

Product Information

CHOZN® ZFN-Modified DHFR^{-/-} CHO Cell Line

CATALOG NO. CHODHFR

Product Information

CHOZN DHFR^{-/-} cell line was created using Sigma's proprietary CompoZr® Zinc Finger Nucleases (ZFN) technology. ZFNs are a class of engineered DNA-binding proteins, which facilitate targeted genome editing by binding to a user-specified locus and causing a double-strand break (DSB). The cell then employs endogenous DNA repair processes, either non-homologous end joining (NHEJ) or homology-directed repair (HDR), to heal this targeted DSB. These repair processes can be channeled to generate precisely targeted genomic edits resulting in an organism or cell lines with specific gene disruptions (knockouts), integrations, or modifications.

The dihydrofolate reductase (DHFR) protein catalyzes the reduction of 5,6-dihydrofolate to 5,6,7,8-tetrahydrofolate, an essential step in purine metabolism. Cells lacking a functional copy of the DHFR gene must be grown in culture medium supplemented with the purine precursors hypoxanthine and thymidine (HT). This metabolic selection process can be used to select for cells that have been transfected with a gene(s) of interest for recombinant protein expression along with an exogenous copy of the DHFR gene. Methotrexate (MTX) strengthens the selection process by inhibiting DHFR activity, thereby pushing the cells to express more DHFR and consequently more recombinant protein, presumably through gene amplification. Currently, the biopharmaceutical industry uses DUXB11 and DG44 host cells for DHFR selection of recombinant cell lines. The DHFR deficiencies in these cell lines were created by random mutagenesis which likely resulted in additional genetic modifications in the cell lines. DUXB11 cells only harbor a partial knock-out of the DHFR gene, and, therefore, DHFR selection strategies are less effective in this cell line. DG44 cells tend to have some unfavorable characteristics as well. They tend to be clumpy in culture and difficult to adapt to serum-free suspension cell culture conditions. Using the ZFN technology, SAFC has engineered a novel CHO K1 DHFR^{-/-} cell line. This CHOZN DHFR null cell line is adapted to chemically-defined, suspension growth in EX-CELL® CD CHO Fusion media (SAFC Cat. No. 14365C) and maintains many of the robust characteristics of CHO K1.

Kit Components

Component	Cat. No.	Quantity
CHOZN DHFR ^{-/-} cell line	CHODHFR-1VL	1 Vial of cells with >7.5e6 cells/mL

Features and Benefits

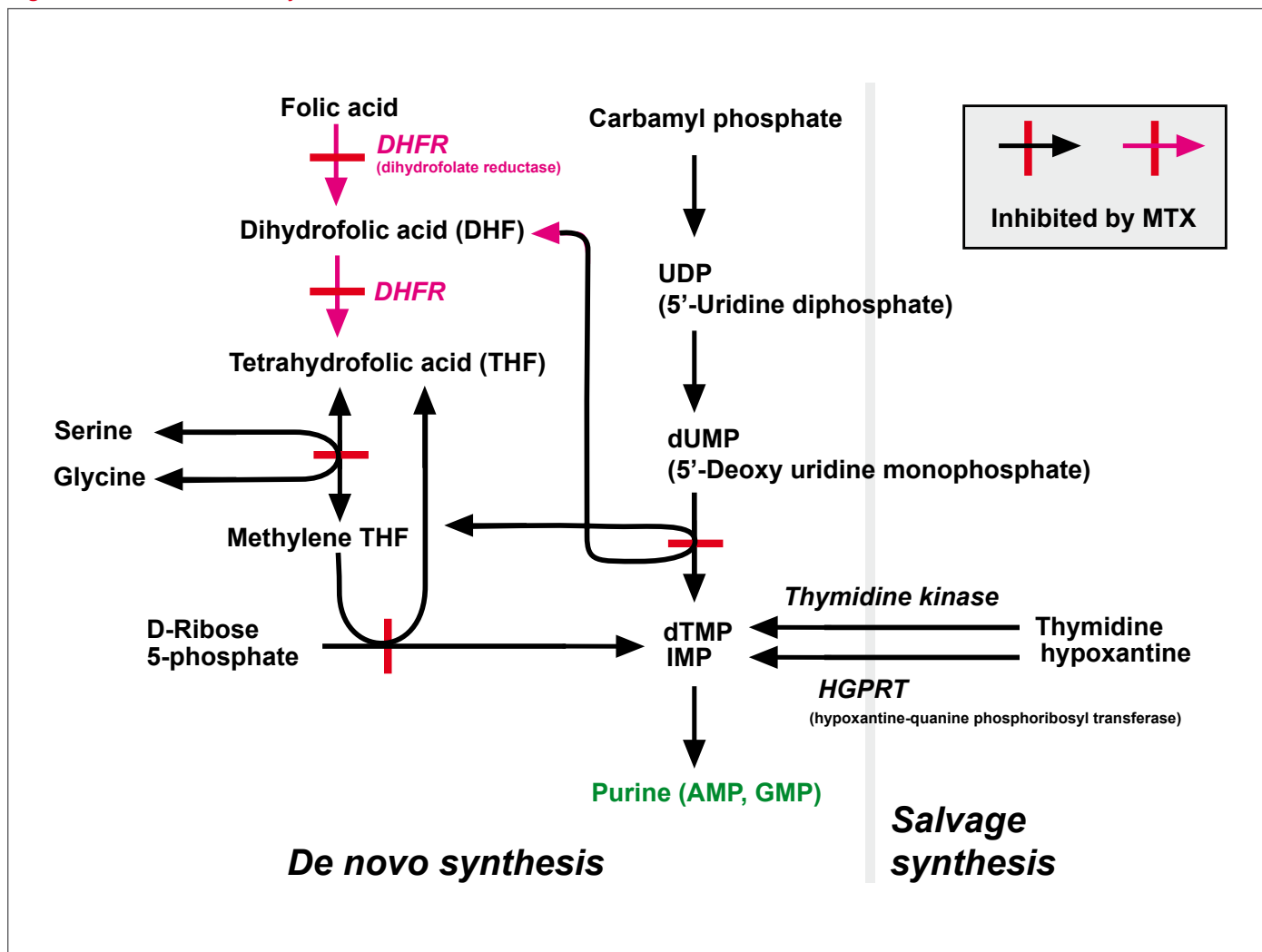
- DHFR deficient CHO K1
 - Enables rapid development of recombinant cell lines by metabolic selection
 - Cell lines are further susceptible to gene amplification
 - No IP, or associated royalties
 - DHFR selection is industry-accepted method
- DHFR^{-/-} CHO K1 cell line developed by targeted mutagenesis using the ZFN technology
 - Significant decrease in the possibility for off-target mutations that result from traditional mutagenesis strategies
- Cell line adapted to suspension growth in chemically defined, animal component free media.
 - Regulatory friendly
 - Easy to scale up
- Cells originated from ECACC CHO K1
 - Cells maintain many CHO K1 robust growth characteristics (such as short doubling time and reduced clumping in culture when compared with DG44)
- Complete traceability/rigorous testing procedures
 - Regulatory-friendly
- Comprehensive protocols detailing recommended selection strategies
- Trouble shooting with readily accessible technical experts
 - Easy to use

The CHOZN DHFR^{-/-} cell line is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage and Stability

Store the cells in liquid nitrogen immediately upon arrival.

Figure 1. The DHFR Pathway



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