Contract Manufacturing and Services

emergent biosolutions®

CGMP DRUG SUBSTANCE MANUFACTURING

Clinical and Commercial Drug Substance Manufacturing

- Single-use Platform
- Manufacturing Capabilities
  – Viral, Mammalian, Avian, Insect
- Mammalian Cell Culture (200L–2000L)
- Viral Vector Vaccine Manufacturing (50L–2000L)
  – Suspension based, Microcarrier based
- Specializing in Protein Therapeutics and Emerging Infectious Diseases (EID) Vaccines

Downstream Processing

- Single-use Systems
- Aseptic Processing
- Depth Filtration
- Chromatography
- Ultrafiltration/Diafiltration

Customer Focus, Communication and Value

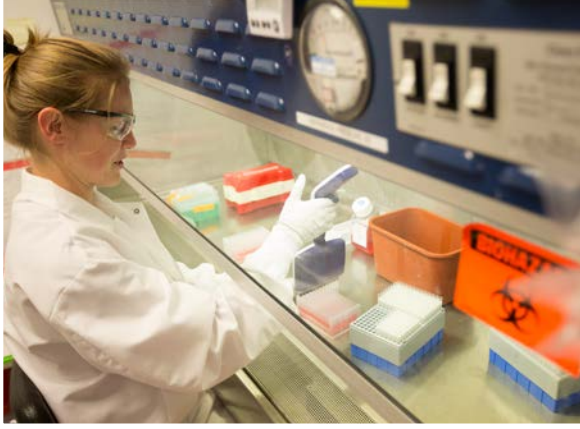
- Drug Substance Formulation
- Technology Transfer Plans (and Reports)
- Process Optimization and Scale-up
- Process Validation

Analytical

- Method Transfer
- Method Qualification and/or Validation
- Product In-process and Release Testing
- Stability Testing
- Raw Material Testing
- Assay Development

Platform Technologies

- Expression Systems Development
- Cell Line and Medium Optimization
- MVAtor™ (modified vaccinia virus Ankara vector) cGMP bulk manufacturing
- Robust single-use manufacturing platform capable of rapid scale-up with flexibility to "scale out" as demand increases



PRECLINICAL DEVELOPMENT | TOX & CMC SUPPORT | PHASE I | PHASE II | PHASE III

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CGMP DRUG PRODUCT MANUFACTURING

Sterile Fill Finish Liquid & Lyophilized Products

Vial Sizes

- 2cc - 125cc (2 filling lines)
- 2cc - 50cc (1 filling line)

Prefilled Syringes

Syringe Sizes

- 0.5cc - 20cc

Production Lyophilizers

- 216 ft²
- 240 ft²

Lyophilization Cycle Development

- Optimization of Critical Cycle Parameters
- Material Characterization
- FDM/FTIR/DSC
- Supporting Stability Studies

Laboratory Services

- Microbiology
- Method Development/Validation
- ICH Stability Testing
- Method Transfer
- In-process and Release Testing
- Raw Material Testing

Process Development & Validation

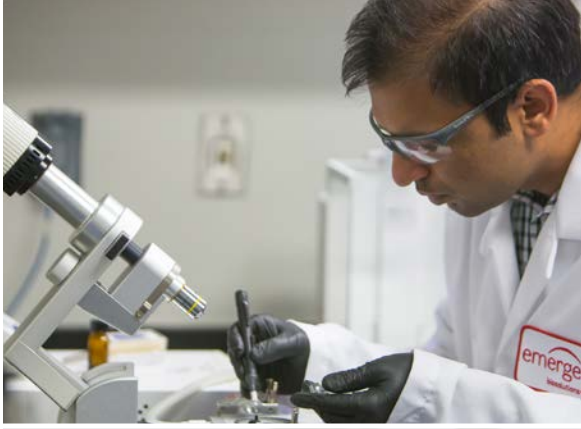
Inspection, Labeling, Packaging & Distribution

Experience with Complex Formulation Types

- Proteins
- Plasmid DNA
- Monoclonal Antibodies

Strong Regulatory History

- Support over 20 commercial products for our clients
- 200 Clinical Candidates Supported
- Expertise with Government Contracts



COMMERCIAL

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Emergent Headquarters

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Emergent Contract Manufacturing Sites

Process Development
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Gaithersburg, MD 20879 USA

Drug Substance Manufacturing (Bayview Campus)
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Baltimore, MD 21224 USA

Drug Substance Manufacturing (Lansing Campus)
3500 N Martin Luther King Jr. Blvd.
Lansing, MI 48906 USA

Drug Product Manufacturing (Camden Campus)
1111 South Paca Street
Baltimore, MD 21230 USA

Process Development & Manufacturing
155 Innovation Drive
Winnipeg, MB R3T 5Y3 Canada

To learn more about Emergent's Contract Manufacturing Services contact us at **CMO@ebsi.com** or **800-441-4225**

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PROTECTING & ENHANCING
50 MILLION LIVES BY 2025

Emergent BioSolutions is dedicated to one simple mission:
TO PROTECT & ENHANCE LIFE

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