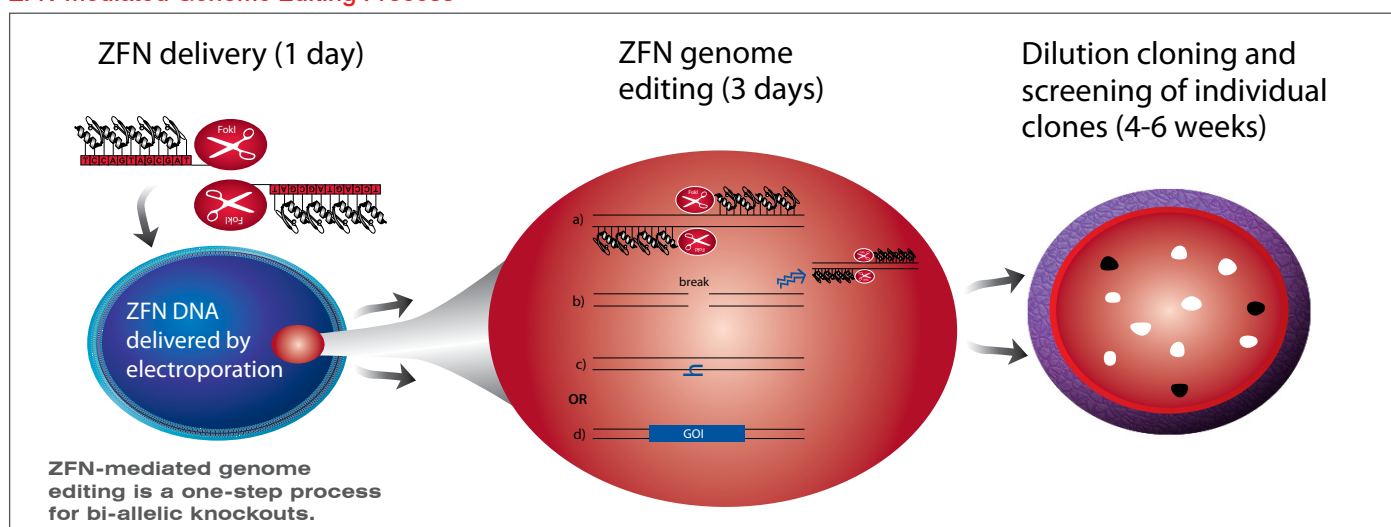


Zinc Finger Nucleases for Precise Editing of the CHO Cell Genome

- Bi-allelic knockouts are routine; multiple alleles are modified in a single step
- Genomic modifications are precise, permanent and heritable
- Six weeks from DNA to phenotype of bi-allelic knockouts
- Technical support from team of experts

ZFN-mediated Genome Editing Process



Applications to CHO Cell Engineering

- Improve cell culture performance: titer, growth, longevity
- Enhance product quality and efficacy by modification of glycosylation
- Remove interfering host cell proteins: endogenous CHO cell molecules that co-purify or otherwise interfere with product yield
- Introduce metabolic selection markers: bi-allelic knockouts of GS or DHFR

ZFN Catalog Products

Product Name	Cat. No.
CompoZr® Knockout ZFN Kit-CHO GS glutamine synthetase	ZFNGS-1KT*
CompoZr® Knockout ZFN Kit-CHO DHFR dihydrofolate reductase	ZFNDHFR-50UG*

* All products are delivered as plasmid DNA

Cell Design Studio (CDS)

Service	Lead Time	Cost	Cat. No.
Custom ZFN reagents	8-10 weeks	Upon Request	SAFCZFN-1KT
CDS*	16-18 weeks*	Varies*	N/A

* Cell Design Studio can perform ZFN knockout in customer cell line or SAFC cell line in our labs. Lead times and cost vary depending on project complexity.

† Investigational new drug (application)

CHOZN® ZFN-modified CHO Cell Lines

SAFC has created a series of zinc finger nuclease (ZFN) modified CHO cell lines with characteristics that are desirable in a platform cell line. These cell lines have the ability to reliably produce clones that exhibit favorable characteristics, including:

- High growth and productivity – both Qp and volumetric
- Suspension growth in chemically-defined media
- Responsiveness to feeds
- Scalability in bioreactors
- Complete traceability and safety testing

CHOZN ZFN-modified CHO Cell Lines

Name	Cat. No.	Format
CHOZN DHFR ^{-/-} CHO Cell Line	CHODHFR-1VL	1 mL frozen vial containing >7.5e6 cells/mL
CHOZN GS ^{-/-} CHO Cell Line	CHOGS-1VL	1 mL frozen vial containing >7.5e6 cells/mL

Features**CHOZN GS**

- First ever commercially available GS knockout CHO cell line
- CHOZN GS line developed by targeted mutagenesis with ZFNs in a suspension adapted ECACC CHO-K1 parental
- Strong metabolic selection, which means fewer clones need to be screened = decreased cell line development resources
- No MSX required for selection/amplification
- cGMP manufactured/banked
- No IP or associated royalties

CHOZN DHFR

- CHOZN DHFR line developed by targeted mutagenesis with ZFNs in a suspension adapted ECACC CHO-K1 parental
- DHFR selection is industry-accepted method
- No IP or associated royalties

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