedded in life sciences from early-stage scientific discovery to the delivery of life-saving, breakthrough therapies and vaccines to patients around the world, including clinical trial support, commercial scale-up, production and storage – and all steps in-between. Our offerings are foundational to the work of scientists and researchers, enabling innovation across the entire value chain that advances global health and well-being.

### Supporting in Key Areas

#### **We help life science companies fast-track treatments and vaccines for COVID-19.**

- Key participant in Operation Warp Speed.
- Support nearly all vaccines or other therapy candidates globally, including vaccine candidates from leading biopharma manufacturers.
- Differentiated by our high purity products, agility and ability to customize, and global scale, which enables fast access to millions of products for our customers around the world.
- Clinical trial support through customized kitting, logistics and asset management, including direct-to-patient kitting solutions to ensure studies continue through global travel restrictions.

#### **We enable fast, reliable COVID-19 testing.**

- Optimizing lab operations with onsite supply chain management at testing facilities.
- Providing custom kitting solutions for secure sample collection and transportation.
- Supporting sample preparation workflow for PCR tests through our comprehensive offering.
- Supplying reagents to manufacturers and distributing completed testing kits for antigen and serologic-based testing solutions.

#### **We help ensure safety of people, products and processes.**

- Our full suite of more than 100,000 safety and industrial products enable protective measures during the pandemic, as well as during routine lab work and processes to develop safe and effective therapies.

### Our Role in Vaccine and Therapy Development

**Avantor helps drug manufacturers overcome significant challenges bringing therapies and approved vaccines to treat and inoculate against SARS-CoV-2. We provide mission-critical products and services used in the development of leading COVID-19 vaccine candidates, including:**

- Global access to the highest quality products “from beaker to bulk”—cell culture supplements, process chemicals, buffers, excipients, and more.
  - Tools and equipment to rapidly set up large-scale, flexible and cost-effective production facilities by integrating Avantor single-use and fluid-handling assemblies into manufacturing workflows.
  - Access to industry leading, highly regulated ultra-cold (-41°C to -150°C) storage systems and cold chain temperature monitoring throughout shipment and storage to ensure the vaccine doses remain in their prescribed temperature range prior to administration to patients.
  - Onsite supply chain and inventory management of key lab consumables.
-

## We Support Each Vaccine Modality from R&D to Production

Avantor plays a significant role in all the early research phases of vaccines, including sample preparation, transfection, amplification, extraction, purification and storage. In addition, Avantor provides proprietary products – including GMP-manufactured chemicals and single-use products – in leading COVID-19 vaccine candidates across four major modalities:

- Messenger RNA (mRNA) Vaccines
  - The novel nature of this modality requires the creation and scale up of suitable materials that are compliant and of consistent quality.
  - Avantor supports the entire manufacturing workflow with critical raw materials, including endonuclease, transcription enzymes, chromatography media and formulation solvents. Avantor also supplies lipid nanoparticles that enable novel and stable formulations. Avantor single-use solutions are also used throughout the workflow to enable sterile fluid transfer, aseptic sampling, final fill and delivery, and storage.
- Recombinant Protein (rProtein) Vaccines
  - Avantor raw material and single-use products, including media, buffers, reagents, and chromatography resins, underpin the entire vaccine manufacturing workflow of this modality from upstream cell growth and downstream protein purification to final fill and finish.
- Viral Vector Vaccines
  - Avantor supports the entire research workflow to the fill and finish process, providing fermentation supplements and serum in transfection and expansion, buffers and gradients during lyse and purification, and excipients delivered globally to the CMO network established to manufacture these vaccines. In particular, Avantor provides critical processing materials such as high purity low endotoxin sugars.
- Plasmid DNA Vaccines
  - Avantor supports the entire research workflow, supplying buffers and media supplements to the upstream replication and fermentation processes; lyse agents, buffers, and chromatography media to the downstream purification processes; and critical excipients to the final formulation processes.

**Avantor is actively making investments to increase our own cleanroom and manufacturing capacity to enable our customers' ramp up of commercial production of any approved vaccines.**

---