

Streamline the path from discovery to cure

Cell therapy solutions for every step

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ThermoFisher
SCIENTIFIC

Your work holds the potential to deliver life-changing treatments

Our mission is to help you succeed

As the world leader in serving science, Thermo Fisher Scientific provides the quality materials, services, and support you need to translate your cell therapy from discovery to clinical research and commercial manufacturing.

We're working alongside the scientific community to accelerate the pace of cell and gene therapy development. Because, like you, we believe in the promise of those therapies to fundamentally transform our approach to health care. And we won't stop until that's a reality.

thermo
scientific

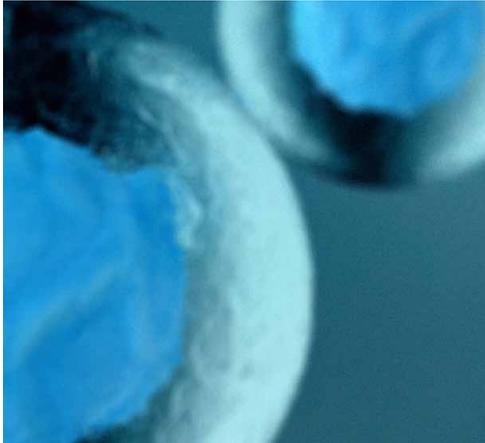
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biosystems

invitrogen

gibco

patheon

Contents



Our commitment to cell therapy—the beliefs that drive every decision we make 5

Development stages—solutions for research to manufacturing 6

Cell Therapy Systems (CTS) products—designed for cell and gene therapy 8

GMP quality—our number one priority 9

Workflow solutions—complete capabilities from research to clinic and beyond 10

- Immunotherapy and T cell therapy 10
- Pluripotent stem cell therapy 12
- Mesenchymal stem cell therapy 14
- Hematopoietic stem cell therapy 16
- Cell therapy selection guide 18

Cell therapy characterization—tools for in-process and lot-release testing 20

Discovery and translation—broad capabilities to support your journey 23

Bioprocessing—support at every step of the way 25

Clinical trial support and cold-chain logistics—experience, resources, and expertise to guide you on your path toward commercialization 26

Ordering information 30





Our commitment to cell therapy

The beliefs that drive every decision we make

Quality comes first. The proof is in our performance. We have almost 60 years of experience with Gibco™ media, manufacturing that is compliant with current good manufacturing practices (cGMP), a robust quality management system, and a track record of supplying the top 50 biopharma companies worldwide with solutions that help them succeed.

Scale and security of supply are critical. Our products are backed by our professional regulatory support, a robust supply chain, and global manufacturing. Cloud-connected equipment, along with a range of informatics and laboratory information management systems (LIMS), offers peace of mind, workflow efficiency, and facilitates regulatory reporting. This translates to consistent supply and scalable solutions that help clear the path to commercialization.

Continued advancement requires continued investment. Every year, we make significant investments in operational expansion to grow our cell therapy solutions. And we'll continue to invest so we can deliver leading innovation, support, and manufacturing capabilities to help accelerate your work.

A good partner goes the distance. We support our customers from discovery through to commercialization with a full suite of products and services ranging from Gibco™ Cell Therapy Systems (CTS™) media and reagents, scale-up and scale-out bioprocessing solutions, a wide array of laboratory equipment, liquid handling equipment and consumables, state-of-the-art analytics, viral vector development and manufacturing services, clinical supplies, and global cold-chain logistics and distribution services.

Development stages

Solutions for research to manufacturing

Regardless of where you are in your cell therapy development, we have solutions to help you achieve your cell therapy goals—all the way through to commercialization.

Discover



Discover

Cell therapy discovery can be a lengthy process, but it holds extraordinary promise. We have an extensive portfolio of cell culture, cell engineering, and characterization solutions to aid in your discovery process.

- **Cell culture reagents**—product-level xeno-free and animal origin-free media and reagents to support cost-effective research, with complementary Gibco™ CTS™ products to help you maximize the potential of your research by supporting a smooth transition to the clinic.
- **Cell culture equipment**—Thermo Scientific™ CO₂ incubators, biosafety cabinets, and filtration devices are designed to help avoid contamination. We also offer a broad range of centrifuges, culture vessels (including single-use hardware), and consumables to maximize workflow efficiency.
- **Cell engineering**—solutions including gene editing and electroporation tools, viral vector production and purification products, and viral vector CDMO services.
- **Broad characterization portfolio**—equipment, tools, and reagents for cell counting, whole cell analysis, protein analysis, and genetic analysis, along with safety testing including screening for endotoxin and mycoplasmas.

Learn more at [thermofisher.com/celltherapy](https://www.thermofisher.com/celltherapy)



Develop

Advancing your cell therapy product from research to clinical applications requires careful material selection and thoughtful process development. Our solutions can help you translate your therapy to the clinic.

- **CTS media and reagents**—extensive selection of GMP-manufactured media and reagents designed for cell therapy applications, including serum-free media (SFM), serum replacement, wash buffers, and cryopreservation solutions.
- **CTS series laboratory equipment**—explore integrated solutions that support your GMP and clean room needs for cell and gene therapy, from CO₂ incubators and centrifuges to cold storage, biological safety cabinets, and beyond. Our product innovations are supported by high-quality materials, factory acceptance certification, and on-site compliance services.
- **Custom media and process development services**—Gibco media formulations available in the packaging and formats that meet your unique needs.



Manufacture

As you move toward commercialization, our solutions can scale with you to meet the clinical need.

- **Scale-up and scale-out solutions**—proven, robust, and scalable solutions that span the entire cell therapy development process, from cGMP-manufactured custom media to bioreactors, cultureware, and cell culture bags, for a complete cell expansion solution.
- **Analytical solutions**—state-of-the-art cellular analysis tools for your in-process and lot-release development testing needs, including microbial detection and identification, impurity testing, and cellular analysis tools.
- **Global cold-chain logistics services**—expertise and a global infrastructure to seamlessly collect patient cells, safely transport them to manufacture, then back to the patient's bedside. Get comprehensive end-to-end supply chain management and benefit from cGMP-compliant kit production, global biobanking capabilities, and cryogenic distribution for total peace of mind.
- **Clinical trial support**—experience, resources, and global expertise and infrastructure from Patheon Viral Vector Services, a leading provider to the cell and gene therapy community.

Cell Therapy Systems (CTS) products

Designed for cell and gene therapy

CTS reagents provide you with GMP-manufactured products designed for cell and gene therapy, so you can transition your therapy to the clinic with confidence.

cGMP manufacturing

- Manufactured in conformity with GMP for medical devices, 21 CFR Part 820, following USP<1043> and Ph Eur 5.2.12
- Manufacturing sites that are FDA-registered and ISO 13485–certified and regularly audited

Testing and documentation

- Traceability documentation, including Drug Master Files (DMFs) and/or Regulatory Support Files (RSFs) and certificates of origin
- Product safety testing, including sterility, endotoxin, and mycoplasma on media and reagents

Proven use

- Used in FDA-approved and EMA-approved CAR T therapies [1,2] and the first FDA-approved therapeutic cancer vaccine [3]
- Used in over 200 clinical trials



GMP quality

Our number one priority

Providing quality for our customers drives everything we do. We take every measure to deliver the best possible experience, from the products we develop to the services we provide.

GMP facilities and manufacturing excellence

Over 30 years of experience with GMP manufacturing and ongoing facility-focused investments enable us to provide high-quality products and services to support cell therapy development. Our manufacturing sites are ISO 13485- and ISO 9001-certified, and FDA-registered. And our global footprint facilitates supply of the highest-quality products to all of our customers, regardless of location.

To support our customers' quality assurance efforts, we host more than 200 customer audits per year.

Quality manufacturing and adherence to regulatory requirements

Successful clinical translation of a cell therapy product hinges on early process- and product-selection decisions. High-quality products and proper documentation and support are essential for a streamlined transition from research to the clinic.

We offer a broad array of media and reagents to support your cell therapy development, including Gibco CTS products, that are specifically designed for use in cell and gene therapy applications. The methods and controls used for manufacturing conform with cGMP for medical devices, 21 CFR Part 820, and follow USP <1043> and Ph Eur 5.1.12.* We regularly audit our portfolio of CTS products to ensure compliance with current global regulatory guidance.

Our CTS series laboratory products, featuring CO₂ incubators, centrifuges, cold storage, and biological safety cabinets, are supported by high-quality materials, factory acceptance certification, and on-site compliance services.

