Microbial master cell banking
Safe, reliable and high quality services
to ensure the integrity of your cell line
Quality starts at the beginning

The safe and reliable preparation of cell lines is of great importance. It ensures the integrity of the product during its development and allows for consistency during commercial production.

Establishing a cGMP master cell bank (MCB) and working cell bank (WCB) is considered the first critical step for quality microbial biopharmaceutical production.

Lonza offers cGMP-compliant master and working cell banking services to customers who have a strain they wish to transfer to Lonza or who are using Lonza’s process R&D service platforms for strain development. Whether it is cell line development, individual cell bank characterization, or testing and storage services, our experienced team will be ready to meet your cell banking needs.

The Lonza cell banking service

- Newly established, dedicated cGMP facility
- Qualified and validated equipment
- Testing and control of all raw material
- Full documentation to control all activities and aid traceability
- QA management for supervising all quality relevant aspects
- Qualified for bio-safety level 1 and 2
- GMP clean room level grade A (at Lonza level 3) in C (at Lonza level 2) for open culture handling
- Shared glass ware area for media preparation cGMP grade D (at Lonza level 2)
- ICH Q7, ICH Q5, and ICHQ6

Master and working cell bank preparation

The MCB and/or WCB are prepared from a customer’s R&D cell line or an established fully characterized parental cell bank. Through amplification one parent cell culture is expanded to a set of identical cultures, which serves as a seed for amplification to master and working cell cultures.

The MCB is produced under standard conditions because it is the starting material for all production campaigns. It must be characterized according to specific strain features to ensure the strain’s identity and it should also be demonstrated that the cell bank is free from adventitious contaminants.

The WCB is prepared from one or more master cell cultures and tested in a similar way to the MCB before being used directly as a seed for the production run.

Following regulatory guidelines Lonza's cell banking campaigns are performed according to project specific SOPs and batch records tailored to the specific requirements. The culture preparation process is clearly documented so that the process is fully traceable.
Culture control testing

Lonza always tests the first, last and two randomly chosen vials of a cell bank for selected strain and culture features. Only cell lines that have been adequately characterized and tested are released for production.

The following standard tests are performed with selected MCCs and WCCs:

**Culture viability**
Growth performance and living cell count

**Strain identity**
Microscopic imaging, macroscopic inspection, MicroSeq ID analysis, and specific biochemical features and enzymatic activities, etc.

**Genetic stability**
Mitotic marker retention (in vitro cell age during storage), plasmid preparation or rescue for restriction site mapping, target gene sequencing, copy number (plasmid or chromosomal integration) and PCR and Southern blot techniques to demonstrate the stability of recombinant co-integrates

**Purity**
Testing for adventitious bacteria, fungi and phage infection (the last on request or if suspected)

**Use testing (only for WCBs)**
Growth performance, product formation and product identity, and stability after expanded fermentation (in vitro cell age during cultivation)

Cryo-storage

Lonza offers dual-site, temperature-controlled storage at below – 65 °C, – 115 °C or at – 180 °C (liquid nitrogen dewar). We always prepare a stock of reference cultures for culture control testing and a set of lyophilized cultures for safety deposit. Additionally, we offer deposition at a public culture collection under Lonza’s or the customer’s access control.

What does Lonza require from the customer?

Before starting a cell banking activity, Lonza requires the following information and documents from the customer:

**Required information for a recombinant production strain (example)**

<table>
<thead>
<tr>
<th>Host strain</th>
<th>Source of cells [laboratory, culture collection], references and literature</th>
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<tbody>
<tr>
<td></td>
<td>– Species and strain ID</td>
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<tr>
<td></td>
<td>– Genotypic and phenotypic characteristics</td>
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<td>– Pathogenicity, toxin production</td>
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<thead>
<tr>
<th>Donor</th>
<th>Source of coding DNA sequence [organism, synthetic cDNA]</th>
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<tr>
<th>Vector</th>
<th>Source and relevant functions of expression construct</th>
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<td></td>
<td>– Description of the vector [name, size, origin, compatibility group]</td>
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<td></td>
<td>– Map of the recombinant construct showing relevant genetic elements, restriction sites and selective marker genes</td>
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<td></td>
<td>– Expression elements [promoter, operator, terminator and leader sequences for secretion]</td>
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<td>– Sequence of target DNA and flanking regions or complete DNA sequence of the recombinant construct</td>
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<tr>
<th>Documentation</th>
<th>Statement on the origin or construction of strain and proof of ownership</th>
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<td>– Previously issued safety registrations with authorities or risk assessments performed</td>
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<td>– Information on the type of cell line required [parent cell bank, master cell bank, working cell bank, R&amp;D cell bank]; Note: Lonza always prepares reference cell cultures [RCCs] and lyophilized back-up cultures</td>
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<td>– SOPs and batch records for the preparation and testing of the provided cell line, if available</td>
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<td>– Instructions on specific methods required</td>
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The Lonza master cell banking facility

The MCB facility is an access-controlled classified clean room area with two separate cell bank-preparation areas dedicated to the cell lines being prepared during the campaign, a media preparation room and two personnel airlocks for gowning.

The cell bank preparation areas are classified as Lonza level 3 in Lonza level 2 facilities (fulfilling cGMP grade A and C specifications).

The Lonza microbial culture collection

Lonza stores more than 3,000 individual microbial strains from different sources. These strains are derived from in-house screening and recombinant strain design projects but also from culture collections and commercial sources. Many of these serve as additional control and reference strains during cell banking campaigns. Standard control strains and wild types according to USP are also available.