



Key products for dermatological cell culture

- Primary cells give you greater physiological relevance
- Complete cell culture systems designed and optimized to work together
- Backed by expert technical support

Invitrogen's Cascade Biologics® primary cells have been developed to work together for optimal performance. When your cell culture research demands relevance, reliability, and robustness, choose Cascade Biologics® primary cells to meet your most critical needs.

Table 1—Cascade Biologics® products for dermatological research.*

Primary human cells (cryopreserved)	Keratinocytes <ul style="list-style-type: none"> • Neonatal (C-001-5C) • Adult (C-005-5C) 	Melanocytes <ul style="list-style-type: none"> • Neonatal, lightly pigmented donor (C-002-5C) • Neonatal, moderately pigmented donor (C-102-5C) • Neonatal, darkly pigmented donor (C-202-5C) • Adult, lightly pigmented donor (C-024-5C) 	Dermal fibroblasts <ul style="list-style-type: none"> • Neonatal (C-004-5C) • Adult (C-013-5C) 	Dermal microvascular endothelial cells <ul style="list-style-type: none"> • Neonatal (C-010-5C) • Adult (C-011-5C)
	Keratinocytes (prepared APF) <ul style="list-style-type: none"> • Neonatal (C-020-5C) • Adult (C-021-5C) 			
Basal media and growth supplements	EpiLife® medium (500 ml) <ul style="list-style-type: none"> • Standard (M-EPI-500-CA) • Calcium-free (M-EPIcf-500) • Calcium- and phenol red-free (M-EPIcf/PRF-500) 	Medium 254 (500 ml) <ul style="list-style-type: none"> • Standard (M-254-500) • Calcium-free (M-254CF-500) 	Medium 106 (500 ml) (M-106-500)	Medium 131 with attachment factor (500 ml) (M-131-500)
	Human keratinocyte growth supplement (HKGS) <ul style="list-style-type: none"> • Single-addition (S-001-5) • Kit (S-001-K) 	Human melanocyte growth supplement (HMGS) (S-002-5)	Low-serum growth supplement (LSGS) <ul style="list-style-type: none"> • Single-addition (S-003-10) • Kit (S-003-K) 	Microvascular growth supplement (MVGS) (S-005-25)
	EpiLife® defined growth supplement (EDGS) (S-012-5)	Human melanocyte growth supplement-2 (HMGS-2) (S-016-5)		Attachment factor (100 ml) (S-006-100)
	Supplement S7 (S-017-5)			
Subculture and other reagents				
Coating Matrix Kit (R-001-K) Defined trypsin inhibitor (R-007-100) Gentamicin/amphotericin 10-pack (R-015-10) Recombinant trypsin/EDTA (R-009-50) Synth-a-Freeze® cryopreservation medium (R-005-50)				

* The cells listed in Table 1 are also available as proliferating cultures (catalog numbers for proliferating cultures take the form C-xxx-25P). All cells have tested negative for HIV-1, hepatitis B, hepatitis C, mycoplasmas, bacteria, yeast, and other fungi and are highly characterized.

Visit www.invitrogen.com/primarycells to see the entire range of Cascade Biologics®

primary cells and optimized media from Invitrogen Cell Culture.

Keratinocyte culture

Invitrogen offers a wide array of Cascade Biologics® 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 product-free” and use the “APF” abbreviation to identify them.

If you'd like to culture your cells...	Then choose:
<ul style="list-style-type: none"> → In an animal product-free (APF), chemically defined environment → For an extended lifespan 	<ul style="list-style-type: none"> → Cells—HEKn-APF or HEKa-APF → Basal medium—EpiLife® medium → Growth supplement—Supplement S7 → Reagents—recombinant trypsin/EDTA, defined trypsin inhibitor, gentamicin/amphotericin, Synth-a-Freeze® cryopreservation medium, Coating Matrix Kit
<ul style="list-style-type: none"> → In a chemically defined environment → For an extended lifespan 	<ul style="list-style-type: none"> → Cells—HEKn or HEKa → Basal medium—EpiLife® medium → Growth supplement—EDGS → Reagents—trypsin/EDTA, defined trypsin inhibitor, gentamicin/amphotericin, Synth-a-Freeze® cryopreservation medium
<ul style="list-style-type: none"> → In a BPE-containing environment → For an extended lifespan 	<ul style="list-style-type: none"> → Cells—HEKn or HEKa → Basal medium—EpiLife® medium → Growth supplement—HKGS → Reagents—trypsin/EDTA, trypsin neutralizer, gentamicin/amphotericin, Synth-a-Freeze® cryopreservation medium
<ul style="list-style-type: none"> → In a BPE-containing environment → For a standard lifespan 	<ul style="list-style-type: none"> → Cells—HEKn or HEKa → Basal medium—Medium 154 → Growth supplement—HKGS → Reagents—trypsin/EDTA, trypsin neutralizer, gentamicin/amphotericin, Synth-a-Freeze® cryopreservation medium