Testing and regulatory documentation

Gibco CTS media and reagents undergo QC testing for sterility and presence of endotoxins, adventitious agents, and mycoplasmas. The high degree of qualification and traceability documentation, including FDA Drug Master Files, certificates of analysis, and certificates of origin, ease the burden on your quality systems by helping to support your regulatory submission and reduce risk throughout. This ultimately saves time and facilitates a seamless transition to the clinic.

Clinical and commercial use

In addition to providing high-quality Gibco CTS products with appropriate documentation and support, we have the honor of helping many of our customers advance their work to the clinic and through to commercialization, as evidenced by:

- The use of our products in FDA-approved cell therapies and in over 200 clinical trials
- Secured rights to enable your path to commercial use

Professional support

By collaborating with our clients, we are able to provide solutions that optimize quality, service, and cost while delivering results.

- Our knowledgeable regulatory support team will help you navigate regulatory processes from research through to commercialization
- Experienced cell therapy professionals leverage decades of cumulative translational and commercial experience to help answer your questions
- Regional technical support teams and highly specialized scientific teams are available to provide detailed product and protocol consultation, as well as customization services

* CTS products are manufactured to meet the ancillary material supplier responsibilities for cell, gene, and tissue-engineered products. Other aspects of USP <1043> are the responsibility of the end-user to assess. Thermo Fisher Scientific cannot fulfill USP <1043> in regard to application and therapy specific aspects (e.g., use in a finished therapeutic, assessment of removal from a finished therapeutic, and possibly biocompatibility, cytotoxicity, or adventitious agent testing).

Workflow solutions

Complete capabilities from research to the clinic and beyond

We have capabilities that span the immunotherapy and stem cell therapy workflows. Our products, services, and support can facilitate a seamless transition from research to commercialization, with a goal to reduce the time from your initial discovery to an approved therapy.

Gene-modified T cell therapy

Gibco™ CTS™ Dynabeads™ T cell expansion products—mimic *in vivo* T cell activation via antigen-presenting cells. This gentle and efficient technology provides a trusted technology platform from which the beads can be used to isolate T cells and provide both the primary and co-stimulatory signals required for activation and expansion [4–6].

- Can be used for the isolation, activation, and/or expansion of polyclonal T cells, antigen-specific T cells, gene-modified T cells, and other T cell subtypes [4,5]
- Isolated and activated T cells enable efficient gene transduction [6]
- Expanded T cells have a T central memory phenotype with *in vivo* persistence [7]
- Delivers 100- to 1,000-fold expansion in 9–14 days [8]

Gibco™ LV-MAX™ Lentiviral Production System—addresses challenges that exist in adherent and suspension methods for lentiviral vector production by providing a cost-effective and scalable platform to support your current lentiviral vector needs and future GMP large-volume demand.

- Complete system with high-density suspension cell line, medium, supplement, transfection reagent, and enhancer
- Serum-free, chemically defined system with research-grade and GMP-manufactured options
- Delivers $>1 \times 10^8$ transduction units/mL (original concentration LVV-GFP)

Gibco™ CTS™ Immune Cell Serum Replacement (SR)—a defined xeno-free formulation proven for clinical use and designed to support expansion of *in vitro* cultured human T cells when added as a supplement to a basal cell culture medium such as Gibco™ CTS™ OpTmizer™ T Cell Expansion SFM or Gibco™ CTS™ AIM V™ Medium.

- Minimizes the supply and safety risks associated with human serum
- Supports T cell phenotype (CD4, CD8, and CD62L), similar to human serum [9]
- Supports expansion, efficacy, and persistence of lentiviral gene-modified CAR T cells

Gibco™ CTS™ OpTmizer™ medium—a complete, product-level xeno-free medium formulation proven for clinical success and specifically developed for the growth and expansion of human T lymphocytes.

- Supports high-density T cell culture ($>3 \times 10^6$ CD3⁺ T cells/mL) in static culture, including CAR T cells
- Supports T cell activation using Dynabeads magnetic beads and stimulatory antibody-presenting cell protocols
- Supports phenotype, function, and viability (e.g., cytokine secretion profile) similar to T cells cultured with conventional medium supplemented with human AB serum

Learn more about CTS products for immunotherapy at thermofisher.com/ctsimmunotherapy and thermofisher.com/immunotherapy

For ordering information, go to page 30



Isolation and activation

Gibco isolation/activation

CTS Dynabeads CD3/CD28
 Dynabeads Human T-Expander CD3/CD28
 CTS Dynabeads Treg Xpander

Gibco magnet

CTS DynaMag Magnet



Engineering

Gibco gene editing

TrueCut Cas9 Protein (CTS-Prototype)

Invitrogen gene editing

CRISPR-Cas9 and designer TALEN products and services

TrueGuide Synthetic gRNA
 TrueCut Cas9 Protein v2

Invitrogen electroporation device

Neon Transfection System

Invitrogen transfection reagents

Lipofectamine 3000 Transfection Reagent

Lipofectamine 2000 CD Transfection Reagent

Lipofectamine MessengerMAX Transfection Reagent



Expansion

Gibco catalog and custom media

CTS OpTmizer T-Cell Expansion SFM
 CTS OpTmizer T-Cell Expansion SFM, no phenol red
 CTS AIM-V SFM
 CTS AIM-V Medium, without phenol red, without antibiotics
 Custom media and services

Gibco cell culture supplements

CTS GlutaMAX-I Supplement
 CTS Immune Cell SR

Thermo Scientific equipment

Herasafe 2030i biological safety cabinets
 Heracell VIOS CO₂ incubators
 Sorvall X4 Pro centrifuges

Gibco growth factors

GM-CSF
 Interleukin 2
 Interleukin 4
 Interleukin 7
 Interleukin 15



Wash and cryopreservation

Gibco wash

CTS DPBS, without calcium chloride, without magnesium chloride

Gibco cryopreservation

CTS Synth-a-Freeze Medium

Thermo Scientific cryopreservation

CryoMed System for controlled-rate freezing
 CryoPlus Storage System
 Nunc Internally Threaded Universal Cryotubes



Lot release and characterization

Applied Biosystems assays

PureQuant CD8+ T Cell Assay
 PureQuant Treg Assay
 PureQuant Th17 Assay
 MycoSEQ Mycoplasma Detection Kit
 resDNASEQ Human Residual DNA Quantitation Kit
 resDNASEQ Quantitative HEK293 DNA Kit with PrepSEQ Residual DNA Sample Preparation Kit
 AmpFLSTR Identifier Direct PCR Amplification Kit

Invitrogen assays

eBioscience Essential Human Treg Phenotyping Kit
 eBioscience Essential Human Th1/Th17 Phenotyping Kit
 eBioscience Essential Human T-Cell Phenotyping Kit
 CyQUANT LDH Cytotoxicity Assay
 ProcartaPlex multiplex immunoassays

Invitrogen instrumentation

Attune NxT Acoustic Focusing Cytometer
 Attune NxT Software 21 CFR Part 11
 CytKick Autosampler

Thermo Scientific assay

Pierce LAL Chromogenic Endotoxin Quantitation Kit

For more information, see the cell therapy characterization section (p. 20)

Workflow solutions cont.

Pluripotent stem cell therapy

Gibco™ CTS™ Essential 8™ Medium—the first globally available human pluripotent stem cell (hPSC) culture medium without components derived directly from animals. Based on the widely cited Gibco™ Essential 8™ Medium, CTS Essential 8 Medium:

- Enables seamless transition—same defined and highly consistent eight-component formulation as RUO Essential 8 Medium but with components not directly derived from animals
- Supports long-term PSC culture—maintains PSC marker expression, trilineage differentiation potential, and a normal karyotype over multiple passages

Gibco™ CTS™ Vitronectin (VTN-N) Recombinant Human Protein—a defined matrix for feeder-free culture of PSCs. Designed in the laboratory of James Thomson for use with the Essential 8 system, this protein is:

- A recombinant matrix that reduces variability and contamination risk in PSC cultures
- An optimized VTN-N variant that was shown to support hPSC attachment and survival better than wild type vitronectin [10]
- Able to maintain pluripotency, normal growth characteristics, trilineage differentiation potential, and a normal karyotype after extended culture

Gibco™ CTS™ KnockOut™ SR XenoFree Medium—a defined, product-level xeno-free serum replacement based on the traditional Gibco™ KnockOut™ Serum Replacement, which has been cited in more than 2,000 publications and trusted for over 20 years. CTS KnockOut SR XenoFree Medium is:

- Able to maintain the pluripotency, normal morphology, and karyotype of hPSCs
- Versatile—can also be used for cryopreservation, derivation, and differentiation of PSCs

Complete and cost-effective solution for qualification of hPSC lines—we offer a variety of methods to help you characterize your hPSC lines so you can move your research forward with confidence.

