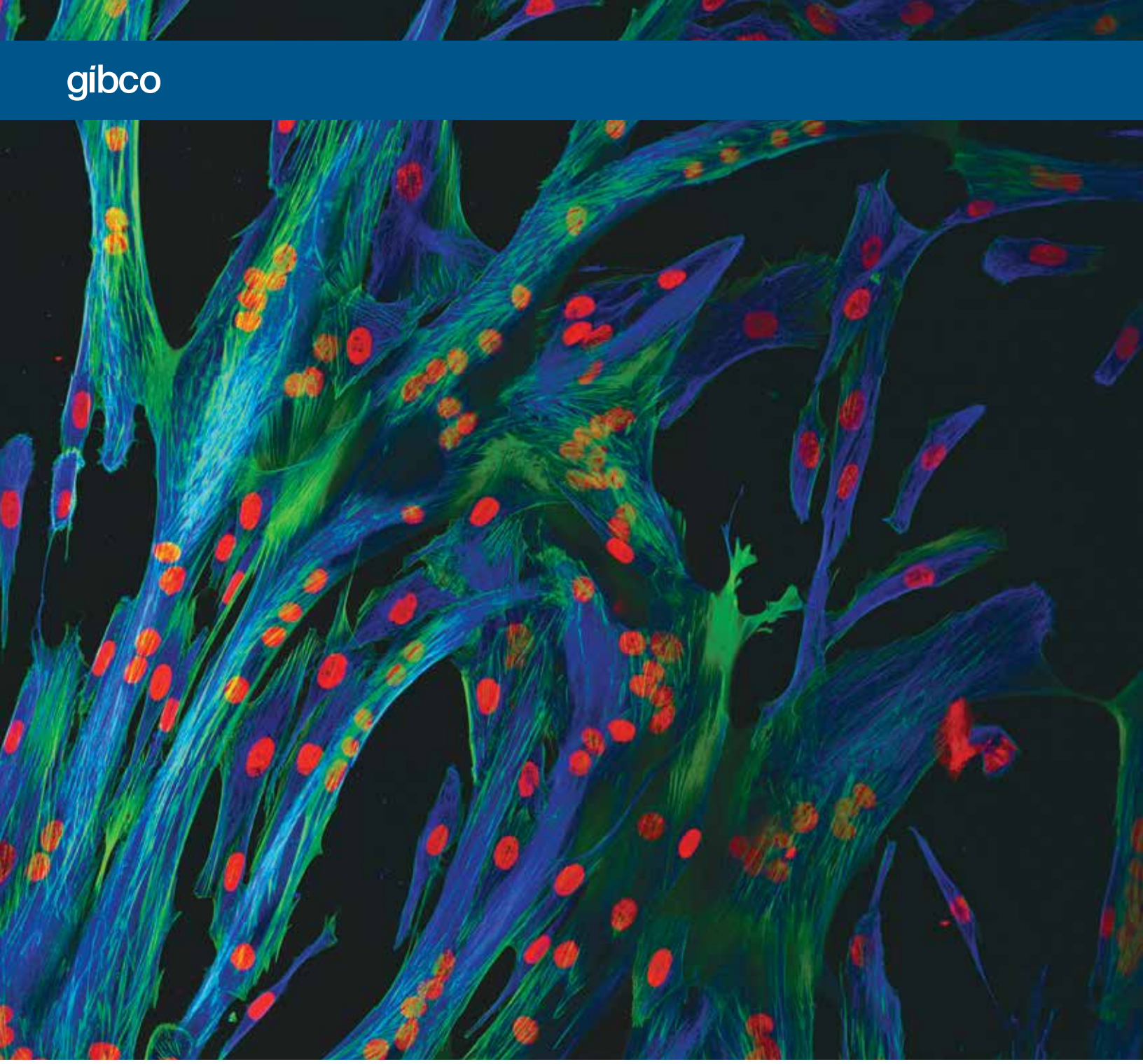
gibco



Human primary cell culture sourcebook

ThermoFisher SCIENTIFIC

Achieve more predictive results

Human primary cells closely mimic the *in vivo* state. Thus they have the potential to generate more physiologically relevant data. Our portfolio of Gibco™ primary cells, combined with high-quality primary cell culture media and matrices, helps reduce culture variability and enhance cell performance, enabling you to achieve more predictive results. For a complete review of our primary cell technologies and services, go to **thermofisher.com/primarycells**

Research applications for primary cells			
Basic structure/function studies	**Cancer biology**	**Drug discovery/cosmetics/ beauty and personal hygiene studies**	***In vitro* alternatives to animal testing**
Dermal modeling (wound healing and burn therapy)	Angiogenesis	HTS/HCA screening	Corrosivity
Gene regulation	Melanoma	Pigmentation	Cosmetics and topicals
Signal transduction	Normal controls	Secondary and tertiary screens	Household products irritancy
Cell co-culturing	3D culture	Toxicology screening	Safety assessment testing services and products
Primary cells and media for iPSC generation		Cosmetic (wrinkles, scars, hair growth)	

Our cells are ethically sourced

We work with a variety of human tissue sources, including tissue and organ procurement organizations, qualified research tissue organizations, and prominent academic and medical centers through collaborations that follow rigorous regulations, certifications, and/or accreditations. Tissues obtained through these source facilities are consistent with the legal and ethical practices of the United States and the European Union. As such, we follow these regulations and meet or exceed these standards. Specifically, we assure that all consents for the use of human cells derived from these tissues have been obtained from the next of kin.

Cover image: Human skeletal myoblasts stained with multiple Invitrogen™ dyes.

Contents

Serum-free media and applications

High-quality Gibco™ media and reagents eliminate the introduction of adventitious agents into your culture, reduce variability, and enhance performance. Gibco™ chemically defined media contain no proteins, hydrolysates, or components of unknown composition. These media are animal origin–free, and all components have a known chemical structure. Gibco™ serum-free media do not require supplementation with serum, but may contain discrete proteins or bulk protein fractions.

The use of serum-free media (SFM) represents an important tool that allows cell culture to be done with a defined set of conditions as free as possible of confounding variables.

Advantages of using serum-free media are:

- Increased definition
- More consistent performance
- Easier purification and downstream processing
- Precise evaluations of cellular function
- Increased growth and/or productivity
- Better control over physiological responsiveness
- Enhanced detection of cellular mediators

Certain applications may require the addition of growth factors and/or cytokines.

Note: Customized cell culture media are available. Submit your requests to our Custom Products Services group for timely evaluation and production of the formulation and delivery system that best fits your needs. See page 32 for more information.

Web resources

Primary cells	**thermofisher.com/primarycells**
Stem cells	**thermofisher.com/stemcells**
3D matrices and scaffolds	**thermofisher.com/3D-cellculture**
Transfection	**thermofisher.com/transfection**
Growth factors	**thermofisher.com/proteins**
Cell culture reagents	**thermofisher.com/gibco**

Ordering and technical support

For your convenience, you may place your order by the method that is best for you: order online, or by mail, email, phone, or fax. Our efficient customer service representatives will process your order quickly and accurately.

Order online

Place your order online 24 hours a day, 7 days a week, at **thermofisher.com**

Here you will find:

- Ability to save “Favorites” for easy future ordering
- Up-to-date access to order status and history
- Simple price checking for any catalog item using your ship-to number
- Rapid checkout with Quick Order

Order by mail, email, phone, or fax

To place an order by mail, email, phone, or fax, please go to **thermofisher.com/contactus** to obtain contact information for your location. When you order, please include the following information:

1. Institution or company customer number
2. Billing address
3. Shipping address
4. Valid purchase order number
5. Name of purchasing agent and department
6. Name and phone number of end user
7. Catalog number and description of product
8. Quantity and size of product

Technical support

In the US, call us at **800-955-6288** or email us at **techsupport@thermofisher.com**

In Europe, email us at **eurotech@thermofisher.com** or go to **thermofisher.com** to find regional contact information.

Human primary cell systems quick reference guide

Anatomical location of derivation	Cells	Acronym	Cryopreserved product Cat. No.
Skin	Human Epidermal Keratinocytes, neonatal (animal origin–free)	HEKn-AOF	C-020-5C
	Human Epidermal Keratinocytes, adult (animal origin–free)	HEKa-AOF	C-021-5C
	Human Epidermal Keratinocytes, neonatal	HEKn	C-001-5C
	Human Epidermal Keratinocytes, adult	HEKa	C-005-5C
	Human Epidermal Keratinocytes, pooled	HEKp	A13401
	Human Melanocytes, neonatal, lightly pigmented	HEMn-LP	C-002-5C
	Human Melanocytes, neonatal, moderately pigmented	HEMn-MP	C-102-5C
	Human Melanocytes, neonatal, darkly pigmented	HEMn-DP	C-202-5C
	Human Melanocytes, adult, lightly pigmented	HEMa-LP	C-024-5C
	Human Dermal Fibroblasts, neonatal	HDFn	C-004-5C
	Human Dermal Fibroblasts, adult	HDFa	C-013-5C
	Human Microvascular Endothelial Cells, neonatal dermis	HMVECnd	C-010-5C
	Human Microvascular Endothelial Cells, adult dermis	HMVECad	C-011-5C
Heart	Human Aortic Endothelial Cells	HAEC	C-006-5C
	Human Pulmonary Artery Endothelial Cells	HPAEC	C-008-5C
	Human Aortic Smooth Muscle Cells	HASMC	C-007-5C
	Human Coronary Artery Smooth Muscle Cells	HCASMC	C-017-5C
	Human Pulmonary Artery Smooth Muscle Cells	HPASMC	C-009-5C
Cornea	Human Corneal Epithelial Cells	HCEC	C-018-5C
Quadriceps	Human Skeletal Myoblasts, small size	HSkM	A12555
	Human Skeletal Myoblasts, large size		A11440
Umbilical cord	Human Umbilical Vein Endothelial Cells	HUVEC	C-003-5C
	Human Umbilical Vein Endothelial Cells (pooled, 500,000 cells)	HUVEC, pooled	C-015-5C
	Human Umbilical Vein Endothelial Cells (pooled, 1 million cells)	HUVEC, pooled	C-015-10C
Breast	Human Mammary Epithelial Cells	HMEC	A10565
Brain	Human Astrocytes††	NA	N7805-100
	Human Astrocyte Kit††		N7805-200

