

Your Reliable and Agile Partner for Top Results

With over 25 years of experience in animal cell culture, combined with innovative scientific excellence and a strong intellectual property base, we cover the drug development value chain up to clinical phase III.

Reliable Services

- ▶ Cell line engineering
- ▶ Process development
- ▶ GMP manufacturing

Innovative Technologies

- ▶ GlymaxX®
- ▶ Human Artificial Lymph Node
- ▶ Viral vector technologies

Our additional new building houses 1000 L single-use bioreactor capacity to keep up with the ever-increasing demand from our clients. A second 1000 L single-use bioreactor is coming soon.

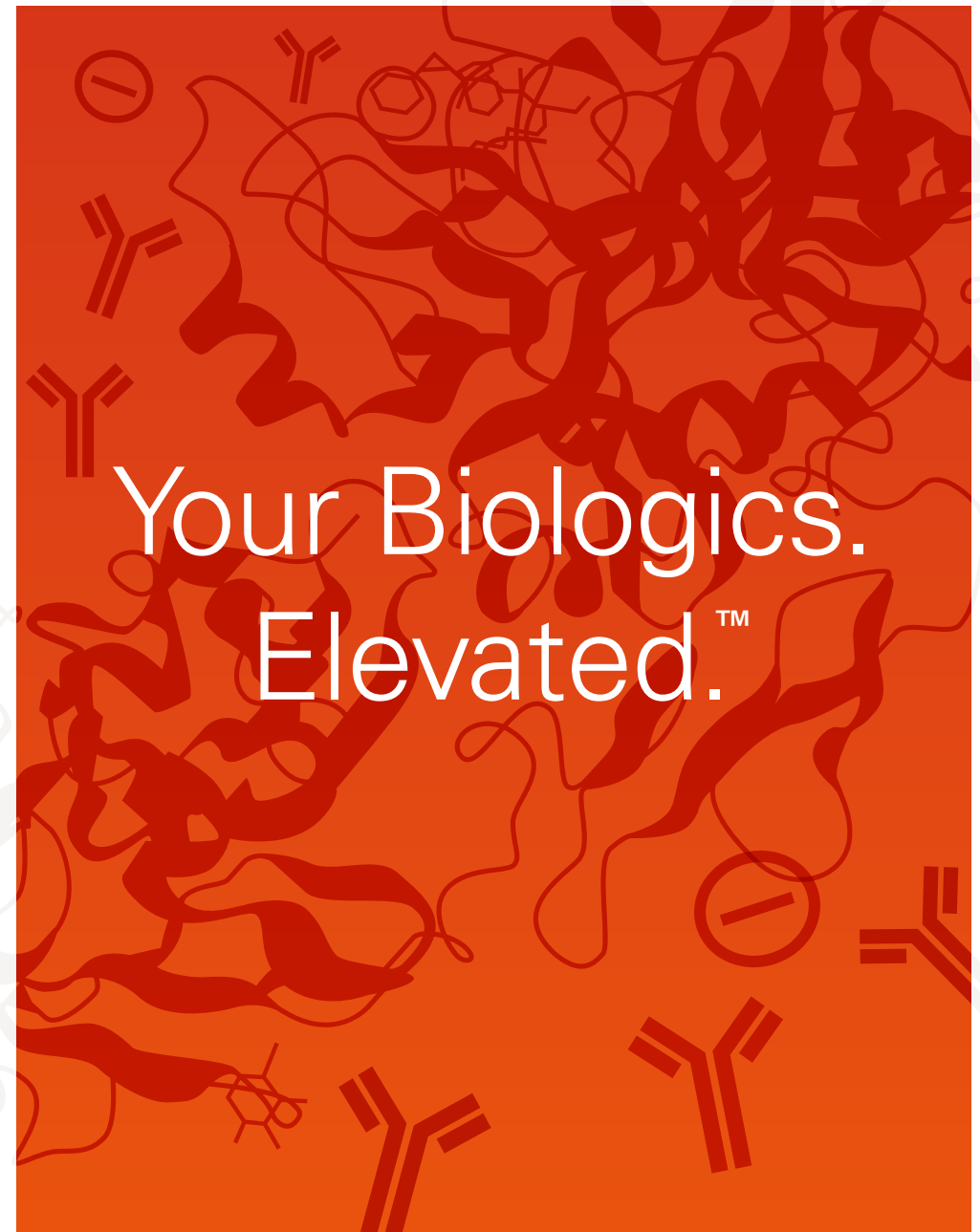
What is Your Objective?

ProBioGen I (Headquarter)
Herbert-Bayer-Straße 8
13086 Berlin, Germany

ProBioGen II
Goethestraße 54
13086 Berlin, Germany

Phone: +49 (0) 30 3229 35 100
Fax: +49 (0) 30 3229 35 400
Email: cmo@probiogen.de

www.probiogen.de



We Take Your Biopharmaceutical Drug Candidate to the Top – Reliably and Rapidly.