- PluriTest™ tool-compatible Applied Biosystems™ PrimeView™ global gene expression profile assays
- Applied Biosystems™ TaqMan® hPSC ScoreCard™ Panel
- Applied Biosystems™ KaryoStat™ assays

Learn more about CTS products for pluripotent stem cell research at thermofisher.com/ctsstemcells and thermofisher.com/characterization

For ordering information, go to page 30



Isolation

Gibco media

(PBMC/CD34 cells)
StemPro-34 SFM

(Fibroblasts) CTS KnockOut
SR XenoFree

Gibco dissociation reagents

CTS TrypLE Select Enzyme

CTS Versene Solution



Reprogramming

Invitrogen reprogramming kit

CTS CytoTune-iPS 2.1 Sendai
Reprogramming Kit

Invitrogen transfection reagents

(Fibroblasts) Lipofectamine 3000
Transfection Reagent

Invitrogen electroporation device

Neon Transfection System



Banking and recovery

Gibco cryopreservation

CTS Synth-a-Freeze Medium

CTS PSC Cryopreservation Kit

CTS PSC Cryomedium

Gibco recovery

CTS RevitaCell Supplement

CTS Essential 8 Medium/CTS VTN-N

rh-Laminin 521

Thermo Scientific equipment

Liquid handling instrumentation

Biological safety cabinets

Cryogenic storage consumables

Ultra-low and cryogenic freezers



Expansion and gene editing

Gibco expansion media systems

CTS Essential 8 Medium

CTS VTN-N

CTS KnockOut SR XenoFree

CTS KnockOut DMEM/F-12

CTS KnockOut DMEM

CTS Essential 6 Medium

CTS Versene Solution

Custom media and services

Invitrogen gene editing

CRISPR-Cas9 products and services

Designer TALEN products and services

Lipofectamine Stem

Transfection Reagent

Lipofectamine MessengerMAX

Transfection Reagent

Neon Transfection Instrument

Thermo Scientific single-use technologies

BioProcess Containers (BPCs)

Transfer assemblies

Static bags

Rocker bags

Equipment and consumables



Differentiation

Gibco differentiation reagents

PSC Cardiomyocyte Differentiation Kit

PSC Dopaminergic Neuron
Differentiation Kit

PSC Definitive Endoderm Induction Kit

CTS N-2 Supplement

CTS KnockOut DMEM/F-12

CTS Neurobasal Medium

CTS Neurobasal-A Medium

CultureOne Supplement

CTS PSC Cryopreservation Kit

Gibco growth factors

TGF- β 1

Stem Cell Factor (SCF)

FLT 3 Ligand

FGF Basic Full Length



Wash, fill, finish, and cryo

Gibco wash

CTS DPBS

Gibco cryopreservation medium

CTS Synth-a-Freeze Medium

CTS PSC Cryopreservation Kit

CTS PSC Cryomedium

Cryogenic storage and logistics

Thermo Scientific Nalgene and
Nunc cryotubes

Banking services

Cold-chain logistics solutions

Thermo Scientific ultra-low and
cryogenic storage freezers

Thermo Scientific ultra-low and
cryogenic storage freezers



Characterization

Applied Biosystems characterization products

PrimeView global gene expression
profile assays

TaqMan hPSC ScoreCard Panel

KaryoStat assays

For more information, see the cell therapy characterization section (p. 20)

Mesenchymal stem cell therapy research

Gibco™ StemPro™ MSC SFM XenoFree—a serum-free, xeno-free medium developed for the growth and expansion of human mesenchymal stem cells (MSCs) and adipose-derived stem cells (ADSCs) under completely serum-free and xeno-free conditions.

- Enables expansion for multiple passages while maintaining multipotent phenotype (e.g., the ability to differentiate into osteogenic, chondrogenic, and adipogenic lineages)
- cGMP-compliant, allowing for traceability and manufacturing reliability

Gibco™ StemPro™ MSC SFM—a serum-free medium (SFM) specially formulated for the growth and expansion of human mesenchymal stem cells (MSCs) and human adipose-derived stem cells (ADSCs).

- Enables superior human MSC growth and increased consistency compared to classical serum-supplemented medium (DMEM + 10% FBS)
- Using StemPro MSC SFM, human MSCs can be expanded beyond 5 passages while still maintaining their trilineage mesoderm differentiation potential
- Human MSCs grown in serum-supplemented media can be transitioned directly into StemPro MSC SFM with little or no adaptation required

Gibco™ CELLstart™ Substrate—a defined substrate developed for stem cell attachment under serum-free conditions that contains only components of human origin (product-level xeno-free)

- Can be used for MSC, NSC, and PSC attachment under serum-free conditions
- Defined formulation provides improved lot consistency

Gibco™ StemPro™ Differentiation Kits—developed for standardized differentiation of human mesenchymal stem cells (MSCs) in culture, these kits contain all reagents required for inducing MSCs to become committed to trilineage pathways.

- Complements cell expansion systems containing StemPro MSC SFM, StemPro™ MSC SFM XenoFree, MesenPRO RS™ Medium, and MSC-Qualified FBS
- Know your cells have retained trilineage differentiation potential via reliable induction of human MSCs into osteocytes, chondrocytes, and adipocytes
- Each lot is performance-qualified by PCR and its ability to support differentiation of human MSCs

Learn more about CTS products for stem cell research at [thermofisher.com/msc](https://www.thermofisher.com/msc)

For ordering information, go to page 30



Isolation

Gibco cells

StemPro BM Mesenchymal Stem Cells*
 StemPro Human Adipose-Derived Stem Cells
 Custom cells and services

Thermo Scientific cell culture plastics

Nunc cell cultureware

* For Research Use Only. For information on obtaining additional rights, please contact outlicensing@thermofisher.com.



Expansion

Gibco expansion media systems

StemPro MSC SFM XenoFree
 StemPro MSC SFM
 MesenPRO RS Medium
 MSC-Qualified FBS
 CELLstart Substrate
 CTS GlutaMAX-I Supplement
 DMEM classical media
 Custom media and services

Gibco differentiation media and enzymes

StemPro Osteogenesis Differentiation Kit
 StemPro Chondrogenesis Differentiation Kit
 StemPro Adipogenesis Differentiation Kit
 CTS TrypLE Select Enzyme

Gibco growth factors

TGF-β 1
 FGF-Basic
 PDGF-bb

Thermo Scientific single-use technologies

Bioreactors/liners
 Transfer assemblies
 Cell culture factories
 Equipment and consumables

Thermo Scientific cell culture and bioproduction systems

Nunc cell cultureware
 Equipment and consumables



Wash, fill, finish, and cryo

Gibco wash

CTS DPBS

Cryogenic storage

Thermo Scientific Nalgene and Nunc cryotubes
 Biobanking services
 Cold-chain logistics solutions
 Thermo Scientific ultra-low and cryogenic freezers



Lot release and characterization

Lot-release testing

Safety
 Identity
 Potency
 Purity

In-process characterization

Functional analysis
 Cellular analysis
 Protein analysis
 Genetic analysis

For more information, see the cell therapy characterization section (p. 20)

Workflow solutions cont.

Hematopoietic stem cell therapy research

Gibco™ StemPro™-34 SFM—a serum-free medium (SFM) specifically formulated to support the development of human hematopoietic stem cells (HSCs) in culture.

- Enables superior expansion of CD34⁺ cells compared to classical serum-supplemented medium (IMDM + FBS and cytokines)
- Appropriate for HSCs isolated from bone marrow, peripheral blood, or cord blood
- Manufactured without cytokines and hematopoietic growth factors, allowing freedom to use any factor or combination of factors required for your studies

Invitrogen™ Dynabeads™ CD34 Positive Isolation Kit—used to isolate human CD34⁺ progenitor cells for cell therapy research.

- Positive isolation of human CD34⁺ progenitor stem cells with bead release
- Stem cells can be isolated directly from whole or cord blood, or bone marrow
- Isolated CD34⁺ cells can be used in any application (i.e., they can be differentiated into dendritic cells or natural killer cells)

Thermo Scientific™ CO₂ incubators—optimized cell growth through advanced design and technology.