Growth medium	Cat. No.	Growth supplement	Acronym	Cat. No.
EpiLife* Medium	MEPI500CA	Supplement S7[†§]	S7[†§]	S-017-5
EpiLife* Medium	MEPI500CA	EpiLife Defined Growth Supplement[†]	EDGS[†]	S-012-5
		Human Keratinocyte Growth Supplement	HKGS	S-001-5
		Human Keratinocyte Growth Supplement Kit	HKGS Kit	S-001-K
Medium 154*	M-154-500	Human Keratinocyte Growth Supplement	HKGS	S-001-5
		Human Keratinocyte Growth Supplement Kit	HKGS Kit	S-001-K
Medium 254[‡]	M-254-500	Human Melanocyte Growth Supplement	HMGS	S-002-5
Medium 254[‡]	M-254-500	Human Melanocyte Growth Supplement-2	HMGS-2	S-016-5
Medium 106	M-106-500	Low Serum Growth Supplement	LSGS	S-003-10
		Low Serum Growth Supplement Kit	LSGS Kit	S-003-K
Medium 131 (w/ Attachment Factor)	M-131-500	Microvascular Growth Supplement	MVGS	S-005-25
Medium 200**	M-200-500	Large Vessel Endothelial Supplement	LVES	A1460801
Medium 231	M-231-500	Smooth Muscle Growth Supplement	SMGS	S-007-25
		Smooth Muscle Differentiation Supplement	SMDS	S-008-5
KSFM	17005-042	Note: Supplements included with media		
dKSFM[†]	10744-019			
DMEM, Low Glucose, Pyruvate[‡‡]	11885-084	2% Horse Serum (*In Vitro* Diagnostic Use)	2% Horse Serum	16050-130
Medium 200**	M-200-500	Large Vessel Endothelial Supplement	LVES	A1460801
Medium 171	M-171-500	Mammary Epithelial Growth Supplement	MEGS	S-015-5
HuMEC Ready Medium	12752-010	Note: Supplements included with media		
HuMEC Basal Serum-Free Medium	12753-018	HuMEC Supplement Kit	NA	12755013
Astrocyte Medium	A12613-01	NA		
		Note: Included in kit		

(continued on next page)

Human primary cell systems quick reference guide (continued)

Anatomical location of derivation	Cells	Cryopreserved product Cat. No.
Liver	HEP10, Pooled Human Cryopreserved Hepatocytes	HMCS10
	Human Suspension Hepatocytes, Metabolism Qualified, Male	HMCS1S
	Human Suspension Hepatocytes, Metabolism Qualified, Female	HMCS2S
	Human Suspension Hepatocytes, Metabolism Qualified, Male, 9–12 million	HMCS1L
	Human Suspension Hepatocytes, Metabolism Qualified, Female, 9–12 million	HMCS2L
	Human Suspension Hepatocytes, Polymorphic Donors	HMCSPS
	Human Suspension Hepatocytes, Polymorphic Donors, 9–12 million	HMCSPL
	Human Suspension Hepatocytes, Transporter Qualified	HMCSTS
	Human Suspension Hepatocytes, Transporter Qualified, 9–12 million	HMCSTL
	Human Plateable Hepatocytes, Induction Qualified	HMCPIS
	Human Plateable Hepatocytes, Metabolism Qualified	HMCPMS
	Human Plateable Hepatocytes, Transporter Qualified	HMCPTS
	Human Plateable Hepatocytes, Uptake Qualified	HMCPUS

* Also available in Calcium-Free and Calcium-Free/Phenol Red–Free Kits: EpiLife™ CF (Cat. No. M-EPICF-500) and CF/PRF (Cat. No. M-EPICFPRF-500), Medium 154CF (Cat. No. M-154CF-500) and CF/PRF Kits (Cat. No. M-154CFPRF-500).

† Requires plating with Coating Matrix Kit (Cat. No. R-011-K) for efficient cell attachment.

‡ Also available as Calcium-Free Kit: Medium 254CF Kit (Cat. No. M-254CF-500).

§ Animal product–free supplements.

** Also available as Phenol Red–Free: Medium 200PRF (Cat. No. M-200PRF-500).

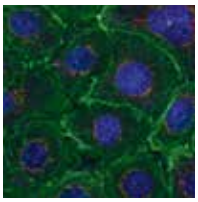
†† Requires plating with Geltrex™ matrix for efficient cell attachment.

‡‡ For human *ex vivo* tissue and cell culture processing applications. CAUTION: When used as a medical device, Federal law restricts this device to sale by or on the order of a physician.

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

Thawing reagents	Cat. No.	Plating reagents	Cat. No.	Maintenance reagents	Cat. No.
Cryopreserved Hepatocyte Recovery Medium (CHRM)	CM7000	Williams' E Medium (1X, no phenol red)	A12176-01	Williams' E Medium (1X, no phenol red)	A12176-01
		Hepatocyte Plating Supplement Pack (serum-containing)	CM3000	Hepatocyte Maintenance Supplement Pack (serum-free)	CM4000
		Collagen I, Coated Plates (6-well) or	A11428-01	Collagen I, Coated Plates (6-well) or	A11428-01
		Collagen I, Coated Plates (24-well) or	A11428-02	Collagen I, Coated Plates (24-well) or	A11428-02
		Collagen I, Coated Plates (96-well) plus	A11428-03	Collagen I, Coated Plates (96-well) plus	A11428-03
		Geltrex LDEV-Free Reduced Growth Factor Basement Membrane Matrix	A14132-02	Geltrex LDEV-Free Reduced Growth Factor Basement Membrane Matrix	A14132-02

Keratinocytes



We offer a wide array of Gibco™ products for keratinocyte culture, including products that are free of any animal-derived components such as bovine pituitary extract (BPE), serum, or any other components that are typically purified from animal sources. We refer to these products as being animal origin–free and use the abbreviation AOF to identify them. Gibco™ animal origin–free products do not contain material directly derived from animal tissues, cells, or body fluids of higher eukaryotic organisms, such as mammals (including humans), fish, birds, insects, etc. The term "animal origin" does not refer to other eukaryotic organisms such as the higher plants, fungi, protozoa, and algae, nor does it include prokaryotic organisms such as bacteria or blue-green algae. We offer complete cell culture systems designed and optimized to work together for the study of keratinocytes.

Characterization of human epidermal keratinocytes

Each lot of human epidermal keratinocyte (HEK) cells is performance-tested in our laboratory for viability and growth potential. The cells are also tested for potential biological contaminants (HIV-1, hepatitis B and hepatitis C viruses, mycoplasmas, bacteria, yeasts, and other fungi). To be approved for distribution, cells must be at least 70% viable upon thawing, each vial must contain at least 500,000 viable cells, and no potential biological contaminants can be detected. In addition, neonatal cells must be able to grow through at least 30 population doublings when cultured in Gibco™ EpiLife™ Medium supplemented with HKGS (for HEKn) or Supplement S7 (for HEKn-AOF). Adult cells must be able to grow through at least 25 population doublings when cultured in EpiLife Medium supplemented with HKGS (for HEKa) or Supplement S7 (for HEKa-AOF). Certificates of Analysis are available on our website, or by request.

Cell culture conditions	Suggested products
In an animal origin–free, chemically defined environment for an extended lifespan	Cells—HEKn-AOF or HEKa-AOF Basal medium—EpiLife Medium Growth supplement—Supplement S7 Reagents—recombinant trypsin/EDTA, defined trypsin inhibitor, gentamicin/amphotericin, Gibco™ Synth-a-Freeze™ Cryopreservation Medium, Coating Matrix Kit
In a chemically defined environment for an extended lifespan	Cells—HEKn or HEKa Basal medium—EpiLife Medium Growth supplement—EDGS Reagents—trypsin/EDTA, defined trypsin inhibitor, gentamicin/amphotericin, Synth-a-Freeze Cryopreservation Medium
In a BPE-containing environment for an extended lifespan	Cells—HEKn or HEKa Basal medium—EpiLife Medium Growth supplement—HKGS Reagents—trypsin/EDTA, trypsin neutralizer, gentamicin/amphotericin, Synth-a-Freeze Cryopreservation Medium
In a BPE-containing environment for a standard lifespan	Cells—HEKn or HEKa Basal medium—Medium 154 Growth supplement—HKGS Reagents—trypsin/EDTA, trypsin neutralizer, gentamicin/amphotericin, Synth-a-Freeze Cryopreservation Medium

Cells

Human epidermal keratinocytes (HEK), neonatal cells

HEKn, cryopreserved

Normal human epidermal keratinocytes isolated from neonatal foreskin, cryopreserved at the end of the primary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-001-5C

HEKn-AOF, neonatal cells, cryopreserved

Normal human epidermal keratinocytes from neonatal foreskin are isolated, grown, and cryopreserved in an animal origin–free environment at the end of the primary culture. For optimal performance when culturing keratinocytes in an animal origin–free environment, we recommend coating the culture surfaces with our Coating Matrix Kit (Cat. No. R-011-K).

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-020-5C

HEKp, neonatal cells, cryopreserved

Normal human epidermal keratinocytes isolated and pooled from 4–6 neonatal foreskins and cryopreserved at the end of the primary culture stage in AOF medium containing 10% DMSO.

Quantity	Cat. No.
1 vial (>1,000,000 viable cells)	A13401

Human epidermal keratinocytes (HEK), adult cells

HEKa, cryopreserved

Normal human epidermal keratinocytes, isolated from adult skin, cryopreserved at the end of the primary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-005-5C

HEKa-AOF, adult cells, cryopreserved

Normal human epidermal keratinocytes from adult skin are isolated, grown, and cryopreserved in an animal origin–free environment. They are cryopreserved at the end of the primary culture. For optimal performance when culturing keratinocytes in an animal origin–free environment, we recommend coating the culture surfaces with our Coating Matrix Kit (Cat. No. R-011-K).

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-021-5C

Basal media for keratinocytes

EpiLife Medium is designed to extend the lifespan of keratinocytes. If the desired end point is differentiation, Medium 154 may provide better results. Media do not contain antibiotics or antimycotics.

EpiLife Medium

Get the most from your cells using EpiLife serum-free, chemically defined, animal origin–free cell culture medium. EpiLife Medium can help extend the *in vitro* lifespan of primary cells in culture up to twice as long compared to other serum-free formulations. EpiLife Medium contains 60 µM calcium chloride and is convenient and easy to use with single-shot supplementation. It is ideal for supporting the isolation, growth, and survival of both normal human keratinocytes and other types of epithelial cells when combined with appropriate supplements.

