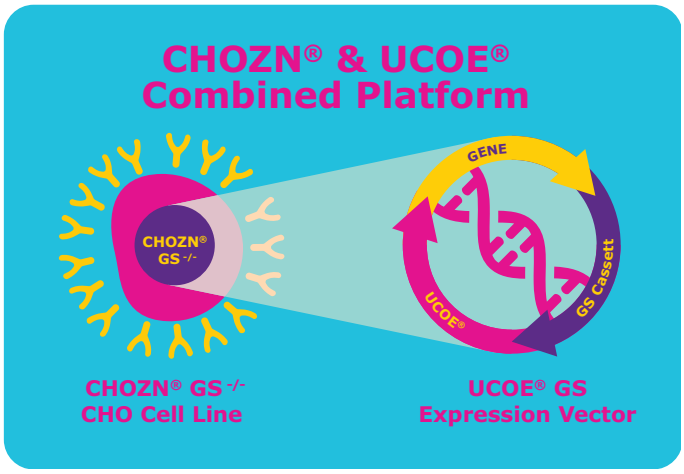
SAFC®

Pharma & Biopharma Raw Material Solutions

MilliporeSigma

# CHOZN® & UCOE® Combined Platform

## Accelerate Biopharmaceutical Development with an Integrated Upstream Solution




### Isolate more high-producing clones with fewer resources

The CHOZN® & UCOE® Combined Platform's streamlined processes offer numerous efficiencies for cell line development. While maintaining all the benefits of the CHOZN® GS expression system, through the CHOZN® & UCOE® Combined Platform you can also:

- Accelerate your cell line development by increased efficiency of isolating high producing clones. Eight-fold more clone candidate pools and twice the number of clones expressing more than 3 g/L were obtained with the combined platform.
- Increase cell line development success with hard-to-produce molecules
- Achieve high and stable titers to expedite your cGMP manufacturing with fewer resources

For nearly a decade, the CHOZN® GS platform has been used to develop high expressing, stable biomanufacturing clones. Consisting of a ZFN-modified CHO-K1 line, paired cell culture media and feeds, an expression vector, documentation and protocols, the platform is optimized to consistently isolate the high-expressing clones within a transfected pool. However, cell line development can be a lengthy and resource-intensive task because these high-expressing clones are relatively infrequent within the pool.

The UCOE® technology offers a path to increase the frequency of these high-expressing clones, thereby reducing the time and resources needed for cell line development.

The UCOE® (Ubiquitous Chromatin Opening Elements) technology uses naturally-occurring sequences capable of creating and maintaining open chromatin to enable high, stable transgene expression, regardless of the integration site. When included in a plasmid alongside the transgene of interest, these UCOE® elements greatly increase the number of high expressing clones that can be isolated within a single cell line development process.

To demonstrate the ability of the CHOZN® & UCOE® Combined Platform to increase the number of high-expressing clones, two concurrent IgG1 cell line development procedures were initiated. CHOZN® GS$^{-/-}$ cells were transfected with either the standard CHOZN® GS expression vector containing gene cassettes

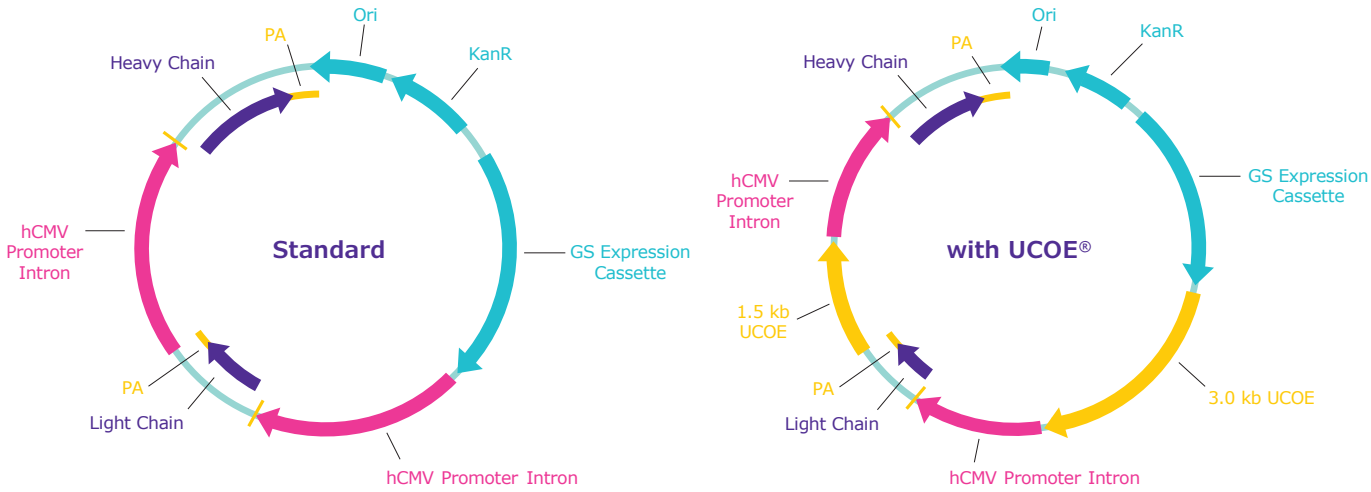



**Figure 1.** Standard CHOZN® expression vector (left) and CHOZN® expression vector with the addition of UCOE® sequences (right).

