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ALTHEA®

THE POWER TO MAKE™

WITH ALTHEA, YOU HAVE THE POWER TO MAKE

You have the power to make a difference. To make new therapeutics that improve quality of life and inspire a healthier world. To do this, you need a manufacturing partner who embraces your every challenge as its own, who shares your unwavering tenacity and dedication from clinical studies through commercial success.

That's The Power To Make.

DEVELOPMENT

PROCESS DEVELOPMENT

Althea's complete range of Process Development capabilities offer the tools to address your needs, whether they be in producing small quantities of proteins for early testing or in developing robust, reliable and scalable processes that will enable a strong commercial advantage.

Althea's highly knowledgeable Process Development team will develop and characterize a robust manufacturing process to ensure consistent cGMP manufacturing performance for Phase I through Phase III, at which point Process Validation is implemented to secure a commercial quality process to deliver reliable product supply.

Working hand-in-hand with the Analytical group, the Process Development team ensures the integrity of your molecule. Once the phase-appropriate process is fully developed, the complete manufacturing method is seamlessly transferred to the cGMP Manufacturing group to initiate scale-up manufacturing.

SERVICES:

- Process Development
- Cell Line Selection
- Fermentation Development
- Recovery & Purification Development
- Phase-Appropriate Analytical
- Development & Validation

CRYSTALOMICS® DRUG DELIVERY

Althea's Crystalomics drug delivery technology utilizes protein crystallization and complexation for the development of sustained release and high concentration formulations. The Crystalomics technology allows proteins and other large molecule products to be formulated as crystals in suspension for subcutaneous delivery. This protein formulation technology enables manufacturers to overcome stability and delivery challenges with drug products that need to be delivered at high concentrations or must be administered frequently. The regulatory compliant process does not alter or modify the protein structure or protein activity.

SUSTAINED RELEASE FORMULATIONS

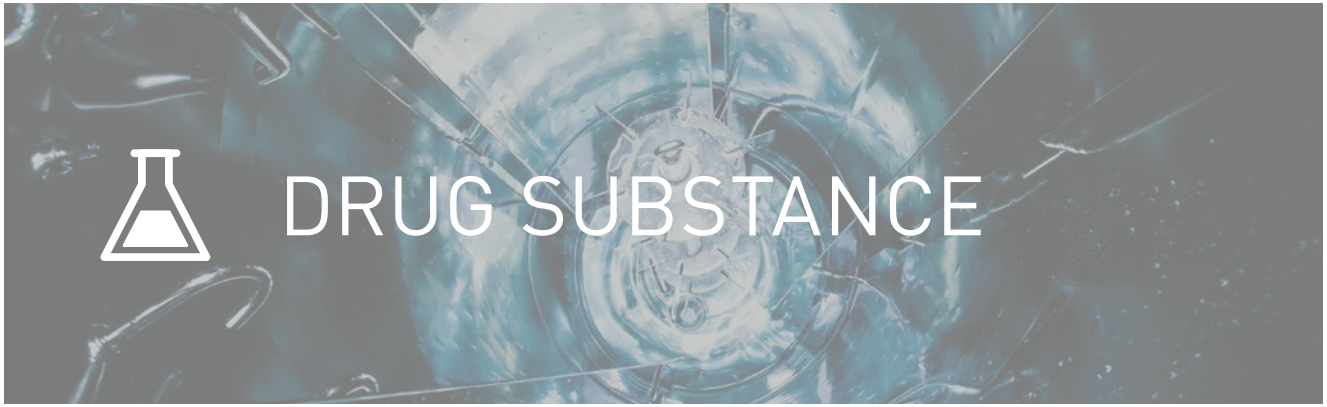
- Reduce dosing frequency & extend half life
- Release times of one week or longer
- Good injectability
- Low initial burst
- Useful for NCEs and existing products to improve stability

HIGH CONCENTRATION FORMULATIONS

- Concentrations up to 400mg/mL
- pK equivalent to IV
- Improved Stability
- Low viscosity

"We allow our clients to sleep well at night because they know there is someone at Althea with their best interest at heart that ensures that we will meet the demands that they are looking for."

