Overview

Lonza established the concept of custom manufacturing over 25 years ago, recognizing the trend toward outsourcing in the pharmaceutical industry. Since then, Lonza Custom Manufacturing has been helping both emerging and established pharmaceutical and biopharmaceutical companies improve and advance their products.

Whether for pre-clinical, clinical or commercial supply, Lonza’s broad technology platforms, complete range of development services, and cutting-edge manufacturing processes enable your products to reach their full potential within a desirable timeframe.

Lonza at a Snapshot
Dedicated custom manufacturing organization (CMO)
Proven track record (over 25 years)
Focus on the life-sciences market
Worldwide, multi-product cGMP facilities
Pre-clinical to commercial supply
Full R&D service provider

Five Key Technologies
Advanced Chemical Synthesis
Peptide Synthesis
Microbial Fermentation
Mammalian Cell Culture
Cell Therapy

Complete R&D Services
AggreSolve™ Protein Aggregation Predictor
Epibase™ Immunogenicity Prediction Platform
Tripole™ Protein Engineering Platform
Potelligent™ CHOK1SV Cell Line
The GS Gene Expression System™
XS Microbial Expression Technologies™
XSpedite Microbial Services™
Cell Line / Strain Design
Route selection
Bio/Catalyst Design
Analytical Development
Custom Medium Optimization
Process Development & Scale-Up
Process Validation & Transfer
Purification Development
Technology Development
Regulatory Support

Broad Product Experience
APIs & HAPIs
Advanced intermediates
Monoclonal antibodies
Antibody fragments
Recombinant proteins
Cell-based therapeutics
Antibody drug conjugates
Vaccines
Plasmid DNA
Peptides
Fine chemicals
Custom cell culture media
Custom downstream buffers
Water for injection
Lonza is one the world leaders in exclusive contract manufacturing of monoclonal antibodies and recombinant proteins using mammalian cell culture. Our unmatched experience, first-class cell culture capabilities, and dedicated project management teams ensure our customers – large and small – receive high-quality, secure supply on time and on budget.

At Lonza, we are committed to our customer’s success, so it is our mission to ensure your product reaches its full potential. Our approach is based on providing a comprehensive yet flexible development and manufacturing package created through close interactive partnerships with our customers.

Lonza’s process R&D services range from lead optimization and cell line development to full-scale manufacturing. These include a complete range of analytical services and regulatory support for clinical trials and in-market supply. Our customers regularly ask us to perform tailored work packages or the complete development program. And by using our continually upgraded, highly efficient and regulatory-accepted GS Gene Expression System™, we are able to achieve higher titers, while improving speed to market, safety and costs.

As a full service provider, Lonza offers fully customized specialty and serum-free media to allow for complete expression system optimization. Our custom bioprocess containers provide a safe and effective method for storage, harvest or waste disposal during your cell culture process. From design to final production, Lonza can provide you with effective, high-quality mammalian cell culture systems.

Europe
Slough, UK
200 L to 2000 L
(single-use, stirred tank and airlift bioreactors)

Porriño, Spain
multiple 10 000 L
(stirred tank bioreactors)

North America
Portsmouth, New Hampshire, USA
1 500 L to 20 000 L
(stirred tank, airlift and perfusion bioreactors)

Asia
Singapore
multiple 20 000 L
(stirred tank bioreactors, on-line in 2011)

Technologies & Product Experience
- The GS Gene Expression System™
- AggreSolve™ Protein Aggregation Predictor
- Epibase™ Immunogenicity Prediction Platform
- Tripole™ Protein Engineering Platform
- Potelligent™ CHOK1SV Cell Line
- Monoclonal antibodies
- Recombinant proteins
Lonza’s experience in microbial fermentation began in 1983 with R&D activities in Switzerland. After building small- and large-scale capabilities, Lonza strengthened its offering by acquiring multiple small- and mid-scale trains in the United States. Today, Lonza offers a broad range of cGMP manufacturing and development services for microbial biopharmaceuticals.

We have successfully delivered clinical-grade material of many types of microbial parenteral API including launched products. From established pharmas to emerging biotechs, our customers repeatedly turn to Lonza for reliable and high-quality deliverables.

At Lonza, we know that drug development can be very dynamic, and throughout the years we have developed the sophisticated know-how to adjust our project plans as your needs evolve. Whether you’re preparing your biotherapeutic for the clinic or the market, Lonza can provide an innovative manufacturing solution for you.

**Injectable Grade**

**Europe**
Visp, Switzerland *
20 L to 15 000 L

**North America**
Hopkinton, Massachusetts, USA *
40 L to 2 800 L
(three trains with dedicated downstream rooms)

**Technologies & Product Experience**
− XS Microbial Expression Technologies™
− XSpedite Microbial Services™
− Antibody fragments
− Plasmid DNA products
− Recombinant proteins
− Vaccines

**Oral Grade**

**Europe**
Kouřim, Czech Republic
15 000 L to 75 000 L

**Technologies & Product Experience**
− XS Microbial Expression Technologies™
− XSpedite Microbial Services™
− Therapeutic proteins (oral grade)

* Process development/technical support (US & Europe)
Lonza offers custom fermentation services to supply APIs and intermediates for the biopharmaceutical, pharmaceutical and nutrition markets. Lonza provides R&D services and multi-purpose manufacturing facilities in Kouvím, near beautiful Prague, in the European Union. Here your biopharma product is taken from process development and validation to large-scale manufacture (up to 75 000 liters), including chromatography, lyophilization, etc.

In Kouvím, we also offer lyophilization of BSL-2 strain biomass up to 15 000 liter scale and 10m³ crystallizers that yield 1-2 metric tons. The validated high-throughput design of our plant allows for efficient and flexible delivery of your material requirements as a concentrated, vacuum-dried, spray-dried or lyophilized bulk material.