Whether you want to produce an antibody, a recombinant protein or a therapeutic enzyme – ProBioGen is your trusted and highly experienced partner for development and manufacturing. Starting with the CHO.RiGHT™ expression system and own host cell lines, our process is tailored to your individual requirements all the way to industrial production.

Expect best-in-class efficiency and competitive timelines combined with excellent customer service. We commit to top results and transparency at every stage.

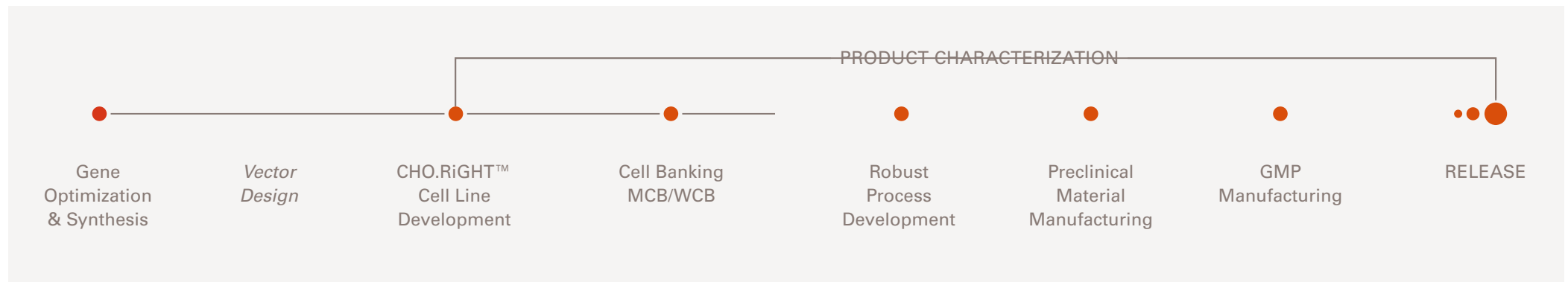
- ▶ GMP production cell lines
- ▶ Process development
- ▶ Non-GMP & GMP manufacturing
- ▶ Biosimilars & Biobetters
- ▶ Analytics/Bioassays

We Can Elevate Your Product to the Highest Yield, Potency, Quality, and Safety Levels.

Enhancing the performance of antibodies by stripping them of fucose, testing the recombinant protein's immunogenicity and function in-vitro, or providing modern viral vector technologies for your specific needs – our innovative technologies make those wishes your reality.

Industrially proven, licensable technologies, and straight forward business models

- ▶ ADCC enhancement
- ▶ Novel transposase
- ▶ Genetic glyco-engineering
- ▶ Human immunogenicity/-immunofunction testing
- ▶ Chemically-defined media platform
- ▶ Viral vector technologies
- ▶ Designer Cell Lines



CHO.RiGHT™ — GMP Production Cell Lines

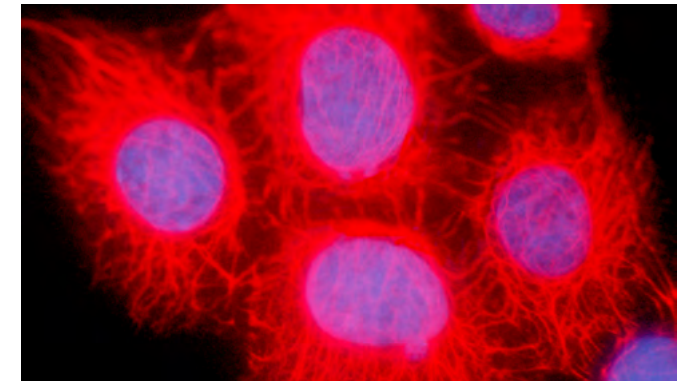
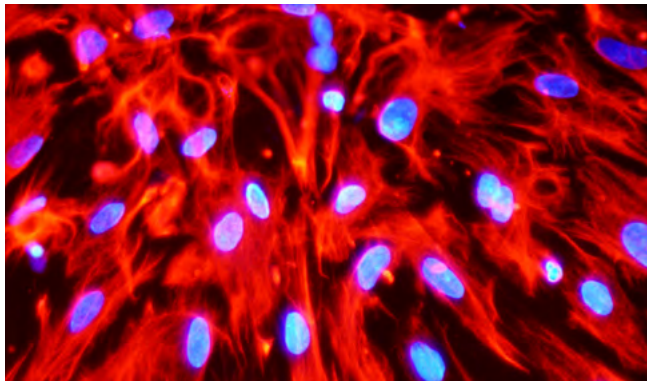
Choose your optimal cell line from a portfolio of host cell lines. High-yielding, fast, stable. Challenging proteins of every shade welcome — we've successfully dealt with them for over a decade.