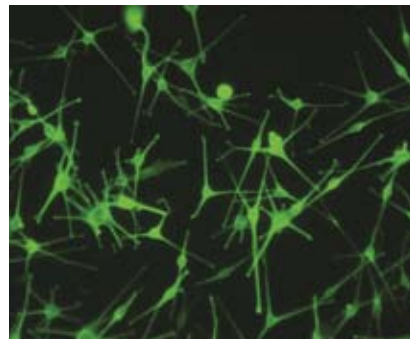


Figure 1—Adult melanocytes, incubated with a primary antibody directed against Mel-5, which was then detected using a fluorescein-labeled secondary antibody.

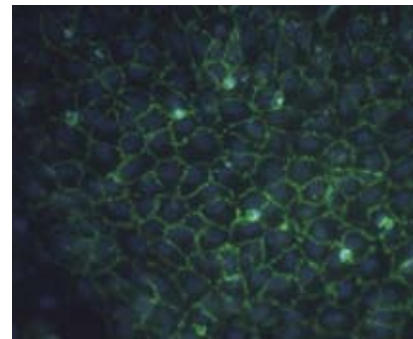


Figure 2—Microvascular endothelial cells stained using an anti-CD31 primary antibody in conjunction with a fluorescein-labeled secondary antibody. Nuclei were counterstained with DAPI.

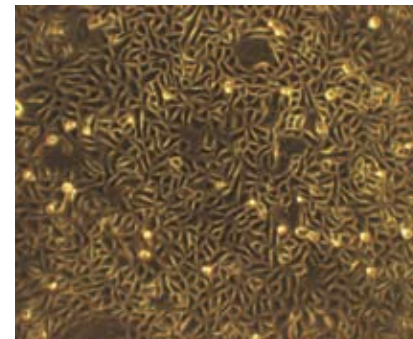


Figure 3—Phase-contrast image of neonatal human epidermal keratinocytes.

Selected references

Dermatological research references that cite the use of Cascade Biologics® products:

Braff, M.H. et al. (2005) Structure-function relationships among human cathelicidin peptides: dissociation of antimicrobial properties from host immunostimulatory activities. *J Immunol* 174(7): 4271–4278.
(Neonatal human epidermal keratinocytes; EpiLife® medium; EpiLife® defined growth supplement)

Cardinali, G. et al. (2005) Keratinocyte growth factor promotes melanosome transfer to keratinocytes. *J Invest Dermatol* 125(6): 1190.
(Adult human epidermal keratinocytes; medium 154; human keratinocyte growth supplement; human melanocyte growth supplement)

Gasser, S. et al. (2005) The DNA damage pathway regulates innate immune system ligands of the NKG2D receptor. *Nature* 436(7054): 1186.
(Neonatal human dermal fibroblasts; medium 106)

Hu, P. et al. (2003) Keratinocyte adherens junctions initiate nuclear signaling by translocation of plakoglobin from the membrane to the nucleus. *J Invest Dermatol* 121(2): 242–251.
(Neonatal human epidermal keratinocytes; medium 154; Human keratinocyte growth supplement; PSA solution)

Iordanov, M.S. et al. (2002) The UV (ribotoxic) stress response of human keratinocytes involves the unexpected uncoupling of the ras-extracellular signal-regulated kinase signaling cascade from the activated epidermal growth factor receptor. *Mol Cell Biol* 22(15): 5380–5394.
(Neonatal human epidermal keratinocytes; EpiLife® medium; human keratinocyte growth supplement)

Kern, A. et al. (2001) Modification of fibroblast γ -interferon responses by extracellular matrix. *J Invest Dermatol* 117: 112–118.
(Human microvascular endothelial cells; medium 131; microvascular growth supplement)

Krakowski, A.R. et al. (2005) Cytoplasmic SnoN in normal tissues and nonmalignant cells antagonizes TGF- β signaling by sequestration of the Smad proteins. *Proc Natl Acad Sci USA* 102(35): 12437–12442.
(Adult human epidermal keratinocytes; EpiLife® medium; EpiLife® defined growth supplement)

