Making the Medicines of Tomorrow

Lonza
Integrated Biologics

Reliability today, innovation for tomorrow.

GS Gene Expression System®

Powering the development of biotherapeutic proteins from discovery to commercial

Reliability today, innovation for tomorrow

Emerging and small biotechs play a critical role in driving scientific innovation, often advancing bold ideas with the potential to transform patient outcomes. At Lonza, we understand the unique challenges you face – maximizing limited resources, navigating accelerated timelines, securing funding, and managing scientific and technical risks. We continuously innovate our cutting-edge technologies to help de-risk your journey from early discovery through to IND and beyond, helping you to stay one step ahead of the next challenge.

100+
commercial products powered by Lonza expression systems

Decades
of biologics expertise

High titers
up to 9 g/L for a range of molecules

Excellent
product quality and expression stability

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Lonza in Your Lab®

With the **Lonza in Your Lab®** offering, you can take our proven technologies into your own lab for biotherapeutic development via a research license.

Contact us today to speak to an expert about our licensing options: **licensing@lonza.com**

Why choose Lonza's GS Gene Expression System®?

Easy-to-use, high performing expression technologies, with expert support

- Access to the collective 130+ years' experience of our dedicated GS® technical support experts
- Proven to express a diverse range of molecules with high titers up to 9 g/L

Help de-risk your molecule's development path

- Extensive track record of regulatory approval worldwide with 100+ commercial products made using Lonza expression systems
- Using a proven expression system from an early stage can help to de-risk the development journey

We understand that things can change, that's why we offer flexibility

- The GS System® is portable* – manufacture at Lonza, your own facilities or a range of CMOs
- Flexible licensing terms
- Full compatibility with Lonza's services offering – opt-in at any stage from discovery to commercial

Access to continual innovation that helps you to stay one step ahead of the next industry challenge

- Our latest launch, the novel LHP-1 gene promoter, as part of the GSquad® Pro vector system can boost titers, reduce recovery times and deliver excellent product quality and expression stability

*Subject to the terms and conditions of the license agreement

One toolbox from discovery to commercial

With the GS System® offering you can streamline development from discovery to commercial manufacturing by using the same cell line, vectors and technologies from transient expression through to stable clones.

The GS System® from Lonza offers:

- Confidence in GMP readiness, scalability, product quality, and stability from the start
- No cell line switch later in development – helping to avoid rework, delays, and added costs
- Familiar to regulators globally
- Strong GMP track record may appeal to investors
- Used in Lonza's CDMO services, enabling on-demand expert technical support
- Full compatibility with Lonza services from early development to manufacturing so you can opt in to these at anytime
- Access to the latest GS® innovations developed at Lonza*

*Subject to the terms and conditions of the license agreement
Additional fees may apply

Host cells

- GS Xceed® CHOK1SV GS-KO®
- GS Effex® FUT8 KO

Technologies and systems

- GS piggyBac® transposon technology
- GS Discovery® transient expression platform
- TheraPRO® CHO Media System

Vectors

- GSquad® Pro vectors
- GSquad® constant region vectors
- GS® site-specific conjugation vectors

Know-how and support

- Know-how via exclusive GS® manual portal
- Technical, process and regulatory support
- AI-powered GS® virtual assistant

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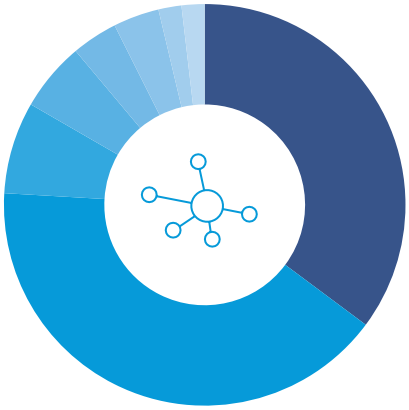
Proven expression for a range of therapeutic protein formats

Maximize the likelihood of success in your bioproduction projects by choosing an expression system with a proven track record of successfully expressing a wide range of molecule types. A versatile and reliable system can help to reduce development risks, accelerate timelines, improve scalability, and support consistent, high-yield expression throughout the development path.

Product types expressed at Lonza in 2023 for discovery and early development



35%	Antibody	4%	Fusion protein
40%	Bispecific antibody	4%	Fab-based
7%	One-armed antibody	2%	Recombinant protein
6%	Fc-fusion	2%	Non-human antibody

20+
commercial products are non-mAbs or advanced antibody formats

2000+
products expressed with the GS® platform in-house since 2012

>60%
of products expressed by Lonza in 2023 were non-mAbs*

*For discovery and early development

With vast experience in expressing a wide range of therapeutic protein formats, we offer expert support to help you overcome any expression challenges. Our dedicated team understands the complexities involved at every stage of development and can guide you through troubleshooting and optimization as needed. Whether you're working with bispecific antibodies, fusion proteins, or novel biologics, our proven expression systems and hands-on expertise help to ensure you have the tools and support needed to advance your therapeutic protein development with confidence.