- HEPA air filtration surrounds cell with clean room–like air quality
- High-temperature decontamination features maximize efficiency by eliminating the need for separate autoclaving and reassembly of components
- Simplified touchscreen user interfaces provide ease of use and real-time data
- Wireless monitoring options for regulatory peace of mind and compliance

Learn more about CTS products for stem cell research at [thermofisher.com/hsc](https://www.thermofisher.com/hsc) and [thermofisher.com/cellculture](https://www.thermofisher.com/cellculture)

For ordering information, go to page 30





Isolation

Gibco isolation

Dynabeads CD34 Positive Isolation Kit
DynaMag magnets

Thermo Scientific cell culture plastics

Nunc cell cultureware



Expansion

Gibco expansion media systems

StemPro-34 SFM
Custom media and services
CTS GlutaMAX-I Supplement

Gibco growth factors

IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, GM-CSF, SCF, FLT3 ligand, TPO, M-CSF

Thermo Scientific single-use technologies

Bioreactors/liners
Transfer assemblies
Equipment and consumables

Thermo Scientific cell culture and bioproduction systems

Cell culture factories
Equipment and consumables



Wash, fill, finish, and cryo

Gibco wash

CTS DPBS

Gibco cryopreservation medium

CTS Synth-a-Freeze Medium

Cryogenic storage

Thermo Scientific Nalgene and Nunc cryotubes
Biobanking services
Cold-chain logistics solutions
Thermo Scientific ultra-low and cryogenic freezers



Lot release and characterization

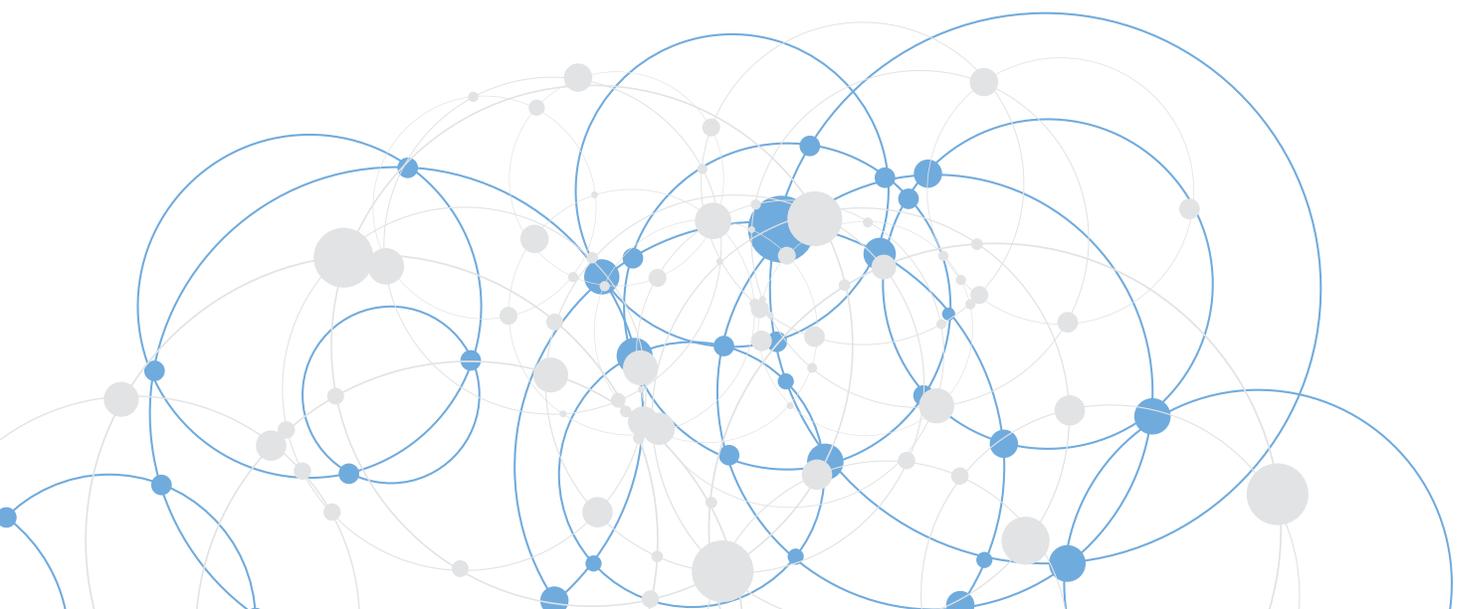
Lot-release testing

Safety
Identity
Potency
Purity

In-process characterization

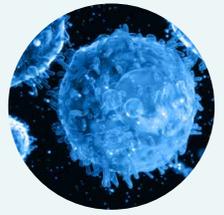
Functional analysis
Cellular analysis
Protein analysis
Genetic analysis

For more informatin, see the cell therapy characterization section (p. 20)

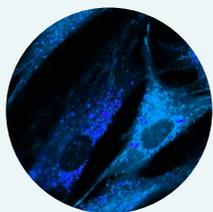
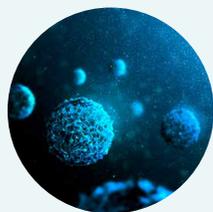


Workflow solutions cont.

Cell therapy selection guide



Learn more at [thermofisher.com/celltherapy](https://www.thermofisher.com/celltherapy). For ordering information, go to page 30

**MSC****PSC****NSC****HSC**

StemPro MSC SFM XenoFree StemPro MSC SFM MesenPRO RS Medium MSC-Qualified FBS DMEM classical media	CTS Essential 6 Medium CTS Essential 8 Medium CTS KnockOut SR XenoFree Medium CTS KnockOut DMEM	CTS KnockOut DMEM/F-12 CTS N-2 Supplement CultureOne Supplement B-27 XenoFree Supplement	StemPro-34 SFM
FGF-Basic TGF- β 1 PDGF-bb	FGF-Basic TGF- β 1 SCF FLT3 ligand BMP-4 EGF Activin A	FGF-Basic EGF	IL-2 SCF IL-3 GM-CSF IL-4 FLT3 ligand IL-5 TPO IL-6 M-CSF IL-7
CELLstart Substrate CTS Vitronectin	CTS Vitronectin rh-Laminin 521	CELLstart Substrate	NA
L-Glutamine StemPro Osteogenesis Differentiation Kit StemPro Chondrogenesis Differentiation Kit StemPro Adipogenesis Differentiation Kit CTS DPBS CTS GlutaMAX-I Supplement CTS TrypLE Select Enzyme Lipofectamine Stem Transfection Reagent	CTS CytoTune-iPS 2.1 Sendai Reprogramming Kit PSC Cardiomyocyte Differentiation Kit PSC Dopaminergic Neuron Differentiation Kit PSC Definitive Endoderm Induction Kit CTS DPBS CTS GlutaMAX-I Supplement CTS TrypLE Select Enzyme Lipofectamine Stem Transfection Reagent	CTS DPBS CTS GlutaMAX-I Supplement CTS TrypLE Select Enzyme Lipofectamine Stem Transfection Reagent	Dynabeads CD34 Positive Isolation Kit CTS DPBS CTS GlutaMAX-I Supplement
CTS Synth-a-Freeze Medium	CTS Synth-a-Freeze Medium CTS PSC Cryopreservation Kit CTS PSC Cryomedium	CTS Synth-a-Freeze Medium	CTS Synth-a-Freeze Medium

Cell therapy characterization

Tools for in-process and lot-release development testing

Invitrogen™ Attune™ NxT Flow Cytometer—combines precision with performance in a true benchtop flow cytometer with up to 4 lasers and 16 parameters of detection.

- Clog-resistant design, acoustic focusing technology, and high-quality fluidics help prevent loss of precious samples and enable analysis of difficult sample types like tumors
- Delivers a superior level of data fidelity at speeds up to 10 times faster than other flow cytometers
- The CytKick plate autosampler enables true walk-away automation on conventional and deep well 96-well or 384-well plates
- Includes the option to purchase access to 21 CFR part 11 software for security, auditing, and electronic signatures

Applied Biosystems™ MycoSEQ™ Mycoplasma

Detection Kits—these allow for highly sensitive, specific, and comprehensive detection of more than 90 mycoplasma species. These kits are designed for the routine screening and detection of mycoplasmas and closely related species such as *Acholeplasma laidlawii* and *Spiroplasma citri*, and they meet European Pharmacopoeia guidance.