- ▶ CHO.RiGHT™ expression system
- ▶ Expression vectors optimized in each element
- ▶ DG44 and K1 tuned starter cells
- ▶ Proprietary media platform/multiple suppliers
- ▶ Exceptional clone stability
- ▶ Reliably high productivity
- ▶ Clones selected for manufacturability and product quality
- ▶ Reports to support Investigational New Drug (IND) filing

Process Development

Take your product to the next level with our cost-effective process. Scalable, reliable, high titers.

- ▶ Robust and economic platform processes
- ▶ Classic and intensified processes
- ▶ Modular services and open source concept
- ▶ Cost-effective commercially available materials
- ▶ Disposable equipment to avoid cross-contamination



Non-GMP & GMP Manufacturing

Experience is key to ensure your satisfaction. We have 25 years of that under our belt. Expect nothing less than quality, consistency, and compliance throughout.

- ▶ Up to 1000 L Tox manufacturing
- ▶ Up to 1000 L GMP manufacturing
- ▶ Disposable, stirred tank bioreactors
- ▶ Platform production processes for mAbs

Analytcs/Bioassays

Don't take any risks, we don't either. Our physico-chemical analyses and cell-based activity assays from start to validation make sure we don't waste time or money. Instead, we produce integrity, purity, potency.

- ▶ Capabilities for developing and validating complex bioassays

Quality Management

Superior quality is based on the synergetic improvement of each individual process step.

- ▶ Standard DIN EN ISO 9001:2008
- ▶ Manufacturing authorization for GMP manufacturing and batch release

GlymaxX®: Glyco-Engineering to Boost the ADCC Activity of Antibodies

Ramping up antibody-NK cell binding by altering the fucose content.

- ▶ Afucosylated antibodies: modify fucose synthesis in your platform cell line or during cell line development
- ▶ Potency adjustable
- ▶ Clinically proven
- ▶ Simple and efficient
- ▶ Works on all cell lines; cell properties unchanged
- ▶ No culture additives needed

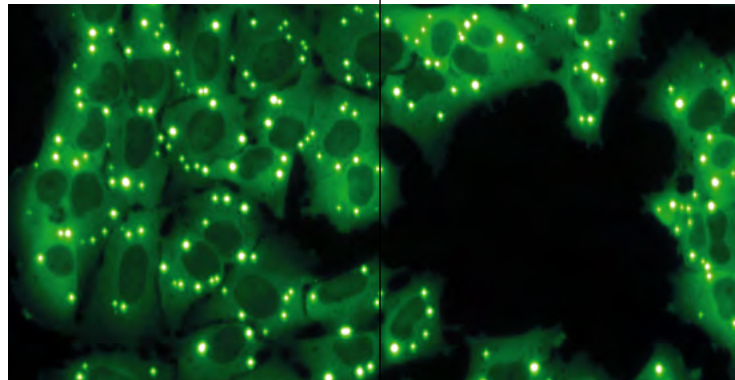
Directed Luck: Novel Transposase with Epigenetic Targeting

- ▶ Multiple independent genome integrations
- ▶ Only in chromatin that is active in the chosen cell
- ▶ No prokaryotic elements
- ▶ Confers speed, stability, robustness, and performance

Hu-ALN Immunogenicity/-function Testing

Test your drug, vaccine, or cosmetic on our fully human 3D micro-organoid model (hu-ALN) to predict effects and potentially save huge amounts of time and money.

- ▶ Risk-evaluation
- ▶ Dose-finding
- ▶ Vaccine potency, benefit of adjuvants



AGE1 and Beyond: Helper, Packaging, and Host Cell Lines

Gene therapy vectors, oncolytic viruses, attenuated and vectored vaccines prevent and cure diseases. They are key to cost-effective and potent medical interventions but depend on cell lines for essential steps from generation and testing to production.

Viral Vector Technologies – Your Custom Viral Vector at Top Efficiency

We reduce the complexity of virus-based medicines with a modular approach. Welcome to our:

- ▶ Continuous AGE1.CR duck cell line to replace primary chicken embryo fibroblasts
- ▶ Powder-formulated chemically-defined media for processes at industrial scale
- ▶ Designer and helper cell lines with reduced antiviral responses equipped for production of replication-deficient vectors
- ▶ The novel strain MVA-CR19 of modified vaccinia virus Ankara as a vehicle to induce a comprehensive immune response
- ▶ Spectrum of potential host cell lines for different vectors and vaccine strains

Vector and Vaccine Development

Our scientists are deeply experienced with many aspects of gene therapy and vaccine development. We have developed and modernized vaccine production for several clinical and veterinary indications. The optimized ProBioGen technology was transferred successfully to clients and is an enabling component in approved and investigational human and veterinary vaccine programs.