Quantity	Cat. No.
500 mL	M-EPI-500-CA

EpiLife CF (calcium-free) Medium

A sterile liquid medium, EpiLife CF Medium is prepared without calcium chloride† for the long-term, serum-free culture of human epidermal keratinocytes. This basal medium requires the addition of calcium plus an appropriate growth supplement prior to use. Calcium chloride is provided as a separate component with each bottle of medium.

Quantity	Cat. No.
500 mL	M-EPICF-500

EpiLife CF/PRF (calcium-free, phenol red–free) Medium

A sterile, liquid medium for the long-term, serum-free culture of human epidermal keratinocytes, EpiLife CF/PRF Medium is prepared without calcium chloride† or phenol red. This basal medium requires the addition of calcium plus an appropriate growth supplement prior to use. Calcium chloride is provided as a separate component with each bottle of medium.

Quantity	Cat. No.
500 mL	M-EPICFPRF-500

† Calcium concentration from other sources is 0.65 µM in unsupplemented EpiLife CF and CF/PRF media.

Medium 154

A sterile, liquid medium for the serum-free culture of human epidermal keratinocytes. This basal medium requires the addition of HKGS (Cat. No. S-001-5) or HKGS Kit (Cat. No. S-001-K) prior to use. Contains 200 µM calcium chloride.

Quantity	Cat. No.
500 mL	M-154-500

Medium 154CF (calcium-free)

A sterile, liquid medium for the serum-free culture of human epidermal keratinocytes. Medium 154CF is Medium 154 prepared without calcium chloride.‡ This basal medium requires the addition of calcium plus HKGS (Cat. No. S-001-5) or HKGS Kit (Cat. No. S-001-K) prior to use. Calcium chloride is provided as a separate component with each bottle of medium.

Quantity	Cat. No.
500 mL	M-154CF-500

Medium 154CF/PRF (calcium-free, phenol red–free)

A sterile, liquid medium for the serum-free culture of human epidermal keratinocytes. Medium 154CF/PRF is Medium 154 prepared without calcium chloride‡ or phenol red. This basal medium requires the addition of calcium plus HKGS (Cat. No. S-001-5) or HKGS Kit (Cat. No. S-001-K) prior to use. Calcium chloride is provided as a separate component with each bottle of medium.

Quantity	Cat. No.
500 mL	M-154CF-500

‡ Calcium concentration from other sources is 0.5 µM in unsupplemented Medium 154CF and Medium 154CF/PRF.

Growth supplements for keratinocytes

Only supplements in kit form contain antibiotics and antimycotics.

Human Keratinocyte Growth Supplement (HKGS)

A sterile, concentrated (100X) solution intended for use with EpiLife Medium or Medium 154 to culture human epidermal keratinocytes. Contains bovine pituitary extract (BPE),† human epidermal growth factor, hydrocortisone, recombinant human insulin-like growth factor-1 (IGF-1), and transferrin.

Quantity	Cat. No.
5 mL	S-001-5

† BPE from New Zealand sources only.

Human Keratinocyte Growth Supplement (HKGS) Kit

A sterile set of solutions intended for use with EpiLife Medium or Medium 154 to culture human epidermal keratinocytes. The HKGS Kit provides, in separate vials, all the components of complete HKGS: bovine pituitary extract (BPE),* human epidermal growth factor, hydrocortisone, recombinant human insulin-like growth factor-1 (IGF-1), and transferrin. A vial of gentamicin/amphotericin B solution (GA) is also included. Use of GA is optional.

Quantity	Cat. No.
1 kit	S-001-K

* BPE from New Zealand sources only.

Supplement S7

A chemically defined, sterile, animal origin–free, concentrated (100X), ionically balanced solution intended for use with EpiLife Medium to culture human epidermal keratinocytes (not intended for use with Medium 154). Each 5 mL bottle of Supplement S7 is the correct amount of supplement for a 500 mL bottle of Gibco™ EpiLife™ Basal Medium. For optimal performance, we recommend using S7 in conjunction with our Coating Matrix Kit (Cat. No. R-011-K).

Quantity	Cat. No.
5 mL	S-017-5

EpiLife Defined Growth Supplement (EDGS)

A defined, sterile, concentrated (100X) solution intended for use with EpiLife Medium to culture human epidermal keratinocytes (not intended for use with Medium 154). This solution contains BSA, bovine transferrin, rhIGF-1, rhEGF, hydrocortisone, and PGE-2 (synthetic). For optimal performance, we recommend using EDGS in conjunction with our Coating Matrix Kit (Cat. No. R-011-K).

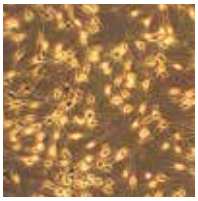
Quantity	Cat. No.
5 mL	S-012-5

Keratinocyte AOF Growth Kit

The Keratinocyte AOF Growth Kit is for the animal origin–free culture of human keratinocytes. The kit contains EpiLife Basal Medium, Supplement S7, and the Coating Matrix Kit.

Quantity	Cat. No.
1 kit	A1051501

Melanocytes



Characterization of human epidermal melanocytes

We offer three varieties of human epidermal melanocytes, defined by the degree of pigmentation of the cells in the preparation: light (LP), medium (MP), and dark (DP). Each lot of human epidermal melanocyte (HEM) cells is performance-tested in our laboratory for viability and growth potential. The cells are also tested for potential biological contaminants (HIV-1, hepatitis B and hepatitis C viruses, mycoplasmas, bacteria, yeasts, and other fungi). To be approved for distribution, cells must be at least 70% viable upon thawing, each vial must contain at least 500,000 viable cells, and no potential biological contaminants can be detected. HEMn-MP and HEMn-DP cells must be able to grow through at least 12 population doublings; HEMn-LP and HEMa-LP cells must be able to grow through at least 16 population doublings. HEMa-LP cells stain positively with Mel-5 antibody in the fourth culture after thawing. Certificates of Analysis are available on our website, or by request.

Cells

Human epidermal melanocytes (HEM), neonatal cells

HEMn-LP, cryopreserved

Normal human epidermal melanocytes isolated from lightly pigmented neonatal foreskin, cryopreserved at the end of the secondary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-002-5C

HEMn-MP, cryopreserved

Normal human epidermal melanocytes isolated from moderately pigmented neonatal foreskin, cryopreserved at the end of the secondary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-102-5C

HEMn-DP, cryopreserved

Normal human epidermal melanocytes isolated from darkly pigmented neonatal foreskin, cryopreserved at the end of the secondary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-202-5C

Human epidermal melanocytes (HEM), adult cells

HEMa-LP, cryopreserved

Normal human epidermal melanocytes isolated from lightly pigmented adult skin, cryopreserved at the end of the secondary culture. For optimal performance when culturing adult melanocytes, we recommend using Human Melanocyte Growth Supplement-2 (Cat. No. S-016-5).

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-024-5C

Basal media for melanocytes

Media do not contain antibiotics or antimycotics.

Medium 254

A sterile, liquid medium optimized for the culture of human epidermal melanocytes. This basal medium requires the addition of HMGS (Cat. No. S-002-5) or HMGS-2 (Cat. No. S-016-5) prior to use.

Quantity	Cat. No.
500 mL	M-254-500

Medium 254CF (calcium-free)

A sterile, liquid medium for the culture of human epidermal melanocytes. Medium 254CF is Medium 254 prepared without calcium chloride.* Calcium chloride is provided as a separate component with each bottle of medium. This basal medium requires the addition of calcium plus HMGS (Cat. No. S-002-5) or HMGS-2 (Cat. No. S-016-5) prior to use.

Quantity	Cat. No.
500 mL	M-254CF-500

*Calcium concentration from other sources is 0.5 µM in unsupplemented Medium 254CF.

Growth supplements for melanocytes

Supplements do not contain antibiotics or antimycotics.

Human Melanocyte Growth Supplement (HMGS)

HMGS is a sterile, concentrated (100X) solution intended for use with Medium 254 or Medium 254CF to culture human epidermal melanocytes. The solution contains fetal bovine serum, basic fibroblast growth factor, bovine pituitary extract (BPE),† heparin, hydrocortisone, recombinant human insulin-like growth factor-1 (IGF-1), transferrin, and phorbol 12-myristate 13-acetate. It is recommended for either neonatal or adult melanocytes.

Quantity	Cat. No.
5 mL	S-002-5

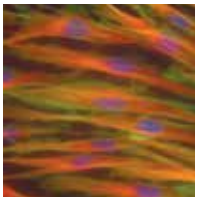
Human Melanocyte Growth Supplement-2 (HMGS-2)

HMGS-2 is a sterile, concentrated (100X) solution intended for use with Medium 254 or Medium 254CF to culture human epidermal melanocytes. The solution contains fetal bovine serum, basic fibroblast growth factor, bovine pituitary extract (BPE),† heparin, hydrocortisone, recombinant human insulin-like growth factor-1 (IGF-1), transferrin, and endothelin-1. It is recommended for HEMa-LP cells.

Quantity	Cat. No.
5 mL	S-016-5

† BPE from New Zealand and/or Australian sources only.

Fibroblasts



Characterization of human dermal fibroblasts

Each lot of human dermal fibroblast (HDF) cells is performance-tested in our laboratory for viability and growth potential. The cells are also tested for potential biological contaminants (HIV-1, hepatitis B and hepatitis C viruses, mycoplasmas, bacteria, yeasts, and other fungi). To be approved for distribution, cells must be at least 70% viable upon thawing, each vial must contain at least 500,000 viable cells, HDFa cells must be able to grow through at least 12 population doublings, and HDFn cells must be able to grow through at least 16 population doublings; no potential biological contaminants can be detected. Certificates of Analysis are available on our website, or by request.

Cells

Human dermal fibroblasts (HDF), neonatal cells HDFn, cryopreserved

Normal human dermal fibroblasts isolated from neonatal foreskin, cryopreserved at the end of the primary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-004-5C

Human dermal fibroblasts (HDF), adult cells HDFa, cryopreserved

Normal human dermal fibroblasts isolated from adult skin, cryopreserved at the end of the primary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-013-5C

Basal medium for fibroblasts

Medium does not contain antibiotics or antimycotics.

Medium 106

A sterile liquid medium for the culture of human dermal fibroblasts. This basal medium requires the addition of LSGS (Cat. No. S-003-10) or LSGS Kit (Cat. No. S-003-K) prior to use.

Quantity	Cat. No.
500 mL	M-106-500

Growth supplements for fibroblasts

Only supplements in kit form contain antibiotics or antimycotics.