- Highly optimized sample preparation and same-day results allow for in-process testing (results typically obtained in <5 hr)
- Demonstrated sensitivity to detect <10 CFU/mL
- Widely used and validated by users in biopharma
- Include application support to guide you through the validation process

Learn more at [thermofisher.com/celltherapy](https://www.thermofisher.com/celltherapy)

Cell health and identity reagents

Cell viability—choose from a selection of Invitrogen viability dyes and assays.

Cell proliferation—Invitrogen™ Click-iT™ EdU assays provide:

- Quantitation of newly synthesized DNA
- Detection without denaturation of DNA
- Compatibility with sensitive R-PE tandems and fluorescent proteins
- An alternative to the cumbersome BrdU assay

Detection of cell populations—permanently label cells with fluorescent stains to trace generations or divisions without affecting morphology or physiology. Invitrogen™ CellTrace™ cell proliferation kits offer:

- Cell tracking *in vitro* or *in vivo*
- Bright, single-peak staining
- Long-term signal stability

Phenotyping—optimized protocols and antibodies to accelerate multiparameter experiment success.

- Broad portfolio of immunology targets
- Directly conjugated antibodies that support 18 standard channels
- Simplified and standardized intracellular buffers and protocols

Applied Biosystems™ PureQuant™ assays—these qPCR-based assays, based on Applied Biosystems™ TaqMan® Assay technology, can accurately identify and quantify specific immune cell types in a mixed population of cells.

- **Proven performance**—core technology has been used for identification and quantification of immune cell types for over a decade
- **Easily standardized**—qPCR method enables consistent results across multiple users, instruments, and sites
- **Facilitates regulatory filings**—established performance specifications following ICH Q2(R1) guidelines

Cell therapy characterization capabilities

We offer a wide variety of analytical platforms and assays to support cell therapy development.

	Assay type	Assay platform	Products	Instrument
Identity, purity, potency	Biomarker profiling	Flow cytometry	Antibodies and reagents	Attune NxT Flow Cytometer
		Luminex xMAP	Multiplex assays	MAGPIX, Luminex 200, or FLEXMAP 3D systems
		ELISA	Invitrogen ELISAs	ELISA plate reader
		HCS	Antibodies and reagents	CellInsight CX7 LZR system
		ICC	Antibodies and reagents	EVOS M7000 Imaging System
		IP	Antibodies	Fluoroskan fluorometer
	Functional	Flow cytometry	Antibodies and reagents	Attune NxT Flow Cytometer
		Luminex xMAP	Luminex multiplex assays, QuantiGene Plex assays,	Luminex 200 with xPONENT 3.1, MAGPIX, Luminex 200, and FLEXMAP 3D systems
	Molecular	PCR-based	PureQuant Assays, custom TaqMan primers and probes	QuantStudio real-time PCR instruments
		Array-based	Human Genome U219 and U133 arrays, Clariom S and D Assays	GeneChip Scanner 3000, GeneAtlas, and GeneTitan instruments
NGS-based		Ion AmpliSeq panels and OncoPrint assays	Ion GeneStudio S5 systems	
Genomic stability/safety	Genomic stability	Array-based	KaryoStat and KaryoStat HD assays	GeneChip Scanner 3000 instrument
	HLA typing	Reverse sequence-specific oligonucleotide typing (rSSO)-Luminex xMAP	LABType rSSO	LABScan3D instrument
		Sanger sequencing	SeCore SBT kit	Applied Biosystems 3100, 3730, 3500xL, and 3500xL Dx Genetic Analyzers
	Sample tracking and authentication	Capillary electrophoresis	Identifiler STR assays	Thermal cycler and 3500, 3500xL, and SeqStudio Genetic Analyzers
	Mycoplasma	SYBR Green RT-PCR	Mycoseq kits	Applied Biosystems 7500 Fast Real-Time PCR System
	Endotoxin	Chromogenic assay	Pierce LAL Chromogenic Endotoxin Kit	Multiskan Sky Plate Reader



Success story: providing professional support for raw materials used in clinical manufacturing



Situation

A biotech customer developing a novel cell therapy was in need of a cell culture system for efficient expansion of cells while maintaining cell phenotype and function.

Solution

We communicated with the company to understand their raw material and quality requirements and worked with their team to evaluate CTS OpTmizer SFM in combination with CTS Immune Cell Serum Replacement.

Results

The customer was able to achieve the required cell numbers with the correct phenotype in a serum-free environment while reducing the risk of both lot-to-lot variability and supply issues associated with human serum. They are now using CTS OpTmizer SFM in combination with CTS Immune Cell Serum Replacement in their commercial cell therapy manufacturing process.

Discovery and translation

Broad capabilities to support your journey

Careful selection of materials and thoughtful development decisions early in the process can help ease the transition to a scalable and robust cell production process. Gibco CTS products are designed to help you translate your cell therapy to clinical applications with extensive safety testing and traceability documentation to facilitate regulatory approval, so you can transition your cell therapy to the clinic with confidence.

Cell isolation

Dynabeads products for cell isolation and activation provide a trusted technology platform to isolate, activate, and expand T cells used in immunotherapy [1-3].

Cell expansion

Gibco cell culture represents over 50 years of applying deep scientific cell culture expertise. Our broad portfolio of media, reagents, and single-use technologies supports cost-effective research with complementary CTS products to support your transition to the clinic.

Media, reagents, and vessels

Choose from a broad array of off-the-shelf and custom media, reagents, and culture vessels to support your cell therapy research, including CTS media and reagents that are specifically designed for use in cell therapy applications, and extensive custom media and optimization capabilities. We also have an extensive portfolio of high-quality RUO products.

Single-use technologies

We have a wide range of standard and custom-configured single-use technologies for bioreactors, rotary platforms, and closed systems that include BPCs, transfer assemblies, static bags, and Rock-it bags. All of these offerings can be customized to meet your requirements.

Equipment and consumables

A comprehensive range of Thermo Scientific™ laboratory equipment, liquid handling equipment, and consumables, including biosafety cabinets, products for pipetting,

filtration devices, lab-water purification systems, CO₂ incubators, centrifuges, and cold storage equipment is available to maximize workflow efficiency.

Cell engineering

We offer complete cell engineering solutions to meet your gene editing and cell delivery needs, including transfection reagents, lentiviral transduction, electroporation, and proven gene editing tools and solutions.

Invitrogen™ Lipofectamine™ transfection reagents

These products are among the most trusted and cited due to their superior transfection performance with a broad spectrum of cell types.

Lentiviral transduction

We offer a complete solution for high-titer and cost-effective adherent and suspension viral vector production, including the Gibco™ CTS™ LV-MAX™ Lentiviral Production System, Thermo Scientific™ CaptureSelect™ affinity products for vector purification, and viral vector CDMO services.

Invitrogen™ Neon™ electroporation device

The innovative design of tips for the Neon system provides high transfection efficiency and cell viability, and the preprogrammed 24-well optimization protocols help decrease hands-on time.

CRISPR and TAL products and services

We offer both CRISPR-Cas9 and TAL effector genome editing tools, because we know the best fit depends on your application, cell type, target gene, and delivery method.

Our proven solutions are designed to help you accelerate your research. Whether you are looking to perform a gene knockout, knock-in, activation, or repression, know that we have a solution for you.



Success story: optimizing media format for savings and risk reduction

Situation

A large biotech company's drug formulation required four separate dry media components in their process.

- Each component requires a separate raw-material release test
- Multiple components require additional storage containers
- Formulation errors resulting from multiple components can be costly

Solution

Proposed format upgrade from dry powder media (DPM) to the Gibco™ Advanced Granulation Technology™ (AGT™) Format. We combined the DPM components into one powdered medium for their process.

Results

Reduction in on-site container inventory for storage and staff handling (one AGT format vs. four DPM components).

- Reduced total number of required raw-material release tests
- Gained formulation and mixing efficiencies due to single-component media and fast rehydration
- Reduced potential formulation errors (both on working floor and in QC)

Bioprocessing

Support at every step of the way

The unique demands of your business can only be met by working with a flexible, solutions-oriented partner who is focused on your success. Thermo Fisher Scientific is that partner. We offer integrated solutions across the workflow, custom packaging and media capabilities, and the ability to scale with you as your project grows. And our team of experienced professionals is ready to assist you in any way you need, whether with protocols, product transitions, or technical consultation.