In cooperation with our chemical services in Visp, Switzerland, we can execute complex semi-synthetic production orders, and our process development and technical teams can provide additional support.

**Europe**

**Kouvím, Czech Republic**

15m³ to 75m³
(total reactor volume over 500m³)
FDA approved, cGMP, HACCP, FAMI-QS and other standards
Process development services

**Visp, Switzerland**

Process R&D services and technical support

**Technologies & Product Experience**

– XS Microbial Expression Technologies™
– XSpedite Microbial Services™
– Therapeutic proteins (for oral & topical applications)
– Secondary metabolites
– Modified peptides
– Carbohydrates
– Enzymes
– Biotransformation products
– Lyophilized or frozen biomass

**Microbiological Experience**

*E. coli, Pichia, Hansenula, Pseudomonas, Saccharomyces, Aspergillus, Bacillus, Streptomyces, Trichoderma*, and a dozen other microbial species, including GMO and BSL-2 organisms.
Lonza has a long and established track record of exclusive peptide manufacturing for the pharmaceutical, nutraceutical and cosmeceutical markets. We have small- and large-scale cGMP manufacturing capabilities in Braine (Belgium), Kouřim (Czech Republic), Nansha (China) and Visp (Switzerland).

Lonza has proven to be a reliable custom manufacturer with all three peptide manufacturing technologies (solid-phase, liquid-phase and recombinant DNA), while covering the breadth of services for clinical trials, launch and in-market supply.

In addition, we also provide a complete range of in-house analytical and development services, as well as full regulatory management support.

Peptides

**Europe**

**Braine, Belgium** *
- solid-phase and liquid-phase technology

**Kouřim, Czech Republic** *
- recombinant DNA technology

**DNA technology**

**Visp, Switzerland** *
- solid-phase, liquid-phase and recombinant DNA technology

**Asia**

**Nansha, China** *
- solid-phase and liquid-phase technology

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**Technologies & Product Experience**

**Solid Phase**
- FMOC chemistry
- 5–50 amino acid long peptides
- Natural / synthetic amino acids

**Liquid Phase**
- BOC chemistry, short peptides

**Recombinant**
- by fermentation CONCATemer approach

* preclinical to commercial supply
Chemical synthesis for small molecule manufacturing is one of our key competencies. While many manufacturers focus their attention exclusively on biologics, Lonza recognizes that chemistry still represents 70-80% of the drugs on the market and in late-phase development. A well-rounded custom manufacturer will embrace the current market excitement of biologics while leveraging and innovating advanced chemical synthesis to adopt a broad, balanced portfolio of technologies. Using the latest chemical processes, we offer our customers exclusive synthesis of fine chemical intermediates, APIs, HAPIs and antibody drug conjugates under full cGMP requirements for use in pharmaceutical products.

Since 1897, Lonza has been investing in advanced chemical technologies and state-of-the-art facilities. Our modern chemical technology toolbox is based on a broad range of expertise at each of our manufacturing sites in Europe, North America and Asia. We have additional non-GMP facilities capable of manufacturing intermediates and building blocks for many different industries.

By optimizing synergies that exist between biotechnology and classical chemistry, Lonza provides alternative and innovative manufacturing pathways. Our production capacity ranges from gram to multi-ton quantities.

**cGMP Facilities**

**Europe**

**Visp, Switzerland** *
Kilo Lab: 10 to 30 L vessels
Small-Scale Plant: 16 reactors (up to 250 L)  
Launch Plant: 27 trains, 57 multi-purpose reactors (250 to 3000 L)  
Commercial Scale: 6 multi-purpose plants with 10m³ reactors  
Phosgene plant (630 to 10 000 L)  
HPAPI plant (10 to 10 000 L)  
MicroReactor technologies (lab to commercial scale)  
Antibody Drug Conjugate plant (10 to 600 L)

**Asia**

**Nansha, China**  
Small Scale Plant: 6 reactors (up to 250 L)  
Commercial Scale: 6 multi-purpose trains (10m³–16m³ reactors)

* Low temperature capabilities at all scales
Cell Therapy

One of the largest contract manufacturers of biologics in the world, Lonza is the global leader in cell therapy manufacturing. Lonza delivers the technical expertise and state-of-the-art manufacturing capabilities you need, with an unrivaled commitment to large-scale production.

With more than 40 years experience with normal human cells (Clonetics® and Poietics®), Lonza Cell Therapy helps clients in all phases of cell therapy commercialization maximize the return on their research investments. From tissue acquisition support and process development to full-scale cGMP commercial manufacturing, our staff can design, develop, and implement a manufacturing process that meets your needs for tissue engineering and autologous or allogeneic cell therapy. Our experience includes manufacture and testing of master and working cell banks, patient dose manufacturing from small to very large scale, regulatory support, medium optimization, and a host of other services.

North America
Walkersville, MD – USA
ISO Class 7 (Class 10,000)

Europe
Vervier, Belgium
EU ISO Class 5 (Class B)

Asia
Singapore
ISO Class 7 (Class 10,000)
(on-line in 2011)

Products & Services
- Tissue acquisition
- Cell isolation
- Custom medium optimization
- Process development
- Cell therapy manufacturing
- Custom bioassays
- Regulatory support
Contact Sales & Marketing

We welcome the opportunity to be challenged by your manufacturing requirements. Whether you have immediate or long-term needs, Lonza is ready to help find a custom manufacturing solution for you.
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Lonza Ltd
Muenchensteinerstrasse 38
CH-4002 Basel, Switzerland
Tel +41 61 316 81 11
contact@lonza.com

Lonza Inc.
90 Boroline Road
Allendale, NJ 07401
Tel +1 201 316 9200
contact.us@lonza.com

www.lonza.com