- Chris Olson, Manager of Project Management



DRUG SUBSTANCE

BIOLOGICS MANUFACTURING

Althea's focused expertise and capabilities in cGMP production of biotherapeutics make us one of the industry's top leaders for microbial fermentation. Whether it is protein or plasmid production, our experienced staff can take your product from cell banking to final filled product.

Althea provides the capacity and quality to scale your process to larger product volume requirements to take your product through clinical development and commercialization.

SERVICES:

- cGMP Protein/Plasmid DNA Production
- Microbial Cell Banking & Characterization
- Strain Selection & Development
- UpStream
  - Fermentation
  - Product Recovery
- Downstream
  - Yield Optimization
  - Contaminant Removal
- Phase-Appropriate Analytical Services

cGMP Manufacturing:

- 30L, 100L, 1,000L Fermenters
- Microfluidizer
- Homogenizers
- 2,000L Single Use Mixer
- Continuous Centrifuge
- Depth and Tangential Flow Filtration Systems
- Chromotography Systems

CORYNEX® PROTEIN EXPRESSION

The Corynex expression system is an innovative platform utilizing gram-positive *Corynebacterium glutamicum* bacterium, to greatly simplify the production and purification process of complex recombinant proteins and thereby reduces production costs and speeds time to market. This breakthrough, patented system allows for the isolation of higher yields of biologically active proteins with accurate folding, increased purity with fewer host proteins and no endotoxins. By utilizing our proprietary Corynex expression system, Althea minimizes costly purification steps, resulting in improved delivery of peptides and proteins.

"During large scale drug substance manufacturing, oftentimes there will be unpredicted factors that fall outside of the project scope and therefore require scale up optimization specific to that project. At Althea, we will go above and beyond to adapt and do whatever is needed to push forward and ultimately have a successful outcome for the client."

- Dr. Kristin DeFife, VP of Biologics

DRUG PRODUCT

FORMULATION

Althea offers a unique range of formulation and aseptic filling in vials or prefilled syringes to address production needs that span from small scale early stage clinical products to larger scale commercial products.

Complex drug formulations are often required to overcome challenges with stability, efficacy, potency, or safety during clinical and commercial phases.

Althea's dedicated formulation scientists are highly knowledgeable in manufacturing various complex formulations utilizing the following formulation instruments including:

- Dynamic light scattering
- Differential scanning calorimetry
- FT-IR spectroscopy

FORMULATION SERVICES

- Lyophilization Cycle Optimization
- Sustained Release
- Complex Liquid
- Nano-Emulsions
- Liposomes & Nanoparticles
- Suspensions
- Conjugations of PEG & Peptides

VIAL FILLING

Althea offers a comprehensive range of vial batch sizes including various media fill configurations. We employ an aseptic filling process that requires less manufacturing line and minimizes product loss.

FACILITY CAPACITY
- Vials from 0.5 mL to 100 mL
- Clinical batch sizes from 100 to 30,000+
- Commercial batches > 100,000
- Line speeds up to 7,500/Hour

TECHNICAL CAPABILITIES
- Nitrogen overlay
- High speed vial labeling
- Continuous environmental monitoring
- Peristaltic & rotary piston pumping

DOSAGE FORMS
- Parenteral products
- Lyophilized products
- Viscous products
- Suspension products
- Complex formulations of liposomes, adjuvants, crystallized proteins

LYOPHILIZATION

Althea offers cGMP lyophilization in conjunction with our Fill Finish capabilities. We will transfer and adapt your lyophilization cycles to our equipment.

LYOPHILIZATION CAPABILITIES
- Maximum lot size of 6,100 x 2mL
- Vial volumes 2mL to 50mL
- Temperature control as low as 65°C
- Vacuum control between 50 & 1,000 millitorr

SYRINGE FILLING

Althea offers complete pre-filled syringe contract manufacturing services including parenteral manufacturing on our high-speed pre-filled syringe line, utilizing Restricted Barrier Access (RAB) technology to ensure the required sterility for fill finish.

