



Syngene

Putting Science to Work

Biologics Development & Manufacturing

Innovate | Integrate | Customize | Accelerate

When you select Syngene for your biologics program, you partner with a 26 years industry leader solving complex R&D and Manufacturing challenges . With our highly experienced team, state-of-the-art infrastructure, proven track record and a portfolio of product experience, we help you navigate the complex Journey from Discovery to Commercial Supply



**One-stop
service**



**30+ Global
customers**



**Global Clinical
and Commercial
supply**



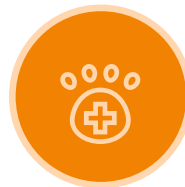
**360+ Technical
staff**



**Dedicated Program
Leader and Project
Management**



**High yield
processes
4-5g/L**



**Experience in
Animal Health**



**9 Months from
Clone to clinical
supply**

Our experience base

- Recombinant Proteins, Protein subunit vaccine, Glycoproteins
- mAbs, Antibody Fragments, Bispecifics
- r – protein vaccine in Baculovirus expression system, mRNA vaccine
- Microbiome (Live Biotherapeutics)

Biologics development and biomanufacturing solutions in both mammalian and microbial systems



Development services

- Developability assessment
- Upstream development
- Formulation screening
- Process characterization
- Viral clearance studies



Integrated FIH development

- DNA sequence to IND supply
- Platform process for mAbs
- CMC regulatory support



Commercial biomanufacturing

- Mammalian mfg to 2kL scale
- Microbial mfg to 500L scale



Cell Line & Process Development

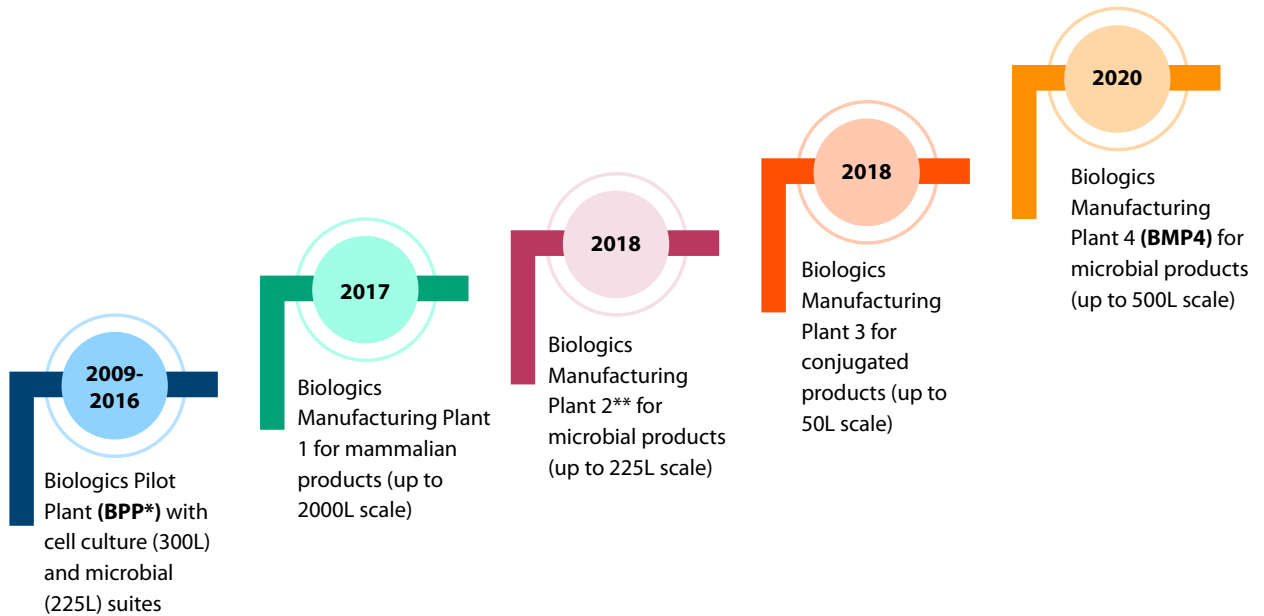
- Mammalian (Freedom™ CHO-S™ Expression and CHOZN®)
- Microbial (E. coli, Pichia P.)
- Clone Pix, Solentim (for Monoclonality) Upstream process: Multi-reactor system for DOEs, 1-50L Bioreactors, ambr® 250, perfusion (ATF), Metabolite profiling, Spent media analysis
- Harvest: Depth & Polymeric Filtration & Centrifugation, Flocculation and filtration in filter-press mode, Microfluidizer
- Downstream: Column Chromatography (IEX, Affinity, HIC, Mixed-mode, AKTA Explorers and Purifiers)
 - Virus reduction steps and clearance studies