Gibco cell culture

We offer a full array of innovative performance solutions and knowledge-based services, including:

- Gibco™ PD-Express Services—quality custom media development and optimization, including the Gibco™ Media Express™ custom media service
- Multiple media formats—including AGT media, dry powder media, liquid, and concentrated

Thermo Scientific™ single-use technologies

Our comprehensive suite of standard and custom-configured, single-use technologies includes rotary platforms as well as rigid and flexible containment solutions, such as bottles, flasks, pillow and 3D BPCs, transfer assemblies, cell factory systems, and cell culture bags. We also offer flexible control systems and bioreactors, both in rocking motion and stirred tank reactors.

Purification solutions

Our superior purification technology has been used in numerous commercial biotherapeutic downstream processes. Our affinity resins are available as a platform for purification of all AAV subtypes. We also offer affinity resins that are specially designed to purify AAV8 and AAV9 vectors. Combining the innovative CaptureSelect affinity technology and Thermo Scientific™ POROS™ large-pore beads allows for high-throughput chromatography of large biomolecules. Our proprietary technology provides high product purity in a single step while maximizing yield helping to simplify the purification process. We offer a novel platform with scalable resins designed for bench-scale to process-scale purification of a range of viral vectors.

Global facilities

We have a large network of fully owned cGMP facilities, strategically located around the world to support our customers. These state-of-the-art, ISO-certified facilities help ensure that we can supply the highest-quality products to all of our customers globally, uninterrupted. Our team will work closely with you to understand your demand and set safety stocks to keep you on a steady path to success.

Professional support

Bioproduction teams provide support for early phases through commercial scale-up and scale-out; this includes access to a large global supply of cell therapy-ready ancillary materials, equipment, and consumables for small-to large-scale manufacturing; characterization platforms to help confirm product quality and safety; and process development and media development services to help you achieve your goals in a cost-effective, efficient way.

Learn more at thermofisher.com/bioproduction

Clinical trial support and cold-chain logistics

Experience, resources, and expertise to guide you on your path toward commercialization

We have the global infrastructure to enable our customers to seamlessly conduct clinical trials across multiple regions, while providing patients around the world with access to life-changing therapies.

Kit production

We design customized collection and administration kits to drive consistency and standardization. The kits can include patient-specific identification labels and collection containers designed for:

- Pre-manufacture collection of biological samples
- Patient administration
- Post-administration sample collection

Secondary packaging and labeling

We offer client-specific secondary packaging and labeling for clinical distribution.

- Patient-specific identification labels and collection containers
- Chain-of-custody documentation
- Just-in-time options available for rapid deployment worldwide

Cold-chain logistics

From collection through manufacture to final clinical-site delivery, we have the knowledge and equipment required for transport of cellular therapies at cryogenic temperatures anywhere in the world.

- Global fleet of qualified cryogenic shippers
- Certified and trained in cGMP practices
- All shipments prepared according to SOP
- Continuous monitoring

GMP storage and monitoring

We provide professional assistance in storing cell therapy products from ambient to cryogenic temperatures.

- 24-hour temperature and humidity monitoring
- Facilities equipped with both uninterrupted power supply (UPS) systems and one or more back-up generators
- On-call staff, day or night, monitoring for temperature deviations of any unit from its acceptable range
- 21 CFR Part 11-compliant inventory management system

Qualification/validation services

By validating processes and qualifying equipment, we help ensure that risk is minimized, material integrity remains intact, and regulatory requirements are met throughout the chain of custody.

- Pack-out configurations based on maximum transit times, shipping routes, payloads, and temperature requirements
- Testing of dry shippers using mock material loads in different thermal environments
- Real-time transit studies using mock payloads
- Comprehensive report of qualification data provided in a timely manner

Learn more at fisherbioservices.com/market-solutions/cell-therapy



Clinical trial support and cold-chain logistics cont.

Success story: providing end-to-end clinical trial support, from cell collection through patient administration



Situation

A cell therapy company needed support for their complex Phase III trial. This multidose autologous therapy required blood samples from leukapheresis and tissue materials from patients in the US and Europe to be shipped to a manufacturing site in the US and distributed back to the 450 patients at 120 global clinical sites.

Solution

- Customized collection/shipping kits for temperature-specific, time-sensitive cell collection
- Short-term storage of material in GMP facility and management of cell-based API prior to manufacture
- Global cryogenic distribution to clinical sites using qualified equipment and validated processes to ensure compliance with global regulatory and quality standards

Results

- Project management support to develop customized solutions, fulfill client requests, and resolve challenges
- Reliable, reproducible chain of custody to ensure material integrity and viability
- Validated process to ensure consistency in each cell collection and distribution
- Cryogenic drug product management from point of manufacture to patient bedside

Learn more at fisherbioservices.com/market-solutions/cell-therapy



thermo scientific nunc
NU00003272

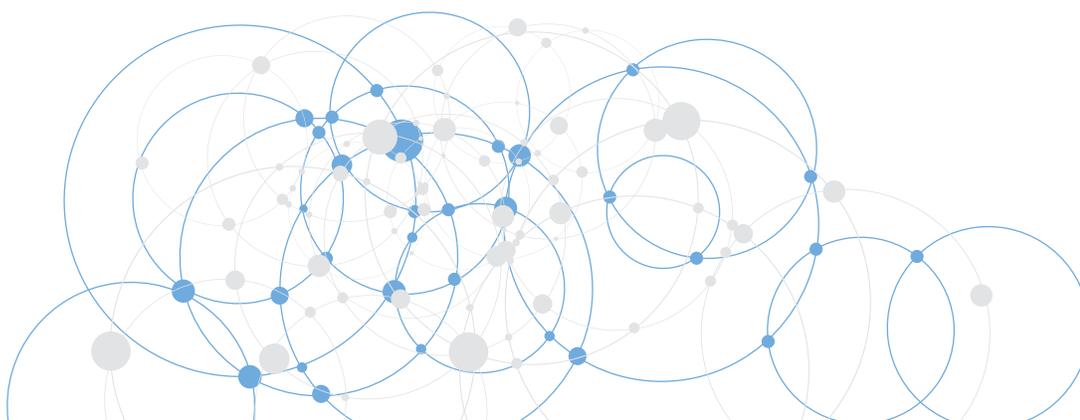
thermo scientific nunc
NU00003998

Ordering information

Cell type					Product	Quantity	Cat. No.
Immune cells	MSC	PSC	NSC	HSC			
Media and supplements							
■					CTS OpTmizer T Cell Expansion SFM [†]	1 L (bottle) kit 1 L (bag) kit	A1048501 A1048503
■					CTS OpTmizer T Cell Expansion SFM, no phenol red [†]	1 L (bottle) kit 1 L (bag) kit	A3705001 A3705003
■					CTS AIM V SFM [†]	1 L 10 L	0870112DK 0870112BK
■					CTS AIM V Medium, (-) gentamicin sulfate, (-) phenol red, (-) streptomycin sulfate [†]	1 L 10L	A3830801 A3830802
■					CTS Immune Cell SR [†]	50 mL 500 mL	A2596101 A2596102
	■				StemPro MSC SFM [§]	500 mL	A1033201
	■				StemPro MSC SFM XenoFree [§]	500 mL	A1067501
				■	StemPro-34 SFM [§]	500 mL	10639011
		■			CTS KnockOut SR XenoFree Medium [†]	100 mL 500 mL	12618012 12618013
		■			CTS KnockOut DMEM [†]	500 mL	A1286101
		■			CTS Essential 6 Medium [†]	500 mL	A4238501
		■			CTS Essential 8 Medium [†]	500 mL	A2656101
		■	■		CTS KnockOut DMEM/F-12 [†]	500 mL	A1370801
			■		CTS N-2 Supplement [†]	5 mL	A1370701
			■		CTS Neurobasal Medium [†]	500 mL	A1371201
			■		CTS Neurobasal-A Medium [†]	500 mL	A1371001
			■		CultureOne Supplement [§]	5 mL	A3320201
Growth factors and cytokines							
■				■	IL-2 Recombinant Human Protein [§]	100 µg	PHC0021
				■	IL-3 Recombinant Human Protein [§]	100 µg	PHC0031
■				■	IL-4 Recombinant Human Protein [§]	100 µg	PHC0041
				■	IL-5 Recombinant Human Protein [§]	10 µg	PHC0055
■				■	IL-6 Recombinant Human Protein [§]	100 µg	PHC0061
■				■	IL-7 Recombinant Human Protein [§]	100 µg	PHC0071
■					IL-15 Recombinant Human Protein [§]	100 µg	PHC9151
■					IL-21 Recombinant Human Protein [§]	100 µg	PHC0211
■				■	GM-CSF Recombinant Human Protein [§]	100 µg	PHC2011
■					TNF-α Recombinant Human Protein [§]	100 µg	PHC3011
	■	■	■		FGF-Basic Full Length Recombinant Human Protein [§]	100 µg	PHG0261
		■		■	Stem Cell Factor Recombinant Human Protein [§]	100 µg	PHC2111
	■	■			TGF-β 1 Recombinant Human Protein [§]	100 µg	PHG9211
		■		■	FLT3 Ligand Recombinant Human Protein [§]	100 µg	PHC9411

