

Bio-Fermentation in Pharmaceuticals



Success in this application can be applied to a variety of other applications with similar challenges

Facts about Bio-Fermentation

- Bio-fermentation is the process of harvesting therapeutic material from biologic sources to produce pharmaceutical products.
- Bacteria, enzymes, proteins, cells, fungi, and plant material are all used to manufacture pharmaceuticals.
- Materials harvested from these sources are used to produce a wide range of products, including antibiotics, hormones, vaccines, and other medications.



Reduce Contamination Risks with Automated Cleaning Systems

The biologic material extracted for fermentation is typically housed in a type of broth, which undergoes temperature and molecular changes as it makes its way through the process. The intended molecular reactions that produce the extricable material are heavily dependent on both pH and dissolved oxygen (DO) values. The pH of the solution must be a precise value based on the reactive nature of the desired protein or cell culture being extracted. The microorganisms present in the broth require certain DO values to be sustained and maintain their role in the fermentation process. This means dosing agents are frequently implemented into the process to maintain these variables at their optimal levels.

Cellular fermentation requires precise conditions in a sterile environment. Many steps are taken to create an environment suitable for the proper molecular reactions to occur. Manually handling probes and other instrumentation risks compromising sterility. Frequent calibrations and manual cleanings can threaten sterility. Weeks of operation may be necessary to obtain the desired reaction and purification. Sensors, transmitters, and hold-

ers must maintain their function for extended periods of time to achieve efficient and sterile fermentation.

Introducing automated systems to the bio-fermentation process enables operators to maximize process efficiency and sterility. The Unclean 900 cleaning and diagnostics system is ideal for the dissolved oxygen needs of bio-fermentation. When paired with the Protos transmitter and a Sensogate or Cera-mat pneumatic retractable holder, the Unclean 900 is the ideal engineered solution for the automatic retraction, cleaning, and insertion of inline process sensors.

Coupling the SE 740 DO sensor with the Unclean allows operators to decrease their reliance on manual cleanings and boost process sterility and performance. For pH measurements, the durability of the SE 555 and automated cleaning, retraction, and calibration capabilities of the Unclean 9000 are ideal for sterility and consistency. Implementing automated pH and DO systems in the fermentation process for the pharmaceutical industry can provide a significant return on investment for customers.

What was this Customer's Return on Investment?

- **Reduced Contamination Risk:** Automation reduces the need for manual interventions, decreasing the risk of contamination. Sterile operations are maintained more effectively, ensuring product safety through a closed system.
- **Optimized Fermentation Conditions:** Automated pH and DO systems ensure optimal conditions for microbial growth and product formation. Consistent maintenance of optimal pH and DO levels can lead to higher yields and faster production times.
- **Resource Efficiency:** Precise control of pH and DO levels reduces the consumption of expensive reagents and raw materials. Efficient use of resources results in cost savings over time.