Low Serum Growth Supplement (LSGS)

A sterile, concentrated (50X) solution intended for use with Medium 106 (for fibroblasts) or Medium 200 (for endothelial cells). Optimized for dermal fibroblast culture when paired with Medium 106, LSGS contains fetal bovine serum, basic fibroblast growth factor, heparin, hydrocortisone, and epidermal growth factor.

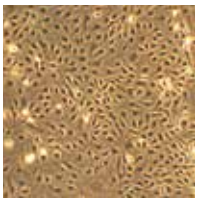
Quantity	Cat. No.
10 mL	S-003-10

Low Serum Growth Supplement (LSGS) Kit

The LSGS Kit provides, in separate vials, all the components of complete LSGS: fetal bovine serum, hydrocortisone, human epidermal growth factor, and basic fibroblast growth factor/heparin (stabilized with BSA). A vial of gentamicin/amphotericin B solution (GA) is also included. Use of GA is optional.

Quantity	Cat. No.
1 kit	S-003-K

Microvascular endothelial cells



Characterization of human microvascular endothelial cells

Each lot of human microvascular endothelial cells (HMVEC) is performance-tested in our laboratory for viability, growth potential, and for differentiation markers. The cells are also tested for potential biological contaminants (HIV-1, hepatitis B and hepatitis C viruses, mycoplasmas, bacteria, yeasts, and other fungi). To be approved for distribution, the cells must be at least 70% viable upon thawing, each vial must contain at least 500,000 viable cells, cells must be able to grow through at least 16 population doublings, and no potential biological contaminants can be detected. In addition, during the first culture after thawing, the cells must take up acetylated LDL and express von Willebrand factor (vWF), CD31, and CD36 (endothelial cell markers), but not α-actin (a smooth muscle cell marker). Certificates of Analysis are available on our website, or by request.

Cells

Human microvascular endothelial cells (HMVEC), neonatal HMVECnd, cryopreserved

Normal human microvascular endothelial cells isolated from neonatal dermis, cryopreserved at the end of the tertiary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-010-5C

Human microvascular endothelial cells (HMVEC), adult HVECad, cryopreserved

Normal human microvascular endothelial cells isolated from adult dermis, cryopreserved at the end of the tertiary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-011-5C

Basal medium for microvascular endothelial cells

Medium does not contain antibiotics or antimycotics.

Medium 131 Plus Attachment Factor

A sterile liquid medium for the culture of human microvascular endothelial cells. This basal medium requires the addition of MVGS (Cat. No. S-005-25) prior to use. It includes one bottle (100 mL) of Attachment Factor (Cat. No. S-006-100).

Quantity	Cat. No.
500 mL	M-131-500

Growth supplements for microvascular endothelial cells

Supplements do not contain antibiotics or antimycotics.

Microvascular Growth Supplement (MVGS)

A sterile, concentrated (20X) solution intended for use with Medium 131 to culture human microvascular endothelial cells. The solution contains fetal bovine serum, basic fibroblast growth factor, epidermal growth factor, heparin, hydrocortisone, and dbcAMP.

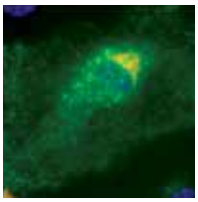
Quantity	Cat. No.
25 mL	S-005-25

Attachment Factor (AF)

A sterile solution (1X) containing gelatin as an attachment factor. When used to coat culture surfaces, AF enhances the growth of microvascular endothelial cells.

Quantity	Cat. No.
100 mL	S-006-100

Large vessel endothelial cells



Characterization of human large vessel endothelial cells

Each lot of cells is performance-tested in our laboratory for viability, growth potential, and differentiation markers. The cells are also tested for potential biological contaminants (HIV-1, hepatitis B and hepatitis C viruses, mycoplasmas, bacteria, yeasts, and other fungi). To be approved for distribution, the cells must be at least 70% viable upon thawing, each vial must contain at least the indicated number of viable cells, the cells must be able to grow through at least 16 population doublings, and no potential biological contaminants can be detected. In addition, during the first culture after thawing, the cells must take up acetylated LDL and express von Willebrand factor (vWF) and CD31 (endothelial cell markers), but not α-actin (a smooth muscle cell marker). Certificates of Analysis are available on our website, or by request.

Cells

Human large vessel endothelial cells

HAEC, cryopreserved

Normal human aortic endothelial cells, cryopreserved at the end of the tertiary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-006-5C

HPAEC, cryopreserved

Normal human pulmonary artery endothelial cells, cryopreserved at the end of the tertiary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-008-5C

HUVEC, cryopreserved

Normal human umbilical vein endothelial cells, cryopreserved at the end of the primary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-003-5C

HUVECp, cryopreserved

Normal human umbilical vein endothelial cells pooled from multiple donors, cryopreserved at the end of the primary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-015-5C
1 vial (>1,000,000 viable cells)	C-015-10C

Basal media for large vessel endothelial cells

Media do not contain antibiotics or antimycotics.

Medium 200

A sterile liquid medium for the culture of human large vessel endothelial cells. This basal medium requires the addition of LSGS (Cat. No. S-003-10) or LSGS Kit (Cat. No. S-003-K) prior to use.

Quantity	Cat. No.
500 mL	M-200-500

Medium 200PRF (phenol red–free)

A sterile, liquid medium for the culture of human large vessel endothelial cells. Medium 200PRF is Medium 200 prepared without phenol red. This basal medium requires the addition of LVES (Cat. No. A1460801) prior to use.

Quantity	Cat. No.
500 mL	M-200PRF-500

Growth supplements for large vessel endothelial cells

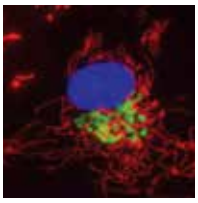
Supplements do not contain antibiotics or antimycotics.

Large Vessel Endothelial Supplement (LVES)

A sterile, concentrated (50X) solution intended for use with Medium 200 or Medium 200PRF for optimal culture of human large vessel endothelial cells. Contains fetal bovine serum, basic fibroblast growth factor, heparin, hydrocortisone, epidermal growth factor, and ascorbic acid.

Quantity	Cat. No.
11 mL	A1460801

Smooth muscle cells



Characterization of human smooth muscle cells

Each lot of cells is performance-tested in our laboratory for viability, growth potential, and differentiation markers. The cells are also tested for potential biological contaminants (HIV-1, hepatitis B and hepatitis C viruses, mycoplasmas, bacteria, yeasts, and other fungi). To be approved for distribution, cells must be at least 70% viable upon thawing, each vial must contain at least 500,000 viable cells, the cells must be able to grow through at least 16 population doublings, and no potential biological contaminants can be detected. In addition, when cultured in differentiation medium, cells must express α-actin (a smooth muscle cell marker), but not von Willebrand factor (vWF, an endothelial cell marker). Certificates of Analysis are available on our website, or by request.

Cells

Human smooth muscle cells HASMC, cryopreserved

Normal human aortic smooth muscle cells, cryopreserved at the end of the tertiary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-007-5C

HCASMC, cryopreserved

Normal human coronary artery smooth muscle cells, cryopreserved at the end of the tertiary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-017-5C

HPASMC, cryopreserved

Normal human pulmonary artery smooth muscle cells, cryopreserved at the end of the tertiary culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-009-5C

Basal medium for smooth muscle cells

Medium does not contain antibiotics or antimycotics.

Medium 231

A sterile, liquid medium for the culture of human smooth muscle cells. For growth of human smooth muscle cells, the medium requires the addition of SMGS (Cat. No. S-007-25) prior to use. For differentiation of human smooth muscle cells, the medium requires the addition of SMDS (Cat. No. S-008-5) prior to use.

Quantity	Cat. No.
500 mL	M-231-500

Growth and differentiation supplements for smooth muscle cells

Supplements do not contain antibiotics or antimycotics.

Smooth Muscle Cell Growth Supplement (SMGS)

A sterile, concentrated (20X) solution intended for use with Medium 231 to culture human smooth muscle cells. The solution contains fetal bovine serum, basic fibroblast growth factor, epidermal growth factor, heparin, recombinant human insulin-like growth factor-1 (IGF-1), and BSA.

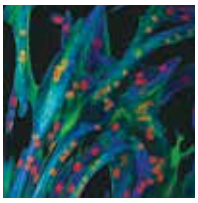
Quantity	Cat. No.
25 mL	S-007-25

Smooth Muscle Cell Differentiation Supplement (SMDS)

A sterile, concentrated (100X) solution intended for use with Medium 231 to enhance differentiation of human smooth muscle cells. The solution contains fetal bovine serum and heparin.

Quantity	Cat. No.
5 mL	S-008-5

Skeletal myoblasts



Characterization of human skeletal myoblast cells

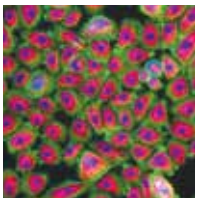
Each lot is designed to undergo highly efficient differentiation directly following plating of cryopreserved cells. Each vial contains cells that have been cryopreserved in a medium containing 10% DMSO and will differentiate and form myotubes within 48 hours after plating. These cells do not require expansion prior to differentiation. Cell viability is >70% post-thaw with a ≥50% myogenic index after 48 hours. Each vial of human skeletal myoblast cells (HSkMs) contains a sufficient number of cells to fully seed ¼ of a single multi-well dish (ranging in format from 6-well to 384-well). Cells are thawed and plated in DMEM supplemented with 2% horse serum. Certificates of Analysis are available on our website, or by request.

Human skeletal myoblast cells HSkM, cryopreserved
Normal human skeletal myoblast cells, cryopreserved at the end of the tertiary culture.

Quantity	Cat. No.
1 vial (1 x 10^6 cells)	A12555
1 vial (5 x 10^6 cells)	A11440

Corneal epithelial cells

Characterization of human corneal epithelial cells



Primary human corneal epithelial cells (HCECs) are prepared to provide ≥70% viability upon thawing, with each vial containing sufficient cells to seed ~100 cm^2 of tissue culture surface. Each lot of HCECs undergoes performance testing and is guaranteed to achieve at least 12 population doublings after thawing when using Keratinocyte Serum-Free Medium (KSFM). Gibco™ corneal cells stain positively in immunocytochemistry screens for the corneal epithelial markers cytokeratin 15 and p63 alpha. Certificates of Analysis are available on our website, or by request.