Postovit, L.-M. et al. (2006) A 3-D model to study the epigenetic effects induced by the microenvironment of human embryonic stem cells. *Stem Cells* 24(3): 501–505.
(Neonatal human epidermal melanocytes from lightly-pigmented tissue; medium 254; human melanocyte growth supplement)

Ray, S.S. and Swanson, H.I. (2004) Dioxin-induced immortalization of normal human keratinocytes and silencing of p53 and p16INK4a. *J Biol Chem* 279(26): 27187–27193.
(Neonatal human epidermal keratinocytes; EpiLife® medium; EpiLife® defined growth supplement)

Sakaguchi, M. et al. (2005) Targeted disruption of transcriptional regulatory function of p53 by a novel efficient method for introducing a decoy oligonucleotide into nuclei. *Nucleic Acids Res* 33(9): e88.
(Neonatal human epidermal keratinocytes; EpiLife® medium; human keratinocyte growth supplement, V2)

Sakaguchi, M. et al. (2005) Bifurcated converging pathways for high Ca^{2+} - and TGF β -induced inhibition of growth of normal human keratinocytes. *Proc Natl Acad Sci USA* 102(39): 13921–13926.
(Human epidermal keratinocytes; EpiLife® medium; human keratinocyte growth supplement, V2)

Seftor, E.A. et al. (2005) Epigenetic transdifferentiation of normal melanocytes by a metastatic melanoma microenvironment. *Cancer Res* 65(22): 10164–10169.
(Medium 254; human melanocyte growth supplement)

Slominski, A. et al. (2004) Differential expression of a cutaneous CRH system. *Endocrinology* 145(2): 941–950.
(Human epidermal keratinocytes; human epidermal melanocytes; human dermal fibroblasts; EpiLife® medium 154; medium 106; EpiLife® defined growth supplement; human melanocyte growth supplement; low serum growth supplement; PSA solution)

Slominski, A. et al. (2004) A novel pathway for sequential transformation of 7-dehydrocholesterol and expression of the P450scc system in mammalian skin. *Eur J Biochem* 271(21): 4178–4188.
(Human epidermal keratinocytes; human epidermal melanocytes; human dermal fibroblasts)

Taylor, K.R. et al. (2004) Hyaluronan fragments stimulate dermal endothelial recognition of injury through TLR4. *J Biol Chem* 279(17): 17079–17084.
(Human microvascular endothelial cells; medium 131; microvascular growth supplement)

Wellbrock, C. and Marais, R. (2005) Elevated expression of MITF counteracts B-RAF-stimulated melanocyte and melanoma cell proliferation. *J Cell Biol* 170(5): 703–708.
(Human epidermal melanocytes; medium 154; human melanocyte growth supplement-2)

Wondrak, G.T. et al. (2006) Antimelanoma activity of apoptogenic carbonyl scavengers. *J Pharmacol Exp Ther* 316(2): 805–814.
(Adult human epidermal keratinocytes; EpiLife® medium; human keratinocytes growth supplement)

Worden, B. et al. (2005) Hepatocyte growth factor/scatter factor differentially regulates expression of proangiogenic factors through Egr-1 in head and neck squamous cell carcinoma. *Cancer Res* 65(16): 7071–7080.
(Human epidermal keratinocytes; medium 154; human keratinocyte growth supplement)

Yang, J. et al. (2006) BMS-345541 targets inhibitor of κ B kinase and induces apoptosis in melanoma: involvement of nuclear factor κ B and mitochondria pathways. *Clin Cancer Res* 12(3): 950–960.
(Human epidermal melanocytes; medium 154; human melanocyte growth supplement)

Yarosh, D.B. et al. (2005) Calcineurin inhibitors decrease DNA repair and apoptosis in human keratinocytes following ultraviolet B irradiation. *J Invest Dermatol* 125(5): 1020.
(Human epidermal keratinocytes; EpiLife® medium 154; human keratinocyte growth supplement)



Cell Culture



Cascade Biologics™
invitrogen cell culture

www.invitrogen.com

©2007 Invitrogen Corporation. All rights reserved. These products may be covered by one or more Limited Use Label Licenses (see Invitrogen catalog or www.invitrogen.com). By use of these products you accept the terms and conditions of all applicable Limited Use Label Licenses. For research use only. Not intended for any animal or human therapeutic or diagnostic use, unless otherwise stated. F-074491-r1 1107