for an IgG1 heavy and light chain (Control), or the CHOZN® expression vector with the addition of UCOE® sequences (UCOE), pictured in **Figure 1**. The CHOZN® GS$^{-/-}$ protocols were followed. At each screening step, the UCOE conditions yielded multi-fold more high producing pools and clones (**Figure 2**). This increased efficiency in generating high producing pools and clones in the CHOZN® & UCOE® Combined Platform can be leveraged to:

- Reduce screening and scale-up efforts over the course of cell line development without compromising productivity goals
- Help ensure cell line development success with hard-to-produce molecules
- Identify more pools and clones that match both titer and protein quality criteria

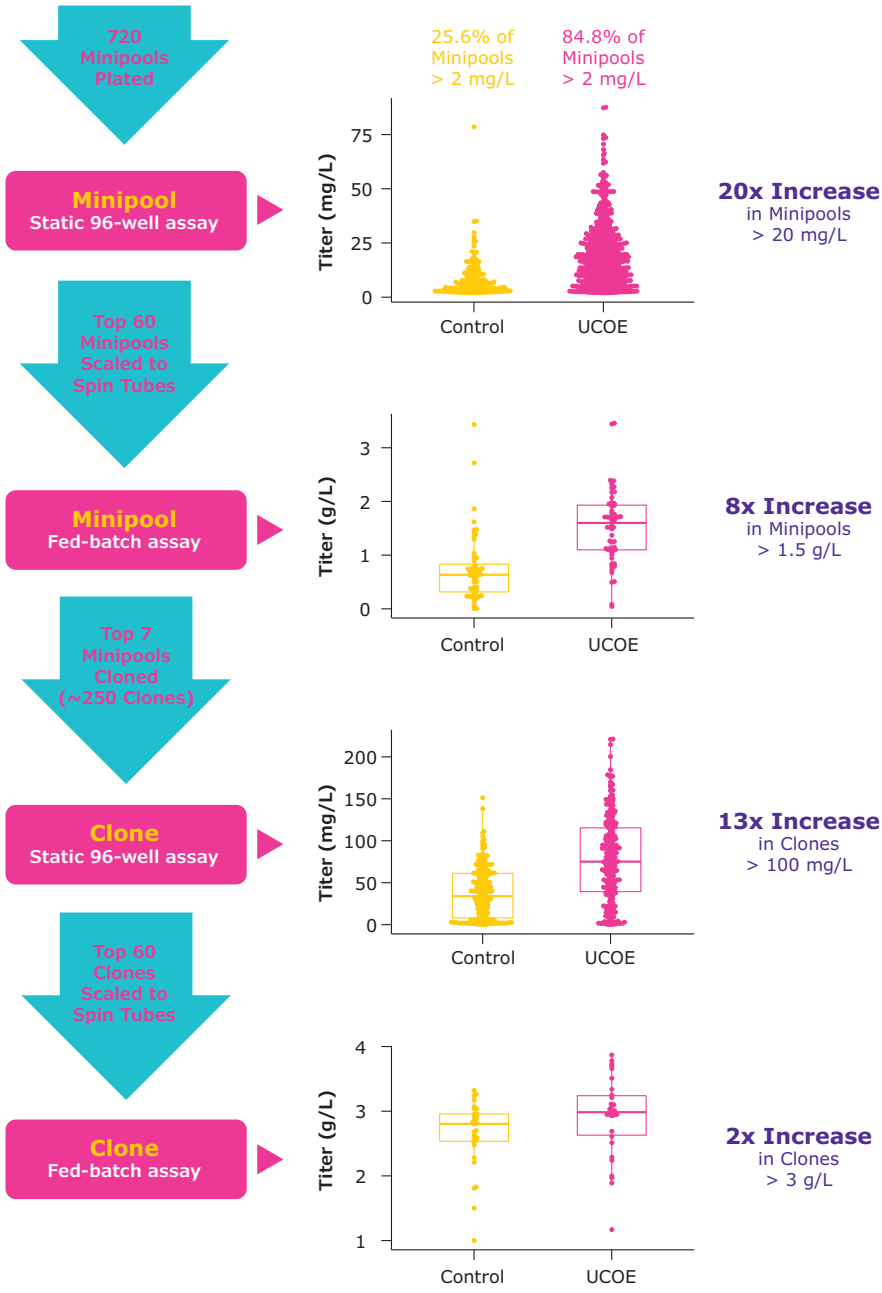



**Figure 2.**
At each screening step, the UCOE conditions yielded multi-fold more high producing pools and clones.

## CHOZN® GS$^{-/-}$ Cell line

- ECACC CHO K1 origin, adapted to suspension growth in chemically defined, animal component-free media
- GS$^{-/-}$ phenotype knock out by targeted mutagenesis using the non-virus ZFN gene editing technology
- Enables rapid cell line development by metabolic selection without the addition of MSX (GS inhibitor)
- cGMP-banked and fully traceable cell lines
- Paired, batch-to-batch consistent and chemically defined cell culture media and feeds using highest grade of critical raw materials

## UCOE® Technology

- Highly-characterized Ubiquitous Chromatin Opening Elements create and maintain open chromatin
- Offers major improvements in gene expression in stably transfected mammalian cells

## CHOZN® & UCOE® Combined Platform

- Clear IP path for the complete platform
- Complete documentation and cell line history
- Comprehensive user protocols guide customers from transfection through small scale bioreactors
- Optimized UCOE® GS vector for expression of antibodies, Fc-fusion or recombinant proteins
- Simple and accessible combined platform licensing structure
- Technical support and consultation

To place an order or receive technical assistance in the U.S. and Canada, call toll-free 1-800-645-5476
For other countries across Europe and the world, please visit: **EMDMillipore.com/offices**
For Technical Service, please visit: **EMDMillipore.com/techservice**

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