Cells

Human corneal epithelial cells (HCEC) HCEC, cryopreserved
Normal human corneal epithelial cells isolated from the progenitor-rich limbal region of the eye and cryopreserved at the end of the secondary culture level in a medium containing 10% DMSO.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	C-018-5C

Basal media for corneal epithelial cells

Media do not contain antibiotics or antimycotics

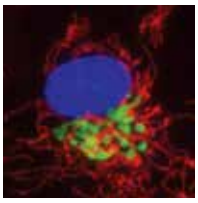
Keratinocyte-SFM
A sterile, serum-free liquid medium that supports the robust growth of human corneal epithelial cells, keratinocytes, and other types of epithelial cells. It contains L-glutamine and is supplied as a kit that includes aliquots of bovine pituitary extract (BPE) and recombinant epidermal growth factor (rEGF).

Quantity	Cat. No.
500 mL	17005-042

Defined Keratinocyte-SFM
Defined Keratinocyte-SFM is a sterile, defined liquid medium that supports the robust growth of human corneal epithelial cells, keratinocytes and other types of epithelial cells. Defined Keratinocyte-SFM is free of serum and bovine pituitary extract and is supplied as a kit that includes single aliquots of growth supplement–containing factors, including insulin, epidermal growth factor (EGF), and fibroblast growth factor (FGF) from bovine pituitary extract. For optimal performance, we recommend using Defined Keratinocyte-SFM in conjunction with our Coating Matrix Kit (Cat. No. R-011-K).

Quantity	Cat. No.
500 mL	10744-019

Mammary epithelial cells



Characterization of human mammary epithelial cells

Each lot of human mammary epithelial cells (HMEC) is performance-tested in our laboratory for viability, growth potential, and differentiation markers. The cells are also tested for potential biological contaminants (HIV-1, hepatitis B and hepatitis C viruses, mycoplasmas, bacteria, yeasts, and other fungi). To be approved for distribution, cells must be at least 70% viable upon thawing, each vial must contain at least 500,000 viable cells, the cells must be able to grow through at least 16 population doublings, and no potential biological contaminants can be detected. In addition, when cultured in complete HuMEC Medium, cells must test positive for cytokeratins 5/6, 8, 18, and E-cadherin. Certificates of Analysis are available on our website, or by request.

Cells

Human mammary epithelial cells (HMEC), cryopreserved

Normal human mammary epithelial cells, cryopreserved at the end of the 6th culture.

Quantity	Cat. No.
1 vial (>500,000 viable cells)	A10565

Medium for mammary epithelial cells

Medium does not contain antibiotics or antimycotics.

HuMEC Ready Medium

A sterile liquid medium for the culture of human mammary epithelial cells. Engineered specifically for culture of human mammary epithelial cells, HuMEC Medium is a serum-free formulation with frozen supplements containing growth factor and other components. This ready medium does not require additional supplementation.

Quantity	Cat. No.
500 mL	12752-010

Growth supplement for mammary epithelial cells

Supplements do not contain antibiotics or antimycotics.

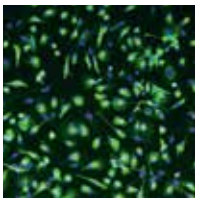
HuMEC Supplement Kit

HuMEC Medium supplemented with this kit promotes superior growth of normal human mammary epithelial cells. The HuMEC Supplement Kit includes 5 mL of a supplement mix containing epidermal growth factor, hydrocortisone, isoproterenol, transferrin, and insulin, and 25 mg of bovine pituitary extract (BPE).*

Quantity	Cat. No.
1 kit	12755013

*BPE from New Zealand and/or Australian sources only.

Hepatocytes



Characterization of human hepatocytes

Gibco™ hepatocytes have *in vivo*–like enzyme expression levels, and, if qualified as plateable cells, form confluent monolayers that contribute to polarization and functioning cell–cell contacts. Extensive lot selection options from a variety of donors are available. Many lots have >100 vials, are fully characterized for phase I and phase II drug metabolizing enzyme activities, and have viabilities routinely above 80%.

Cells

Cryopreserved hepatocytes, transporter qualified

Each of our transporter-qualified lots (suspension and plateable) have been functionally tested for the activities of the NTCP, OATP1B3, and OATP transporter pathways. They have also been tested for phase I and phase II metabolic activities. Short-term transporter–qualified lots are tested at a 24-hour time point. Long-term uptake–qualified lots are tested at a 120-hour (5-day) time point. The cells have stringent release specifications and are guaranteed to show ≥80% viability and ≥80% confluency (if cells are plated under appropriate conditions).

Product	Quantity	Cat. No.
Human Cryopreserved Plateable Hepatocytes, Transporter Qualified	4–8 million viable cells/vial	HMCPTS
Human Cryopreserved Plateable Hepatocytes, Uptake Qualified	4–8 million viable cells/vial	HMCPUS
Human Cryopreserved Suspension Hepatocytes, Transporter Qualified	4–8 million viable cells/vial	HMCSTS
Human Cryopreserved Suspension Hepatocytes, Transporter Qualified	9–12 million viable cells/vial	HMCSTL

Induction qualified

Our induction-qualified hepatocytes have passed our test for specific activity and mRNA levels in response to prototypical inducers.

Minimum specific activities:
- 10-fold induction of CYP1A2
- 5-fold induction of CYP2B6
- 3-fold induction of CYP3A4

The cells have stringent release specifications and are guaranteed to show ≥80% viability and ≥80% confluency (if appropriately plated).

Product	Quantity	Cat. No.
Human Cryopreserved Plateable Hepatocytes, Induction Qualified	4–8 million viable cells/vial	HMCPIS

Metabolism qualified

Our metabolism-qualified hepatocytes have been tested for enzymatic functions using intrinsic clearance (CL_{int}) or assays using known substrates for P450 activity. The disappearance of parent compound is monitored by LC/MS/MS and CL_{int} values determined by linear regression. Gibco™ HEP10™ Pooled Hepatocytes give a representative population of 10 or more different donors (male and female).

Cells	Characterization
Single donor, plated	CYP3A4, CYP2C9, CYP2D6
Single donor, suspension	CYP1A2, CYP2B6, CYP2C8, CYP2C9, CYP2C19, CYP2D6, CYP3A, ECOD, 7-HCG, and 7-HCS
HEP10 pooled, suspension	CYP1A2, CYP2B6, CYP2C8, CYP2C9, CYP2C19, CYP2D6, CYP2E1, CYP3A4, CYP3A4/5, FMO activity, and NTCP, OATP1B3, and OATP transporter pathways

The cells have stringent release specifications and are guaranteed to show ≥80% viability and ≥75% attachment efficiency (when plated).

Product	Quantity	Cat. No.
Human Cryopreserved Plateable Hepatocytes, Metabolism Qualified	4–8 million viable cells/vial	HMCPMS
Human Cryopreserved Suspension Hepatocytes, Metabolism Qualified, Male Donor	4–8 million viable cells/vial	HMCS1S

Product	Quantity	Cat. No.
Human Cryopreserved Plateable Hepatocytes, Metabolism Qualified, Male Donor	9–12 million viable cells/ vial	HMCS1L
Human Cryopreserved Suspension Hepatocytes, Metabolism Qualified, Female Donor	4–8 million viable cells/ vial	HMCS2S
Human Cryopreserved Plateable Hepatocytes, Metabolism Qualified, Female Donor	9–12 million viable cells/ vial	HMCS2L
HEP10 Pooled Cryopreserved Human Hepatocytes	4–8 million viable cells/ vial	HMCS10

Fresh hepatocytes

- Reliable supply from the industry's largest sourcing network
- Stringent release specs: ≥80% viability and ≥80% confluency (plated cells)
- Plated to your specifications or provided in suspension, and available with or without Gibco™ Geltrex™ overlay
- Available ONLY in North America, with multiple isolations weekly

Product	Quantity	Cat. No.
Human Fresh Hepatocytes, Suspension	15 million cells/vial	HMFS01
Human Fresh Hepatocytes, Plated	1 x 6-well plate	HMFN06
Human Fresh Hepatocytes, Plated	1 x 12-well plate	HMFN12
Human Fresh Hepatocytes, Plated	1 x 24-well plate	HMFN24
Human Fresh Hepatocytes, Plated	1 x 48-well plate	HMFN48
Human Fresh Hepatocytes, Plated	1 x 96-well plate	HMFN96
Human Fresh Hepatocytes with Geltrex Overlay	1 x 6-well plate	HMFY06
Human Fresh Hepatocytes with Geltrex Overlay	1 x 12-well plate	HMFY12
Human Fresh Hepatocytes with Geltrex Overlay	1 x 24-well plate	HMFY24
Human Fresh Hepatocytes with Geltrex Overlay	1 x 48-well plate	HMFY48
Human Fresh Hepatocytes with Geltrex Overlay	1 x 96-well plate	HMFY96

Basal media for hepatocytes

Cryopreserved Hepatocyte Recovery Medium (CHRM)

A proprietary formulation designed to enhance the recovery of viable hepatocytes while removing cryoprotectant after cell cryopreservation, yielding consistently higher viability.

Product	Quantity	Cat. No.
Cryopreserved Hepatocyte Recovery Medium (CHRM)	50 mL	CM7000

Cryopreserved Hepatocyte Plating Medium (CHPM)

Product	Quantity	Cat. No.
Cryopreserved Hepatocyte Plating Medium (CHPM)	50 mL	CM9000

Williams' E Medium

Product	Quantity	Cat. No.
Williams' E Medium (1X, no phenol red)	500 mL	A12176-01

Growth supplements for hepatocytes

Hepatocyte Plating Supplement Pack

Hepatocyte Plating Supplement Packs contain prequalified fetal bovine serum, dexamethasone, and a cocktail solution of penicillin-streptomycin, human recombinant insulin, Gibco™ GlutaMAX™ Supplement, and HEPES to supplement up to 500 mL of Williams' E Medium without phenol red, or a suitable alternative basal medium, for the purpose of plating fresh or cryopreserved hepatocytes.

Product	Quantity	Cat. No.
Hepatocyte Plating Supplement Pack (serum-containing)	1 kit for 500 mL medium	CM3000

Hepatocyte Maintenance Supplement Pack

Hepatocyte Maintenance Supplement Packs contain dexamethasone and a cocktail solution of penicillin-streptomycin, ITS+ (insulin, transferrin, selenium complex, BSA, and linoleic acid), GlutaMAX Supplement, and HEPES to supplement up to 500 mL of Williams' E Medium without phenol red, or a suitable alternative basal medium, for the purpose of incubating hepatocytes in suspension or plated cultures.