PREFILLED SYRINGE CAPACITY
- Syringe sizes of 0.5 mL to 20 mL
- Maximum lot size: 100,000
- Line speeds up to 13,000/Hour
- Commercial capacity of 30+million units annually
- Glass or polymer syringes

TECHNICAL CAPABILITIES
- Non-destructive fill & in-process weight checks
- Restricted Access Barrier System (RABS)
- Vacuum filling & vacuum piston placement

TESTING FOR PREFILLED SYRINGES
- Break-Free, glide force & injection force testing
- Syringe/Container biocompatibility testing & analysis
- Micro-Flow imaging for sub-visible particle analysis
- Field Flow fractionation (FFF-MALS) for protein aggregation evaluation
- Mass spectrometry
- Evaluation of interactions with silicone oil & tungsten oxides

REGULATORY SUPPORT

REGULATORY COMPLIANCE & QUALITY

Althea maintains an impressive and successful regulatory track record. We maintain this impeccable track record using internal audit teams, regulatory agencies and customer inspections.
Frequent audits and inspections refine the quality of our programs and further warrant the compliance of FDA's cGMP and EU regulations. Our regulatory support team has authored numerous IND/NDA/BLA/eCTD submissions and is ready to help with your regulatory submissions, clinical filings and commercial launch.

QUALITY MANAGEMENT

Althea's quality management system focuses on continuous improvement. We accomplish this through routine reviewing and trending of operational metrics with the senior management team and developing actions to drive optimization of processes.
We strive to provide our customers with a strong yet flexible strategy and show our customers that we are inspection ready at all times.

REGULATORY HISTORY:

9 FDA Inspections

>30 Qualified Person (QP) Audits

5 Pre-Approval Inspections

EU GMP Certificates

- Analytical Development
- Fill & Finish Vial Filling Lines/QC Micro/QC Chemistry

ANALYTICAL SERVICES

Althea's well-designed analytical programs satisfy regulatory requirements and work to assure the success of the clinical program. Althea offers core services of method development and validation, product characterization, comparability studies, reference standard qualification and stability and release testing.

Our analytical scientists customize phase-appropriate analytical programs to the specific needs of your unique molecule delivering a comprehensive understanding and characterization of the molecule for each stage of development and commercialization. We support you in making process changes that are necessary for successful formulation, drug delivery and fill finish.

Althea's on-site laboratories are equipped with sophisticated analytical instrumentation, enabling scientists to employ a full range of methodologies and techniques to characterize your product and develop test methods that will validate your product's integrity throughout its life cycle.

ANALYTICS CAPABILITIES

- Method Development
  - Qualification & Validation
  - Product Characterization
  - Reference Standard Qualification
  - Comparability Studies
  - Stability Assays
  - Product Release Testing

ANALYTICS EXPERTISE

- LC-MS and MS/MS
- Circular Dichroism (CD), FT-IR
- HPLC, SDS-PAGE, cIEF, LC-MS
- A4F-MALLS, SEC-MALLS
- LC, LC-MS, LC-MS/MS
- ELISA, Western Blot
- UV/MALLS/RI
- MFI, DLS

IT'S TIME TO EXPERIENCE THE POWER TO MAKE

Althea is a fully integrated contract development and manufacturing organization providing clinical drug process development and manufacturing services to global biotechnology and pharmaceutical companies. But what truly differentiates us is our quality product, personalized service and the ability to provide the flexibility and guidance needed to achieve your goals. We're looking forward to hearing from you.

Info@AltheaCMO.com **1-888-425-8432** www.AltheaCMO.com

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A MEMBER OF THE AJINOMOTO GROUP

Ajinomoto Althea, Inc.
11040 Roselle Street
San Diego, CA 92121

Toll-free: (888) 425-8432
Local phone: (858) 882-0123
Fax: (858) 882-0133

AltheaCMO.com