Millipore®
CTDMO Services

ADCs, Bioconjugates, and Bioorganic Small Molecules

St. Louis Facility Overview

Our St. Louis (USA) manufacturing site has more than 35 years of experience in bioconjugation, APIs, excipients and adjuvants manufacturing. Extensive analytical capabilities and dedicated compliance resources, along with innovative manufacturing capabilities, help our customers around the globe accelerate their drug development programs.

ADCs and Bioconjugates

Bioconjugates are molecules that contain a targeting agent chemically linked to a payload, where at least one component is a biomolecule. Among the different classes, antibody-drug conjugates (ADCs) are the most advanced bioconjugate therapies, specifically for oncology indications. ADCs use monoclonal antibodies (mAbs) to deliver highly potent APIs (HPAPIs) to targeted cells. In conjugated form, HPAPIs exhibit more selective cytotoxicity, thereby sparing non-target cells from many of the toxic effects, improving the safety profile.

Today, the ADC pipeline includes emerging subclasses of bioconjugates that vary by antibody format (e.g. fragments or bispecifics) and payloads (e.g. non-cytotoxic small molecules, oligonucleotides, chelators). Choice of components together optimize therapeutic effect.

ADC and Bioconjugation Capabilities

Our St. Louis facility is a Center of Excellence for ADCs and bioconjugates with established CDMO services for over 15 years. We have the expertise needed to deliver solutions for your ADC or bioconjugate.

- IND-enabling services, clinical cGMP production, PPQ/validation, and commercial cGMP production
- 85+ constructs and 600+ development batches and 200+ cGMP batches, with extensive chromatography experience
  - Random cysteine or lysine conjugation technology
  - Site-specific conjugation via engineered mAbs, chemical methods, and enzyme-mediated methods
  - Diverse payloads:
    - HPAPI/cytotoxic: maytansines, auristatins, SN-38, camptothecins, PBDs, tubulysins, calicheamicin
    - Non-cytotoxic: chelators for radioisotopes, oligonucleotides, immune stimulants, antibiotics, polymers, dyes
  - Drug-linker solubilization, including ChetoSensar™ technology
- Analytical capabilities for characterization, including mass spectrometry and cell-bases assays
- Stability and release testing for both Bulk Drug Substance (BDS) and Drug Product (DP)

ADC and Bioconjugation Capabilities

Cytotoxic (Highly Potent) Bioconjugates			
QTY	**Equipment**	**Capacity**	**Temp Range**
1	Clinical ADC Suite	10 to 500 L	2 to 37 °C
1	Commercial ADC suite	600 L max	2 to 37 °C
6	Mobius® FlexReady TFF systems	up to 500 L	
6	Mobius® Single Use Mixers	50 to 100 L	
1	Mobius® Single Use Conjugation Reactor	up to 500 L	
	WFI supply system		
2	AKTA™ Ready (1× XL) Chromatography Systems		
	Bulk Fill Room (Grade C)		
	GE 6610 Autoclave		
3	Biosafety Cabinets (Grade C and Grade B)		

Non-Cytotoxic (Non-Potent) Bioconjugates			
QTY	**Equipment**	**Capacity**	**Temp Range**
2	Jacketed Reactors	2,500 L	2 to 37 °C
2	Portable Equipment	up to 1,000 L	
6	Mobius® FlexReady TFF systems	up to 500 L	
6	Mobius® Single Use Mixing System	50 to 100 L	
1	Mobius® Single Use Conjugation Reactor	up to 500 L	
	WFI supply system		
2	AKTA™ Ready (1× XL) Chromatography Systems		
3	Biosafety Cabinets (Grade C and Grade B)		

Small Molecule API Capabilities

This facility is focused on the synthesis and purification of bioorganic materials such as polyamino acids, liposomes, polynucleotides, and lipids.

Bioorganics			
QTY	**Equipment**	**Capacity**	**Temp Range**
6	Glass lined reactors	50 L to 3,000 Gallons	-9 to 120 °C
2	Filter Dryer	0.6 to 2 m^2	-9 to 120 °C
3	Walk in Hoods	50 L reactors	Plant operating temperature 17 °C
	Chromatography		
	Hastelloy Centrifuge	Capacity is 120 kg	Ambient
	Lyophilization	200 L	-50 to +30 °C

Process and Analytical Development

Our supporting services include developing robust analytical methodology platforms supporting all cGMP manufacturing areas:

- State-of-the-art analytical methods for characterization of bioconjugates and bioorganic small molecules
- Bioanalytical methods for product functional characterization – binding, enzyme and cell-based assays
- Retrofitted methods for next-generation bioconjugates
- ADC Express™ Services for preclinical candidate selection

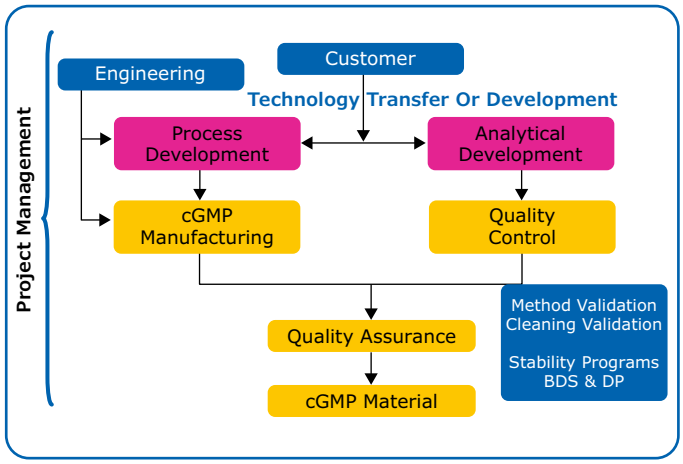
Quality Management and Compliance

Our offer includes extensive regulatory expertise in quality, compliance, and regulatory:

- ICH Q7 is our Quality System and the Global standard for the manufacturing, testing, packaging, and release of APIs
- ISO 9000 cGMP-compliant operations
- 21 CFR 210/211 is in place for contract Drug Product testing for our customers
- First FDA registered site in North America for commercial ADC production since 2015

cGMP Program Workflow

From evaluation to execution, our dedicated project managers are coordinating multi-disciplinary teams, international site activities, and timelines throughout the lifecycle of your program. As the interface between Development and Operations, the MSAT team ensures a successful and consistent tech transfer to cGMP.



For additional information, please visit
SigmaAldrich.com/services/contract-manufacturing/high-potent-apis
To place an order or receive technical assistance, please visit
www.sigmaaldrich.com/ADC-API-CTDMO-Contact

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