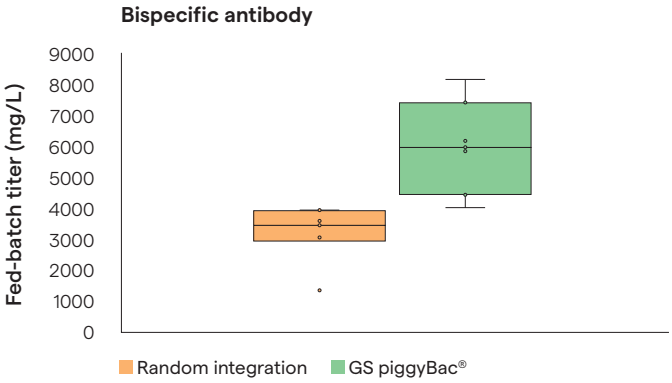
Advanced technologies to support more robust bioproduction

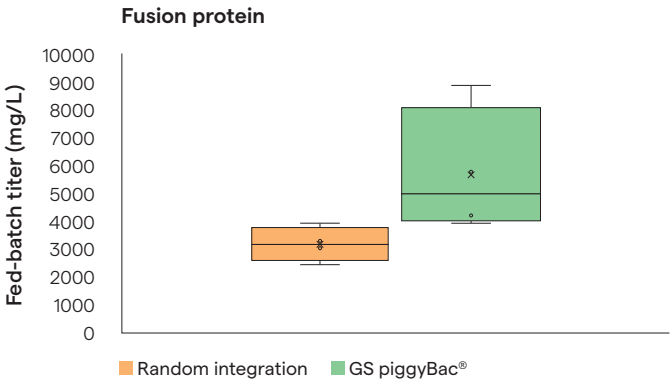
GS piggyBac® transposon technology

The GS® toolbox includes Lonza's proprietary GS piggyBac® transposon technology for efficient integration of your gene of interest into transcriptionally active genomic regions.

With the GS piggyBac® technology, you can benefit from:

- **Faster cell line development**
  GS piggyBac® technology can boost the chances of selecting a high producing clone, helping you get it right first time and minimising the risk of re-work
- **Commercially viable manufacturing processes**
  GS piggyBac® technology can increase the expression titer of a range of molecular formats, including more difficult-to-express proteins, compared to random integration approaches
- **Confidence in expressing diverse protein formats**
  GS piggyBac® technology can accommodate large DNA cargo (>200kb) making it amenable to the expression of a diverse range of biotherapeutic formats such as mAbs, bispecifics, fusion proteins, recombinant proteins and more





Proven, scalable and stable GS Xceed® and GS Effex® cell lines

Lonza's GS Xceed® CHOK1SV GS-KO® cell line delivers high titers (up to 9 g/L) across a range of biotherapeutic formats, has proven scalability and long-term expression stability for compatibility with commercial scale manufacturing.

The GS Effex® FUT8 knockout cell line is derived from GS Xceed® and retains all of the essential bioproduction characteristics — titer, scalability and stability — whilst driving the production of afucosylated mAbs with enhanced effector function via antibody-dependent cellular cytotoxicity for oncology applications.

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Relentlessly innovating

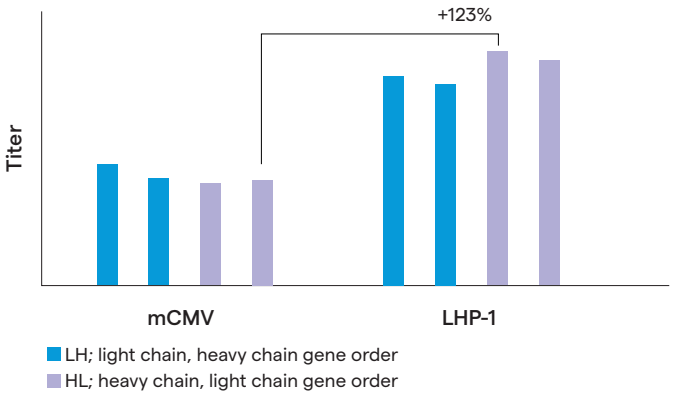
As the biotherapeutic landscape continues to evolve and more complex formats increase in prevalence, we are continually innovating and developing advanced technologies for the optimal expression and manufacturing of these next-generation biological therapeutics. We recently launched the novel LHP-1 synthetic gene promoter, available as part of the GSquad® Pro vector system.

The GSquad® Pro vector system can help to:

- **Support more efficient biomanufacturing**
  Higher titers of up to 120+%*+ for a range of molecules such as monoclonal antibodies, bispecific antibodies and fusion proteins
- **Enable faster material generation for tox studies or progression to cell line development**
  Faster post-transfection pool recovery rates*+
- **De-risk the development journey to commercial bioproduction**
  Higher titers without detriment to product quality attributes*
- **Avoid the risk of increased timelines and workload in cell line development**
  Excellent clonal long-term expression stability*

*Lonza internal data +Relative to mCMV promoter

The GSquad® Pro vector system, including the new LHP-1 promoter, is fully compatible with all components of Lonza's GS® toolbox and helps to de-risk your development path from discovery to commercial.



Learn more about the GSquad® Pro vector system, scan or click the QR code.

Accessing the GS® toolbox

Leverage our advanced expression technologies directly in your lab through the Lonza in Your Lab® licensing offering, or outsource to us at any stage of therapeutic protein development – from early development, through cell line construction, clinical supply and commercial manufacturing. Our in-house services use the same expression platforms giving you the flexibility to opt in to these at any stage.

Contact us today to find out more: **licensing@lonza.com**
Visit: **Expression Technologies | Lonza**

Contact us

To learn more, visit **www.lonza.com/integrated-biologics/expression-technologies**

To speak to an expert, contact us at **licensing@lonza.com**

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