

CET Contract Manufacturing and Contract Research Services in Bioprocessing

Our Company

Cellular Engineering Technologies Inc. (CET) is a biotechnology company that provides contract manufacturing and contract research services in human stem cells and bioprocessing in mammalian and human cultured cell systems. CET's cell products have been sold around the globe and used by academia, industry, non-profits and government laboratories for the past 13 years and have been cited in many peer-review publications. CET has the world's largest repository of commercial human somatic stem cells. CET also has developed the first virus-free and oncogene-free induced pluripotent stem cell (iPSC), which has broad applications in drug development, bioprocessing and regenerative medicine.



Contract Manufacturing and Research Services in Protein Bioprocessing Using Mammalian and Human Cells

CET has the expertise to assist scientists in producing custom human or animal-specific proteins. CET offers years of expertise in mammalian and human cell manufacturing, molecular cloning and protein purification. CET can provide complete vertical integration of the entire workflow in the bioprocessing operation from *de novo* synthetic gene design and synthesis, custom vector development and stable cell line creation with CHO cells and non-controversial human cells. These capabilities provide the end user a native protein with the desired post-translational modifications.



CET Background Capabilities in Contractual Bioprocessing Services

Cellular Engineering Technologies Inc. (CET) is a biotechnology company that provides protein and peptide production and bioprocessing services using mammalian and human cell cultured systems. The usage of a mammalian system assures a better glycosylation profile as compared to bacterial, yeast or baculovirus systems. This can have a significant impact on protein bioactivity and half-life clearance. CET can rapidly produce protein using highly efficient gene delivery in suspension in CET's proprietary CHO-K1 system. Alternatively, CET can also screen and create a more permanent CHO cell line that expresses a protein of interest.

CET's Cloning and Protein Production Services Include the Following:

Vector Cloning:

CET can synthesize any mammalian expression construct that you have in mind. Please see our options below:

- Investigator supplied DNA or Genbank accession number specific for mRNA or cDNA.
- Full suite of synthetic biology services including synthesis of entire insert if the cDNA is unavailable.
- Species specific codon optimization for robust protein expression.
- Full in-silico cloning to provide investigator with project outline, timeline and workflow.
- Ligation and restriction enzyme independent seamless cloning of open reading frame.
- Sanger di-deoxy sequencing of cloned insert for validation.
- Choice of mammalian promoters including CMV, EF1A and CAG.
- Choice of mammalian cytosolic, nuclear, transmembrane or secreted protein expression.
- Choice of popular IMAC and affinity isolation tags (either N-Terminal or C-Terminal) including c-Myc, FLAG, GST and HIS tags.
- Choice of fusion proteins including GFP, RFP and Fc fragment (either N-Terminal or C-Terminal).
- Choice of protease motifs to remove tag, including TEV, EKT, SUMO and WELQ proteases. Custom protease sequences are welcome.
- Provision of transfection quality DNA to investigator ready for transfection and expression in your own cell line.

Vector Expression Systems in CHO cells or human cell line:

CET can either express your provided construct or one that we create for you in mammalian cells. Please see our options below:

- Expression of construct in adherent or suspension CHO-K1 cells.
- Expression of construct in human cell lines.
- Creation of stable mammalian or human cell line using puromycin screening to express protein of interest.
- Provision of crude cell lysate containing expressed protein.
- Provision of conditioned media containing expressed protein (if secreted).

Protein Validation:

CET can validate the expression of your protein, post-transfection in mammalian cells. Please see our options below:

- Western blot of protein expression in mammalian cells. Investigator chooses system and provides primary antibody.
- Fluorescence imaging of intracellular, transmembrane or nuclear protein expression, if fused with GFP/RFP or similar fluorophore.

Advantages of Outsourcing Contractual Research With CET:

- Cost of contractual research is competitive because Iowa has low cost of doing business with a highly educated technical work force.
- CET uses only US supply chains which provides better quality control management and better communication than overseas competitors.
- Ease of communication with US customers with actual technical support team compared to overseas companies with language barriers and time zone differences.
- Competitive project turnaround time.

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