Product	Quantity	Cat. No.
Hepatocyte Maintenance Supplement Pack (serum-free)	1 kit for 500 mL medium	CM4000

Neural cell lines

Human Astrocytes

Human astrocytes are normal human cells derived from human brain tissue. When used together with Astrocyte Medium, Gibco™ Human Astrocytes are highly mature and differentiated GFAP-positive cells with the typical star-like morphology ideal for studies of fundamental human neurological pathways and human neurological diseases.

Quantity	Cat. No.
1 mL	N7805-100

Human dopaminergic precursor cells

These cells are derived from H9 human embryonic stem cells (hESCs) and produce 15–20% tyrosine hydroxylase (TH)-positive dopaminergic (DA) neurons after differentiation.

Human dopaminergic precursor cells are available only as custom products. Call us for information.

Human Neural Stem Cells (H9-derived)

These are consistently high-purity cells with normal human karyotypes that can differentiate into neurons, oligodendrocytes, and astrocytes. Consistent proliferation occurs in adherent cell culture when used with Gibco™ StemPro™ NSC SFM.

Quantity	Cat. No.
1 mL	N7800-100

We offer a complete portfolio of neuroscience research technologies. For more information about neural and primary stem cells, go to **thermofisher.com/neuralculture**

Stem cell lines

StemPro™ CD34+ Cell Kit

Our pooled human hematopoietic progenitor cells (HPCs) are derived from the umbilical cord blood of mixed donors. Along with cord blood–derived CD34+ cells, this kit includes StemPro™-34 SFM basal liquid medium and frozen StemPro™-34 Nutrient Supplement to facilitate the immediate culturing of the StemPro™ CD34+ cells.

Cat. No. A14059

StemPro™ Human Adipose-Derived Stem Cell (ADSC) Kit

This kit contains human ADSCs isolated from human lipoaspirate tissue and cryopreserved from primary cultures. The kit also contains MesenPRO RS™ Medium.

Cat. No. R7788110

StemPro™ Human Adipose-Derived Stem Cells

The same cells as the above kit, without the MesenPRO RS™ Medium.

Cat. No. R7788-115

The products listed in this section are inclusive of our preconfigured stem cell lines. We offer a vast array of stem cell–enabling research technologies. Go to **thermofisher.com/stemcells** for the complete capability details.

Validated primary cell culture reagents

For optimal performance when culturing the primary cells found in this sourcebook, we recommend using the reagents found in this section, which have been validated for these culture systems.

Trypsin/EDTA Solution (TE)

A sterile, phosphate buffered saline solution (1X) containing trypsin and EDTA for the subculture of attachment-dependent cells.

Quantity	Cat. No.
100 mL	R-001-100

Gentamicin/Amphotericin B Solution (GA), 10-Pack

A sterile, concentrated (500X) solution of gentamicin and amphotericin B (10 x 1 mL vials/pkg). One GA 10-Pack is enough to supplement ten 500 mL bottles of basal medium.

Quantity	Cat. No.
10 x 1 mL	R-015-10

Trypsin Neutralizer Solution (TN)

A sterile, phosphate-buffered saline solution (1X) containing calf serum as a trypsin inhibitor.

Quantity	Cat. No.
100 mL	R-002-100

Defined Trypsin Inhibitor (DTI)

A sterile, phosphate-buffered saline solution (1X) containing purified soybean trypsin inhibitor.

Quantity	Cat. No.
100 mL	R-007-100

Coating Matrix Kit

The Coating Matrix Kit is a convenient combination of Coating Matrix and Dilution Medium for treatment of tissue culture labware for keratinocyte culture. The kit contains enough material to coat approximately thirty T-25 flasks.

Quantity	Cat. No.
1 kit	R-011-K

Synth-a-Freeze Cryopreservation Medium

A defined, protein-free, sterile cryopreservation medium containing 10% DMSO. This solution is suitable for the cryopreservation of all cell types, with the exception of melanocytes.

Quantity	Cat. No.
50 mL	A12542-01

TrypLE Express, Stable Trypsin Replacement Enzyme (1X), liquid

TrypLE™ Express, Stable Trypsin Replacement Enzyme is formulated in DPBS with 1 mM EDTA. It is currently validated for use with human corneal epithelial cells. It contains no phenol red.

Quantity	Cat. No.
100 mL	12604-013
500 mL	12604-021
20 x 100 mL (case)	12604-039

Related cell culture reagents

The following products have not been validated with the primary cells listed in this sourcebook. We are continuing to build our application database. For a complete list of cell culture reagents, please go to **thermofisher.com/gibco**

Collagenase Type I, lyophilized

Prepared from *Clostridium histolyticum* for dissociation of tissues. Suggested uses are for epithelial, lung, fat, and adrenal tissue cell preparations.

Quantity	Cat. No.
500 mg	17018-029
1 g	17100-017

Collagenase Type II

Prepared from *Clostridium histolyticum* for dissociation of tissues. Suggested use is for preparation of cells from liver, bone, thyroid, heart, and salivary gland tissue.

Quantity	Cat. No.
1 g	17101-015

Collagenase Type IV

Prepared from *Clostridium histolyticum* for dissociation of cells from pancreas tissue. The suggested use is for isolation of pancreatic islets.

Quantity	Cat. No.
1 g	17104-019

Dispase II

Prepared from *Bacillus polymyxa*. It can be used for gentle dissociation of animal tissues to release individual cells.

Quantity	Cat. No.
5 g	17105-041

Fungizone™ Antimycotic, liquid

Contains 250 µg of amphotericin B and 205 µg of sodium deoxycholate per mL as a solubilizer in distilled water. **Spectrum:** fungi and yeasts.

Recommended concentration: 0.25 to 2.5 µg/mL.

Attention: This material is hazardous. All persons using this product should review the Material Safety Data Sheet before handling.

Quantity	Cat. No.
20 mL	15290-018

Gentamicin Reagent Solution, liquid

Contains 50 mg/mL gentamicin sulfate in distilled water.

Spectrum: gram-positive and gram-negative bacteria.

Recommended concentration: 0.5 to 50 µg/mL.

Attention: This material is hazardous. All persons using this product should review the Material Safety Data Sheet before handling.

Concentration	Quantity	Cat. No.
10 mg/mL	10 mL 10 x 10 mL (case)	15710-064 15710-072
50 mg/mL	10 mL 10 x 10 mL (case)	15750-060 15750-078

Recovery Cell Culture Freezing Medium

A complete cryopreservation medium for mammalian cell cultures. Recover more cells with Recovery™ Cell Culture Freezing Medium, which offers these advantages:

- Increases cell viability an average of 25%
- Saves time, allowing recovery of more cells sooner
- A convenient, fully supplemented formulation
- Safety—no messy mixing of DMSO required

Contains Dulbecco's Modified Eagle Medium (DMEM), fetal bovine serum, bovine serum, and 10% DMSO.

Quantity	Cat. No.
50 mL	12648-010

TrypLE Select, Stable Trypsin Replacement Enzyme (1X), liquid

An animal-origin free cell dissociation enzyme. This recombinant enzyme is an alternative to animal trypsin for the dissociation of adherent mammalian cells from plasticware. The enzyme is formulated in DPBS with 1 mM EDTA. It contains no phenol red. It is stable at 15°C to 30°C for 6 months.

Quantity	Cat. No.
100 mL	12563-011
500 mL	12563-029

TrypLE Express, Stable Trypsin Replacement Enzyme (1X), liquid

A pure enzyme for gentler cell dissociation. This recombinant enzyme is an alternative to animal trypsin for the dissociation of adherent mammalian cells from plasticware. TrypLE Express is based on the same enzyme found in TrypLE Select, but is manufactured with economies of scale. The enzyme is formulated in DPBS with 1 mM EDTA. It contains phenol red. It is stable at 15°C to 30°C for 6 months.

Quantity	Cat. No.
100 mL	12605-010
500 mL	12605-028
20 x 100 mL (case)	12605-036

Trypsin, 0.25% (1X), liquid

Trypsin, 0.25% (1X), liquid is porcine parvovirus– and mycoplasma-tested. It contains phenol red, 2.5 g/L of trypsin (1:250) in Hanks' Balanced Salt Solution without $CaCl_2$, $MgCl_2 \cdot 6H_2O$, and $MgSO_4 \cdot 7H_2O$.

Source: Porcine

Quantity	Cat. No.
100 mL	15050-065 US 25050-014 EU
500 mL	15050-057

Trypsin, 2.5% (10X), liquid

Trypsin, 2.5% (10X), liquid is porcine parvovirus– and mycoplasma-tested. It contains 25 g/L of trypsin (1:250) and 8.5 g/L of NaCl, but no phenol red.

Source: Porcine

Dilution: Aseptically prepare 1X solution in balanced salt solution without Ca^{++} or Mg^{++}. Final concentration: 2.5 g/L of trypsin (1:250).

Quantity	Cat. No.
100 mL	15090-046

Trypsin-EDTA

(0.5% trypsin, EDTA•4Na) (10X), liquid

Trypsin-EDTA is porcine parvovirus– and mycoplasma-tested. It contains 5.0 g/L of trypsin (1:250), 2.0 g/L of EDTA•4Na, and 8.5 g/L of NaCl, but no phenol red.

Dilution: Aseptically prepare 1X solution in balanced salt solution without Ca^{++} or Mg^{++}.

Final concentration: 0.5 g of trypsin and 0.2 g EDTA•4Na per liter (1:250).

Quantity	Cat. No.
100 mL	15400-054

Trypsin-EDTA (0.05% trypsin, EDTA•4Na) (1X), liquid

Trypsin-EDTA is porcine parvovirus– and mycoplasma-tested.

It contains phenol red, 0.5 g/L of trypsin (1:250), and 0.2 g/L of EDTA•4Na in Hanks' Balanced Salt Solution without $CaCl_2$, $MgCl_2 \cdot 6H_2O$, or $MgSO_4 \cdot 7H_2O$.

Quantity	Cat. No.
100 mL	25300-054
20 x 100 mL (case)	25300-120
500 mL	25300-062

Trypsin-EDTA (0.25% trypsin, EDTA•4Na) (1X), liquid

Trypsin-EDTA is porcine parvovirus– and mycoplasma-tested.

It contains phenol red, 2.5 g/L of trypsin (1:250), and 0.38 g/L of EDTA•4Na in Hanks' Balanced Salt Solution without $CaCl_2$, $MgCl_2 \cdot 6H_2O$, or $MgSO_4 \cdot 7H_2O$.