Ordering information

Cell type					Product	Quantity	Cat. No.
Immune cells	MSC	PSC	NSC	HSC			
Growth factors and cytokines (cont.)							
	■				PDGF-BB Recombinant Human Protein [§]	100 µg	PHG0041
					M-CSF Recombinant Human Protein [§]	100 µg	PHC9501
		■	■		EGF Recombinant Human Protein [§]	100 µg	PHG0311
				■	TPO (Thrombopoietin) Recombinant Human Protein [§]	100 µg	PHC9511
Extracellular matrices							
	■		■		CELLstart Substrate [§]	2 mL	A1014201
	■	■			CTS Vitronectin (VTN-N) Recombinant Human Protein, Truncated [†]	1 mL	A27940
			■		rh-Laminin 521 [§]	100 µg 1 mg	A29248 A29249
Reagents							
	■				StemPro BM Mesenchymal Stem Cells [§]	1 x 10 ⁶ cells	A15652
	■				StemPro Human Adipose-Derived Stem Cells [§]	1 x 10 ⁶ cells	R7788115
■					CTS Dynabeads CD3/CD28 [†]	10 mL	40203D
■					CTS Dynabeads Treg Xpander [†]	10 mL	46000D
				■	Dynabeads CD34 Positive Isolation Kit [§]	5 mL	11301D
■					CTS DynaMag Magnet [†]	1 each	12102
■	■	■	■	■	CTS GlutaMAX-I Supplement [†]	100 mL	A1286001
■	■			■	L-Glutamine ^{††}	100 mL	25030081
■	■	■	■	■	CTS DPBS with calcium and magnesium [†]	1 L	A1285801
■	■	■	■	■	CTS DPBS without calcium and magnesium [†]	1 L	A1285601
	■	■	■		CTS TrypLE Select Enzyme [†]	100 mL	A1285901
		■			CTS Versene Solution [†]	100 mL	A4239101
		■			CTS CytoTune-iPS 2.1 Sendai Reprogramming Kit [†]	1 kit	A34546
		■			PSC Definitive Endoderm Induction Kit [§]	1 kit	A3062601
Preservation media							
■	■	■	■	■	CTS Synth-a-Freeze Medium [†]	50 mL	A1371301
		■			CTS PSC Cryopreservation Kit [†]	1 kit	A4239301
		■			CTS RevitaCell Supplement (100X) [†]	5 mL	A4238401
			■		CTS Hibernate-A Medium [†]	500 mL	A1370501
			■		CTS Hibernate-E Medium [†]	500 mL	A1370601
		■			CTS PSC Cryomedium [†]	50 mL	A4238801



Ordering information

Product	Quantity	Cat. No.
Suspension lentiviral production system		
LV-MAX Lentiviral Production System Starter Kit [§]	For 0.3 L of LV vector production	A35684
LV-MAX Production Medium [§]	1 L	A3583401
	6 x 1 L	A3583402
LV-MAX Transfection Kit [§]	For 1 L of LV vector production	A35348
LV-MAX Lentiviral Packaging Mix [§]	1.5 mL	A43237
	1,000 mL	A4124001
CTS LV-MAX Production Medium [†]	6 x 1 L	A4124004
	10 L	A4124002
	20 L	A4124003
CTS LV-MAX Transfection Kit [†]	1 L	A4132601
	10 L	A4132602
LV-MAX production system components		
LV-MAX Production Medium [§]	1 L	A3583401
	6 x 1 L	A3583402
LV-MAX Transfection Kit [§]	For 1 L of culture	A35348
Viral production cells [§]	1 mL (1 x 10 ⁷ cells/mL)	A35347
	6 x 1 mL (1 x 10 ⁷ cells/mL)	A35827
Transfection reagents		
Lipofectamine MessengerMAX Reagent [§]	1.5 mL	LMRNA015
Lipofectamine 3000 Transfection Reagent [§]	1.5 mL	L3000015
Lipofectamine 2000 CD Transfection Reagent [§]	1 mL	12566014
Gene editing products		
TrueCut Cas9 Protein (Prototype) [§]	2.5 mg	A45220P
	5.0 mg	A45221P
TrueCut Cas9 Protein v2 (1 mg/mL) [§]	10 µg	A36496
	25 µg	A36497
	100 µg	A36498
TrueCut Cas9 Protein v2 (5 mg/mL) [§]	500 µg	A36499
	100 µL	A32064
LentiArray Cas9 Lentivirus, 1 x 10 ⁷ TU/mL [§]	1 mL	A32069
	3 nmol	A35533
TrueGuide sgRNA, modified predefined [§]	3 nmol	A35534
TrueGuide sgRNA, modified custom [§]	3 nmol	A35534
LentiArray Lentiviral sgRNA, 1 x 10 ⁸ TU/mL [§]	200 µL	A32042
Electroporation devices		
Neon Transfection System Starter Pack [§]	1 starter pack	MPK5000S
Quality and safety testing		
Mycoseq Mycoplasma Detection Kit [§]	100 reactions	4460626
resDNASEQ Human Residual DNA Quantitation [§]	100 reactions	A27335
CaptureSelect AVB Sepharose HP Leakage ELISA Kit [§]	1 assay	810280801
	10 assays	810280810
CaptureSelect AAVX Ligand Leakage ELISA [§]	1 assay	810352201
	10 assays	810352210
CaptureSelect AAV9 Ligand Leakage ELISA Kit [§]	1 assay	810333001
	10 assays	810333010
CaptureSelect AAV8 Ligand Leakage ELISA Kit [§]	1 assay	810338001
	10 assays	810338010

Ordering information

Product	Quantity	Cat. No.
Purification	10 mL	A36739
	25 mL	A36740
	50 mL	A36741
	250 mL	A36742
	1,000 mL	A36743
	5,000 mL	A36744
	10,000 mL	A36745
POROS CaptureSelect AAVX Affinity Resin ^{††}	10 mL	A30789
	25 mL	A30790
	50 mL	A30791
	250 mL	A30792
	1,000 mL	A30793
	5,000 mL	A30794
	10,000 mL	A30795
POROS CaptureSelect AAV8 Affinity Resin ^{††}	10 mL	A27354
	25 mL	A27353
	50 mL	A27356
	250 mL	A27355
	1,000 mL	A27359
	5,000 mL	A27358
	10,000 mL	A27357
POROS CaptureSelect AAV9 Affinity Resin ^{††}	10 mL	A27354
	25 mL	A27353
	50 mL	A27356
	250 mL	A27355
	1,000 mL	A27359
	5,000 mL	A27358
	10,000 mL	A27357

* For *In Vitro* Diagnostic Use.

† For Research Use or Non-Commercial Manufacturing of Cell-Based Products for Clinical Research. CAUTION: Not intended for direct administration into humans or animals.

‡ For Research Use or Manufacturing of Cell, Gene, or Tissue-Based Products. CAUTION: Not intended for direct administration into humans or animals.

§ For Research Use Only. Not for use in diagnostic procedures.

†† For Research Use or Further Manufacturing. Not for diagnostic use or direct administration into humans or animals.