Analytical Development and Product Characterization

- Product Characterization: Mass Spectrometry, LC-MS (Glycan and product variants), MALDI-TOF, MS/MS (Ion-trap), CD, Fluorescence, SPR (Biacore), PAMAS (sub-vis), Solo VPE, Flowcam, Maurice (cIEF), HIAC, SEC-MALS, AUC
- Stability Studies: Exploratory, Freeze-thaw, Real-time, Accelerated and Stress (forced degradation)
- Bioassays: cell based, Non-cell based, In vivo, Proliferation, Inhibition, Reporter Gene, Effector Function, Secondary Signaling



cGMP Manufacturing



*Decommissioned

**Leased to a client

End to-End Biomanufacturing from Clinical to Commercial Supply

Mammalian:

- Scale: Single-Use bioreactors 100→500→2,000L trains
- USP: Shake flasks, 1L-50L bioreactors, ambr® 250, perfusion (ATF), Depth and polymeric filtration and centrifugation
- DSP: Column chromatography (IEX, Affinity, HIC, Mixed-mode, AKTA- Process, Explorers and Purifiers) – Up to 800mm column and 2000LPH flow rate

Microbial:

- Scale: Up to 500L (SS) fermentation, 1000L refolding, 60 cm column chromatography and 10 sq.m. tangential flow filtration
- USP: Continuous centrifuge, Cell homogenizer
- DSP: Chromatography systems, TFF systems

Sterile Fill Finish facility (Clinical supply)

Capability to manufacture ready-to-use solutions and lyophilized products (pre-sterilized vials and PFS) OEL: $\geq 1 \mu\text{g}/\text{m}^3$ in GMP environment

- Aseptic filtration and filling
- Sterile filtration and Terminal sterilization
- Batch size of 500 to 25,000 vials, 5L - 50L
- Single use mixing vessels, transfer vessels, tubing for biologics Drug Product
- Lyophilization capability for vials (3500 vials of 10R size)
- Capability to handle clinical batch manufacturing of Small Molecules and Biologic products
- Storage chambers of 2 – 8°C and - 30°C

Equipment:

- Vials+ PFS combi filling line under isolator (Make: MAR Italy)
- Isolator-based robotic filling machine for vials and PFS
- Ready-to-use nested vials: Liquid and lyophilized vials with fill volume of 0.5 ml to 50 ml (ISO 2R to ISO 30 R)
- RTU nested PFS: Fill volume of 0.1 ml to 10 ml
- Terminal sterilizer; Jacket cooling available after sterilization cycle.
- Lyophilizer: Tofflon China (Model: Lyo-3), Grade B area

We are 21 CFR-compliant wherever applicable.



Viral Clearance studies

Salient Features

- Only GLP/GMP Viral testing facility in India, for batch release and viral clearance testing
- Viral clearance studies for cell culture processes for Phase 1 and commercial
- Testing of Unprocessed bulk harvest and Cell bank
 - 28 day in-vitro adventitious virus detection
 - Retrovirus detection by cell-based assay
 - Mycoplasma detection (QPCR based)





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About Syngene

Syngene International Ltd. (BSE: 539268, NSE: SYNGENE, ISIN: INE398R01022) is an integrated research, development and manufacturing services company serving the global pharmaceutical, biotechnology, nutrition, animal health, consumer goods and specialty chemical sectors. Syngene's more than 4700 scientists offer both skills and the capacity to deliver great science, robust data management and IP security and quality manufacturing at speed to improve time-to-market and lower the cost of innovation. With a combination of dedicated research facilities for Amgen, Baxter, and Bristol-Myers Squibb, as well as 2 Mn sq. ft of specialist discovery, development and manufacturing facilities, Syngene works with biotech companies pursuing leading-edge science as well as multinationals, including GSK and Merck KGaA.

For more details, visit www.syngeneintl.com or write to us at fdc@syngeneintl.com

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