Quantity	Cat. No.
100 mL	25200-056
20 x 100 mL (case)	25200-114
500 mL	25200-072

Related cell culture products

Product	Optimized for	Applications	Quantity	Cat. No.
Human Endothelial-SFM*	Primary and secondary human umbilical venous, microvascular, and arterial endothelial cells	Growth and maintenance to study cell-cell interactions, injury analysis, atherosclerosis, signal transduction, cytokine production, and cell matrix interaction Requires supplementation with bFGF, EGF, and fibronectin (sold separately).	500 mL	11111-044
HepatoZYME-SFM	Primary human, monkey, and rat hepatocytes	Maintenance of hepatocytes (cytochrome P450 induction maintained >9 days)	500 mL	17705-021
Keratinocyte-SFM (with EGF, BPE)*	Human epidermal keratinocytes and cervical epithelial cells (will not support fibroblast or melanocyte cells)	Growth and maintenance for dermal substitutes, gene therapy, and *in vitro* toxicology	500 mL	17005-042 US 17005-075 EU
Keratinocyte-SFM (without CaC_2)*			500 mL	37010-022
Defined Keratinocyte-SFM*		Low-protein (<25 µg/mL), BPE-free medium for cultivation of keratinocytes Can be used for cervical epithelial cells for studies involving the human papilloma virus	500 mL	10744-019
Medium 171	Human mammary epithelial cells	Growth and maintenance of human mammary epithelial cells	500 mL	M-171-500
Mammary Epithelial Growth Supplement		Use with Medium 171 to culture mammary epithelial cells	5 mL	S-015-5
LHC Basal Medium	Bronchial epithelial cells	Asthma, allergy, cystic fibrosis, lung, and esophageal cancer research	500 mL 1,000 mL	12677-019 12677-027
LHC-8 Medium			500 mL	12678-017
LHC-8 Medium (without gentamicin)			500 mL	12679-015
LHC-9 Medium			500 mL	12680-013

* Drug master file available.

Matrices and 3D culture systems

Gibco products including extracellular matrices, laminin, scaffolds, and proteins allow *in vivo*–like morphology and physiologically relevant environments for more realistic cell biology and better intercellular interactions.

Geltrex LDEV-Free Reduced Growth Factor Basement Membrane Matrix

Geltrex™ LDEV-free matrix is a soluble form of reduced growth factor (RGF) basement membrane extract (BME) purified from a continuous sheet of specialized extracellular matrix that forms an interface between Engelbreth-Holm-Swarm (EHS) tumor cells. It is free of viruses, including lactose dehydrogenase elevating virus (LDEV), sometimes found in this type of preparation. The major components of Geltrex matrix include laminin, collagen IV, entactin, and heparan sulfate proteoglycan, which provide the foundation for three-dimensional (3D) culture studies.

Geltrex matrix can be used for promotion and maintenance of a differentiated phenotype in a variety of cell cultures including primary epithelial cells, endothelial cells, hepatocytes, and smooth muscle cells. It has been used in angiogenesis assays, neurite outgrowth assays, and tumor cell invasion assays.

Following appropriate dilutions, Geltrex matrix is a ready-to-use soluble form of basement membrane matrix that requires no additional treatment before use. Depending on the application, different thicknesses and concentrations of Geltrex matrix are required.

Quantity	Cat. No.
1 mL	A1413201
5 mL	A1413202

AlgiMatrix 3D Culture System

We developed the AlgiMatrix™ 3D Culture System to be the first user-friendly, animal-free bioscaffold available for the development of higher-fidelity cell culture models that are more predictive of disease states and drug responses.

The AlgiMatrix 3D Culture System is available in 6-well, 24-well, and 96-well formats that integrate easily into any workflow. Cells can be inoculated directly into sterile microtiter plates preloaded with lyophilized alginate sponge; no pretreatment or other preparation is required.

The AlgiMatrix 3D Culture System is suitable for a broad range of procedures, including multicellular tumor spheroid assays (MCTS) [1], hepatocyte [2–4], and cardiomyocyte organogenesis studies [5], as well as co-culture studies [6], high-throughput drug screening assays [1], and embryonic stem cell 3D differentiation [7]. This broad applicability fulfills a critical need for cell-based screening, drug discovery, and *in vitro* human cell therapy research.

References

1. Kunz-Schughart LA, Freyer JP, Hofstaedter F et al. (2004) The use of 3-D cultures for high-throughput screening: the multicellular spheroid model. *J Biomol Screen* 9:273–285.
2. Dvir-Ginzberg M, Gamlieli-Bonshtein I, Agbaria R et al. (2003) Liver tissue engineering within alginate scaffolds: effects of cell-seeding density on hepatocyte viability, morphology, and function. *Tissue Eng* 9:757–766.
3. Elkayam T, Amitay-Shaprut S, Dvir-Ginzberg M et al. (2006) Enhancing the drug metabolism activities of C3A--a human hepatocyte cell line—by tissue engineering within alginate scaffolds. *Tissue Eng* 12:1357–1368.
4. Kedem A, Perets A, Gamlieli-Bonshtein I et al. (2005) Vascular endothelial growth factor-releasing scaffolds enhance vascularization and engraftment of hepatocytes transplanted on liver lobes. *Tissue Eng* 11:715–722.
5. Dar A, Shachar M, Leor J et al. (2002) Optimization of cardiac cell seeding and distribution in 3D porous alginate scaffolds. *Biotechnol Bioeng* 80:305–312.
6. Kim J (2005) Three-dimensional tissue culture models in cancer biology. *Semin Cancer Biol* 15:365–377.
7. Gerecht-Nir S, Cohen S, Ziskind A et al. (2004) Three-dimensional porous alginate scaffolds provide a conducive environment for generation of well-vascularized embryoid bodies from human embryonic stem cells. *Biotechnol Bioeng* 88:313–320.

Quantity	Cat. No.
1 x 6-well plate	A10982-01
4 x 6-well plates	A10982-02
1 x 24-well plate	12684-023
4 x 24-well plates	12684-049
1 x 96-well plate	12684-015
5 x 96-well plates	12684-031
Firming buffer (50 mL)	A1091501
Dissolving buffer (50 mL)	A1134001

Collagen I, Rat Tail and Collagen I, Bovine

Collagen is the cell culture tissue workhorse of basic coating and gel preparations for growing attachment cells, supporting migration, and tissue morphogenesis. We offer Collagen I Rat Tail (in liquid form and on precoated tissue culture plates) and Collagen I Bovine (in liquid form) for 3D applications and as coating solution. The precoated plates can be stored at room temperature for a maximum shelf life of 2 years, and are ready to use with no additional preparation.

Product	Quantity	Cat. No.
Collagen I, Rat Tail	20 mL	A1048301
Collagen I, Bovine	10 mL	A10644-01
Collagen I, coated 6-well plate	5 plates	A11428-01
Collagen I, coated 24-well plate	5 plates	A11428-02
Collagen I, coated 96-well plate	5 plates	A11428-03

Angiogenesis Starter Kit

The Angiogenesis Starter Kit contains the reagents and protocols necessary to perform various angiogenesis assays. Designed to address the needs of both the occasional user and the most experienced researcher, this combination of high-quality products is easy to use and cost-effective. A detailed protocol for the tube formation assay is provided with the kit. The kit includes Large Vessel Endothelial Supplement (LVES), 50X, 11 mL; Medium 200 basal medium, 500 mL; Human Umbilical Vein Endothelial Cells (HUVEC), 1 vial, 5 x 10^5 cells; and Geltrex LDEV-Free Reduced Growth Factor Basement Membrane Matrix, 5 mL.

Quantity	Cat. No.
1 kit	A1460901

Natural Mouse Laminin

Laminin is the major glycoprotein component of basement membranes, with a cross-like shape containing three short arms and one long arm. This structure allows for the modulation of such functions as cell attachment, cell spreading, cell growth and motility, and binding to itself and other matrix components to promote epithelial differentiation, modification of leukocyte function, and stimulation of neurite outgrowth. This natural preparation of mouse laminin is isolated from Engelbreth-Holm-Swarm (EHS) sarcoma.

Quantity	Cat. No.
1 mg	23017-015

Primary cell transfection

Transfection, the introduction of nucleic acids into mammalian cells, is essential to analyses of gene expression and regulation, cell signaling, and development of cell-based assays. Traditionally, because of ease of use and being more amenable to experimental manipulation, established mammalian cell lines have been preferentially used as models in these types of studies. Several methods of transfection have been developed, the most widely used being the use of liposomes to deliver DNA and RNA into cells. Liposome-based transfection is effective, easy to use, and affordable, requiring no capital expenditure, unlike methods such as electroporation, sonoporation, microinjection, and particle delivery.

With the need to expand our understanding of various disease pathways, there is increasing focus on the use of relevant primary cells as experimental models. Primary cells more closely simulate true physiological conditions. Functional studies using primary cells provide relevant data needed for clinical and therapeutic applications.

While liposome-based transfection reagents are effective for transfecting most established cell lines, they have generally not been effective for transfecting primary cells and the so-called difficult-to-transfect cells. These include cells of hematopoietic origin, including B and T cells, macrophages, dendritic cells, and natural killer cells. Stem cells and endothelial cells have also been refractory to liposome-based transfection. Thus, while these groups of cells have been used in experiments, traditional lipid-based transfection technologies have provided limited expression for analysis. Moreover, other methods, including electroporation or direct microinjection, are more expensive and tedious, which can limit functional studies following gene delivery.

We have developed Invitrogen™ Lipofectamine™ LTX Reagent, a new animal origin–free liposomal transfection reagent, to efficiently deliver plasmids into primary cells and hard-to-transfect cells. In the presence of Invitrogen™ PLUS™ Reagent, Lipofectamine LTX Reagent delivers plasmids at higher efficiencies with greater than 90% cell viability. Thus, researchers now have an alternative to relatively expensive transfection methods including electroporation and microinjection, and to the relatively unsafe viral delivery methods to deliver plasmids into liposome-refractory cells.

Transfection of primary endothelial cells

To investigate whether cells transfected with Lipofectamine LTX Reagent and PLUS Reagent maintained expected physiology, we asked whether these reagents affected differentiation of human umbilical vein endothelial cells (HUVECs). HUVECs undergo chemotaxis, invasion, and differentiation into capillary-like structures on reconstituted basement membrane proteins [1]. They are model cells in chemotaxis research as well as studies of angiogenesis in cancer research and drug development [2]. We established that Lipofectamine LTX Reagent transfected HUVECs at high efficiency (>50%) and that the transfected cells differentiated to capillary-like structures on BD Matrigel™ matrix. These data indicate that Lipofectamine LTX Reagent, with PLUS Reagent, is compatible with angiogenesis research.