Ordering information

Product description	Voltage and frequency	Cat. No.
Thermo Scientific General Purpose Pro Centrifuges – CTS Series Complete validation packages*		
Thermo Scientific Sorvall X4R Pro Cell Therapy Centrifuge Package CTS Series, Factory Acceptance Testing Documentation, IQ/OQ Field Services	220-240 V, 50/60 Hz	75009014
	220 V, 60 Hz	75009015
	120 V	75009016
	100 V	75009017
Thermo Scientific Multifuge X4R Pro Cell Therapy Centrifuge Package CTS Series Factory Acceptance Testing Documentation, IQ/PQ Field Services	220-240 V, 50/60 Hz	75009023
Factory acceptance compliance packages		
Thermo Scientific Sorvall X4R Pro Cell Therapy Centrifuge Package CTS Series, Factory Acceptance Testing Documentation	220-240 V, 50/60 Hz	75009018
	220 V, 60 Hz	75009019
	120 V	75009020
	100 V	75009021
Thermo Scientific Multifuge X4R Pro Cell Therapy Centrifuge Package CTS Series, Factory Acceptance Testing Documentation	220-240 V, 50/60 Hz	75009009

* Complete validation packages are only available in selected locations including the United States, Germany, France, the United Kingdom, Ireland, Spain, Portugal, Italy, Austria, Switzerland, Norway, Sweden, Denmark, and the Netherlands. For more information, contact your local representative.

Ordering information

Product					Cat. No.
Thermo Scientific CO ₂ incubators	Interior	Electrical	Sensor	Volume	
Heracell VIOS 160i with Steri-Run high-temperature sterilization cycle and HEPA air filtration [§]	Stainless steel	120 V, 50–60 Hz	TC180	5.8 ft ³ (165 L)	51030285
		230 V, 50–60 Hz			51030287
	100% copper	120 V, 50–60 Hz			51030284
		230 V, 50–60 Hz			51032086
Heracell VIOS 250i with Steri-Run high-temperature sterilization cycle and HEPA air filtration [§]	Stainless steel	120 V, 50–60 Hz	TC180	9.0 ft ³ (255 L)	51030964
		230 V, 50–60 Hz			51030966
	100% copper	120 V, 50–60 Hz			51030963
		230 V, 50–60 Hz			51030965
Heracell VIOS 160i with Steri-Run high-temperature sterilization cycle and HEPA air filtration [§]	Stainless steel	120 V, 50–60 Hz	IR180Si	5.8 ft ³ (165 L)	51030400
		230 V, 50–60 Hz			51030478
	100% copper	120 V, 50–60 Hz			51030401
		230 V, 50–60 Hz			51030476
Heracell VIOS 250i with Steri-Run high-temperature sterilization cycle and HEPA air filtration [§]	Stainless steel	120 V, 50–60 Hz	TC180	9.0 ft ³ (255 L)	51030994
		230 V, 50–60 Hz			51030994
	100% copper	120 V, 50–60 Hz			51030991
		230 V, 50–60 Hz			51030993
Forma Steri-Cult high-volume CO ₂ incubators with HEPA filtration and high-temperature decontamination [§]	Stainless steel	115 V, 50–60 Hz	IR	11.4 ft ³ (323 L)	3310
		230 V, 50–60 Hz	IR		3311
		115 V, 50–60 Hz	IR	8.2 ft ³ (232 L)	3307TS
		230 V, 50–60 Hz	IR		3308

Ordering information

Product description	Electrical	Cat. No.
Thermo Scientific Forma Steri-Cult CO₂ Incubators – CTS Series Complete validation packages*		
Electropolished Stainless Steel 8.2 cu. ft. (232.2 L), Factory Acceptance Testing Documentation, IQ/OQ Field Service	115V	3307CTS
	230V	3308CTS
Electropolished Stainless Steel 11.4 cu. ft. (322.8 L), Factory Acceptance Testing Documentation, IQ/OQ Field Service	115V	3310CTS
	230V	3311CTS
Factory acceptance compliance packages		
Electropolished Stainless Steel 8.2 cu. ft. (232.2 L), Factory Acceptance Testing Documentation	115V	3307E
	230V	3308E
Electropolished Stainless Steel 11.4 cu. ft. (322.8 L), Factory Acceptance Testing Documentation	115V	3310E
	230V	3311E
Accessories		
Smart-View Wireless Radio Module (North America only)		SV210-200-LSB
Smart-View Temperature and CO ₂ Sensor, 1 m cable length		SV406-200-LSB
Electropolished Stainless Steel Reinforced Shelf 11.4 cu. ft. (322.8 L)		192104

All models in the CTS Series come complete with IR CO₂ sensor, 4–20 mA data output, and electropolished stainless steel interior.

* Complete validation packages are only available in selected locations including the United States, Germany, France, the United Kingdom, Ireland, Spain, Portugal, Italy, Austria, Switzerland, Norway, Sweden, Denmark, and the Netherlands. For more information, contact your local representative.

Ordering information

Product description	Chamber volume	Electrical (plug type)	Cat. No.
Thermo Scientific CryoMed Controlled-Rate Freezers – CTS Series*			
Thermo Scientific CryoMed Controlled-Rate Freezer Cell Therapy Package CTS Series, Factory Acceptance Test Documentation, and IQ/OQ Field Services	0.6 cu. ft. / 17 L	120 v/60 Hz (NEMA 5-15P)	7450CTS
	1.2 cu. ft. / 34 L		7452CTS
	1.7 cu. ft. / 48 L		7454CTS
Thermo Scientific CryoMed Controlled-Rate Freezer and Factory Acceptance Test Documentation	0.6 cu. ft. / 17 L	120 v/60 Hz (NEMA 5-15P)	7450B
	1.2 cu. ft. / 34 L		7452B
	1.7 cu. ft. / 48 L		7454B

* These products are only available to customers in North America. For more information, contact your local representative.

Ordering information

Product description	Includes	Electrical	Cat. No.
Thermo Scientific Herasafe 2030i Biological Safety Cabinets – CTS Series			
Herasafe 2030i, 0.9 m Class 2 A2 Biological Safety Cabinets	Cross Beam UV-C, Factory Acceptance Package, IQ/OQ Field Service	230 V, 50/60 Hz	51033634
Herasafe 2030i, 1.2 m Class 2 A2 Biological Safety Cabinets	Cross Beam UV-C, Factory Acceptance Package, IQ/OQ Field Service	230 V, 50/60 Hz	51033635
Herasafe 2030i, 1.5 m Class 2 A2 Biological Safety Cabinets	Cross Beam UV-C, Factory Acceptance Package, IQ/OQ Field Service	230 V, 50/60 Hz	51033636
Herasafe 2030i, 1.8 m Class 2 A2 Biological Safety Cabinets	Cross Beam UV-C, Factory Acceptance Package, IQ/OQ Field Service	230 V, 50/60 Hz	51033637
Herasafe 2030i, NSFCTS Series, 4 ft.	Cross Beam UV-C; Factory Acceptance Package, IQ/OQ Field Service; Indented Single-Piece Work Tray; Prep for 3x Service Taps (Rear Wall)	120 V, 60 Hz	51033638
Herasafe 2030i, NSFCTS Series, 6 ft.	Cross Beam UV-C; Factory Acceptance Package, IQ/OQ Field Service; Indented Single-Piece Work Tray; Prep for 3x Service Taps (Rear Wall)	120 V, 60 Hz	51033639
Factory acceptance compliance packages Complete validation packages*			
Herasafe 2030i, 0.9 m Class 2 A2 Biological Safety Cabinet – CTS Series	Cross Beam UV-C, Factory Acceptance Testing Documentation	230 V, 50/60 Hz	51033758
Herasafe 2030i, 1.2 m Class 2 A2 Biological Safety Cabinet – CTS Series	Cross Beam UV-C, Factory Acceptance Testing Documentation	230 V, 50/60 Hz	51033759
Herasafe 2030i, 1.5 m Class 2 A2 Biological Safety Cabinet – CTS Series	Cross Beam UV-C, Factory Acceptance Testing Documentation	230 V, 50/60 Hz	51033760
Herasafe 2030i, 1.8 m Class 2 A2 Biological Safety Cabinet – CTS Series	Cross Beam UV-C, Factory Acceptance Testing Documentation	230 V, 50/60 Hz	51033761
Herasafe 2030i, NSFCTS Series, 4 ft.	Cross Beam UV-C; Factory Acceptance Testing Documentation; Indented Single-Piece Work Tray; Prep for 3x Service Taps (Rear Wall)	120 V, 60 Hz	51033762
Herasafe 2030i, NSFCTS Series, 6 ft.	Cross Beam UV-C; Factory Acceptance Testing Documentation; Indented Single-Piece Work Tray; Prep for 3x Service Taps (Rear Wall)	120 V, 60 Hz	51033763

* Complete validation packages are only available in selected locations including the United States, Germany, France, the United Kingdom, Ireland, Spain, Portugal, Italy, Austria, Switzerland, Norway, Sweden, Denmark, and the Netherlands. For more information, contact your local representative.

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