References

1. Bernardini G, Spinetti G, Ribatti D et al. (2000) I-309 binds to and activates endothelial cell functions and acts as an angiogenic molecule *in vivo*. *Blood* 96:4039–4045.
2. Mukherjee A, Westwell AD, Bradshaw TD et al. (2005) Cytotoxic and anti-angiogenic activity of AW464 (NSC) 706704), a novel thioredoxin inhibitor: An *in vitro* study. *Br J Cancer* 92:350–358.

Product	Quantity	Cat. No.
Lipofectamine LTX Reagent	1.0 mL	15338-100
PLUS Reagent	0.85 mL	11514-015

Go to **thermofisher.com/transfection**

Neon Transfection System

For simple transfection of stem cells, we offer the Invitrogen™ Neon™ Transfection System, a next-generation electroporation technology for highly efficient delivery (~80%) of nucleic acids (plasmid DNA and siRNA) into virtually any animal cell type.

- The Neon Transfection System has been demonstrated to transfect many difficult-to-transfect cells, including stem cells and primary cells
- Using a fail-safe optimization experiment, conditions are easily adjusted to maximize delivery efficiency and cell viability

Cat. No. MPK5000

Go to **thermofisher.com/neon**

BacMam technology

BacMam technology is based on an insect virus (baculovirus) to help efficiently deliver and express genes in mammalian cells. The baculovirus has been modified to include an expression cassette for transgene expression in mammalian cells.

- Efficient transduction of mammalian cell lines, including primary cells (fibroblasts, hepatocytes, cardiovascular cells, and epithelial cells) and stem cells (neuronal and mesenchymal)
- Safe transduction (nonreplicating in mammalian cells) and lack of observable cytopathic effect
- Frozen storage of pre-transduced cells generates assay-ready cells
- Assay development speed is increased (no need to spend time generating a stable cell line)

Go to **thermofisher.com/bacmam**

Primary cell visualization

FLoid Cell Imaging Station

Designed in collaboration with fluorescence microscopy users, the Invitrogen™ FLoid™ Cell Imaging Station captures high-quality, three-color fluorescent cell images right at your benchtop, with an interface that is so simple even novice users can collect data in just a few clicks of the mouse. We have used the FLoid Cell Imaging Station in our primary cell experimental protocols during passaging to easily observe and monitor cell dissociation.

Cat. No. 4471136

Countess Automated Cell Counter

The Invitrogen™ Countess™ Automated Cell Counter offers easy and accurate cell counting and viability counts. You can get all the data you need about your cell cultures in just 30 seconds without using a hemocytometer. The Countess Automated Cell Counter is excellent for counting primary cells during the plating and passaging steps of our culture protocols.

Cat. No. C10227

Primary cell detection

We offer a host of products that are designed to enable further engineering of primary cells, as well as analysis of activity and function within primary cell models. These include detection technologies such as Invitrogen™ CellLight™ reagents and Premo™ Cameleon reagents.

CellLight reagents

CellLight reagents are ready-to-use fluorescent protein constructs targeted to specific subcellular structures. These reagents provide a simple and effective method for introducing targeted intracellular labels within living cells. Simply add the reagent to your cells, incubate overnight, and you're ready to image your cells. CellLight reagents come in a variety of colors and targets, including actin, endosomes, lysosomes, and tubulin, for convenient multiplexing and colocalization studies. Cellular labeling with CellLight reagents employs BacMam technology, which uses a modified insect cell baculovirus coupled with a mammalian promoter as a vehicle to efficiently deliver and express genes in mammalian cells. Unlike expression vectors, BacMam reagents enable titratable and reproducible expression and offer high co-transduction efficiency, enabling multiple BacMam reagents to be used in the same cell.

Go to **thermofisher.com/celllight**

Premo Cameleon Calcium Sensor

Premo Cameleon Calcium Sensor is a no-wash, nonorganic dye indicator for intracellular calcium signal measurements. It is provided as a ready-to-use baculovirus stock containing the cameleon DNA, which is efficiently delivered to target cells prior to cell plating. The stock is used in conjunction with a Premo™ enhancer for increased sensor expression in multiple cell types, including primary cells. The Premo Cameleon Calcium Sensor readily and accurately detects intracellular calcium flux from different receptors.

Go to **thermofisher.com/premocameleon**

Proliferating primary cell cultures

We offer many of the human primary cell types included in this sourcebook as proliferating cultures, sourced from the industry's largest and most reliable tissue sourcing network. These cultures are currently ONLY AVAILABLE IN THE UNITED STATES. Setup is required. Information on availability (including isolation schedules) of these cells can be obtained through our technical service team.

Tissue	Product	Quantity	Cat. No.
Keratinocytes, neonatal	HEKn, prepared in EpiLife Medium and HKGS	6 x T-25 flasks	C-001-25P-A
	HEKn, prepared in EpiLife Medium and EDGS	6 x T-25 flasks	C-001-25P-B
	HEKn, prepared in EpiLife Medium and Supplement S7	6 x T-25 flasks	C-001-25P-C
	HEKn, prepared in EpiLife-PRF Medium and HKGS	6 x T-25 flasks	C-001-25P-D
	HEKn, prepared in EpiLife-PRF Medium and EDGS	6 x T-25 flasks	C-001-25P-E
	HEKn, prepared in EpiLife-PRF Medium and Supplement S7	6 x T-25 flasks	C-001-25P-F
	HEKn, prepared in Medium 154 and HKGS	6 x T-25 flasks	C-001-25P-G
	HEKn, prepared in Medium 154PRF and HKGS	6 x T-25 flasks	C-001-25P-H
Keratinocytes, adult	HEKa, prepared in EpiLife Medium and HKGS	6 x T-25 flasks	C-005-25P-A
	HEKa, prepared in EpiLife Medium and EDGS	6 x T-25 flasks	C-005-25P-B
	HEKa, prepared in EpiLife Medium and Supplement S7	6 x T-25 flasks	C-005-25P-C
	HEKa, prepared in EpiLife-PRF Medium and HKGS	6 x T-25 flasks	C-005-25P-D
	HEKa, prepared in EpiLife-PRF Medium and EDGS	6 x T-25 flasks	C-005-25P-E
	HEKa, prepared in EpiLife-PRF Medium and Supplement S7	6 x T-25 flasks	C-005-25P-F
	HEKa, prepared in Medium 154 and HKGS	6 x T-25 flasks	C-005-25P-G

Tissue	Product	Quantity	Cat. No.
Melanocytes, neonatal, lightly pigmented	HEMn-LP, prepared in Medium 254 and HMGS	3 x T-25 flasks	C-002-25P-A
	HEMn-LP, prepared in Medium 254 and HMGS-2	3 x T-25 flasks	C-002-25P-B
Melanocytes, neonatal, moderately pigmented	HEMn-MP, prepared in Medium 254 and HMGS	3 x T-25 flasks	C-102-25P-A
	HEMn-MP, prepared in Medium 254 and HMGS-2	3 x T-25 flasks	C-102-25P-B
Melanocytes, neonatal, darkly pigmented	HEMn-DP, prepared in Medium 254 and HMGS	3 x T-25 flasks	C-202-25P-A
	HEMn-DP, prepared in Medium 254 and HMGS-2	3 x T-25 flasks	C-202-25P-B
Melanocytes, adult, lightly pigmented	HEMa-LP, prepared in Medium 254 and HMGS-2	3 x T-25 flasks	C-024-25P-B
Fibroblasts, neonatal	HDFn, prepared in Medium 106 and LSGS	6 x T-25 flasks	C-004-25P-A
Fibroblasts, adult	HDFa, prepared in Medium 106 and LSGS	3 x T-25 flasks	C-013-25P-A
Microvascular endothelial cells, neonatal	HMVECnd, prepared in Medium 131 and MVGS	3 x T-25 flasks	C-010-25P-A
Microvascular endothelial cells, adult	HMVECad, prepared in Medium 131 and MVGS	3 x T-25 flasks	C-011-25P-A
Aortic endothelial cells	HAEC, prepared in Medium 200 and LSGS	6 x T-25 flasks	C-006-25P-A
Pulmonary artery endothelial cells	HPAEC, prepared in Medium 200 and LSGS	6 x T-25 flasks	C-008-25P-A
	HPAEC, prepared in Medium 200PRF and LSGS	6 x T-25 flasks	C-008-25P-B
Umbilical vein endothelial cells	HUVEC, prepared in Medium 200 and LSGS	6 x T-25 flasks	C-003-25P-A
	HUVEC, prepared in Medium 200PRF and LSGS	6 x T-25 flasks	C-003-25P-B
	HUVEC-pooled, prepared in Medium 200 and LSGS	6 x T-25 flasks	C-015-25P-A
	HUVEC-pooled, prepared in Medium 200PRF and LSGS	6 x T-25 flasks	C-015-25P-B
Aortic smooth muscle cells	HASMC, prepared in Medium 231 and SMGS	6 x T-25 flasks	C-007-25P-A
Pulmonary artery smooth muscle cells	HPASMC, prepared in Medium 231 and SMGS	6 x T-25 flasks	C-009-25P-A

gibco

Custom primary cell products and services

We welcome requests for custom preparations of cell culture products and contract research. Please contact us and we will work with you to develop a solution that meets your research and budgetary needs.

The custom order process is designed on an individual basis, enabling us to tailor the process to suit each request. Once we determine the specifications for the project, we will provide you with a quote for all work and a timeframe for its completion. As always, our technical support and customer service staff are available to assist you every step of the way—from developing the initial specifications to final packaging and delivery.

We have the technical and manufacturing capabilities to produce a wide variety of customized cell culture media and reagents. From slight formulation modifications to complicated engineered-to-order products, custom products are available in both standard and highly specialized packaging configurations. Wherever possible, we can formulate custom media with non–animal origin components and offer developmental support to help you reengineer formulations to allow you to meet regulatory and performance goals. The Gibco brand is the only brand that offers four distinct formats for media: ready-to-use (1X) liquid media, dry powder media (DPM), liquid media concentrates (LMCs), and Advanced Granulation Technology™ (AGT™) media.

Custom cell culture products and services

- Custom cell isolations and configurations
- Custom medium and supplement formulations
- Cell pellets suitable for RNA isolation and other purposes
- Additional cell characterization and virus testing
- SynerGy™ Selector—online bag design tool

Contact your account manager or technical sales specialist, or email our custom services team at **discoveryservices@thermofisher.com** for more details.

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