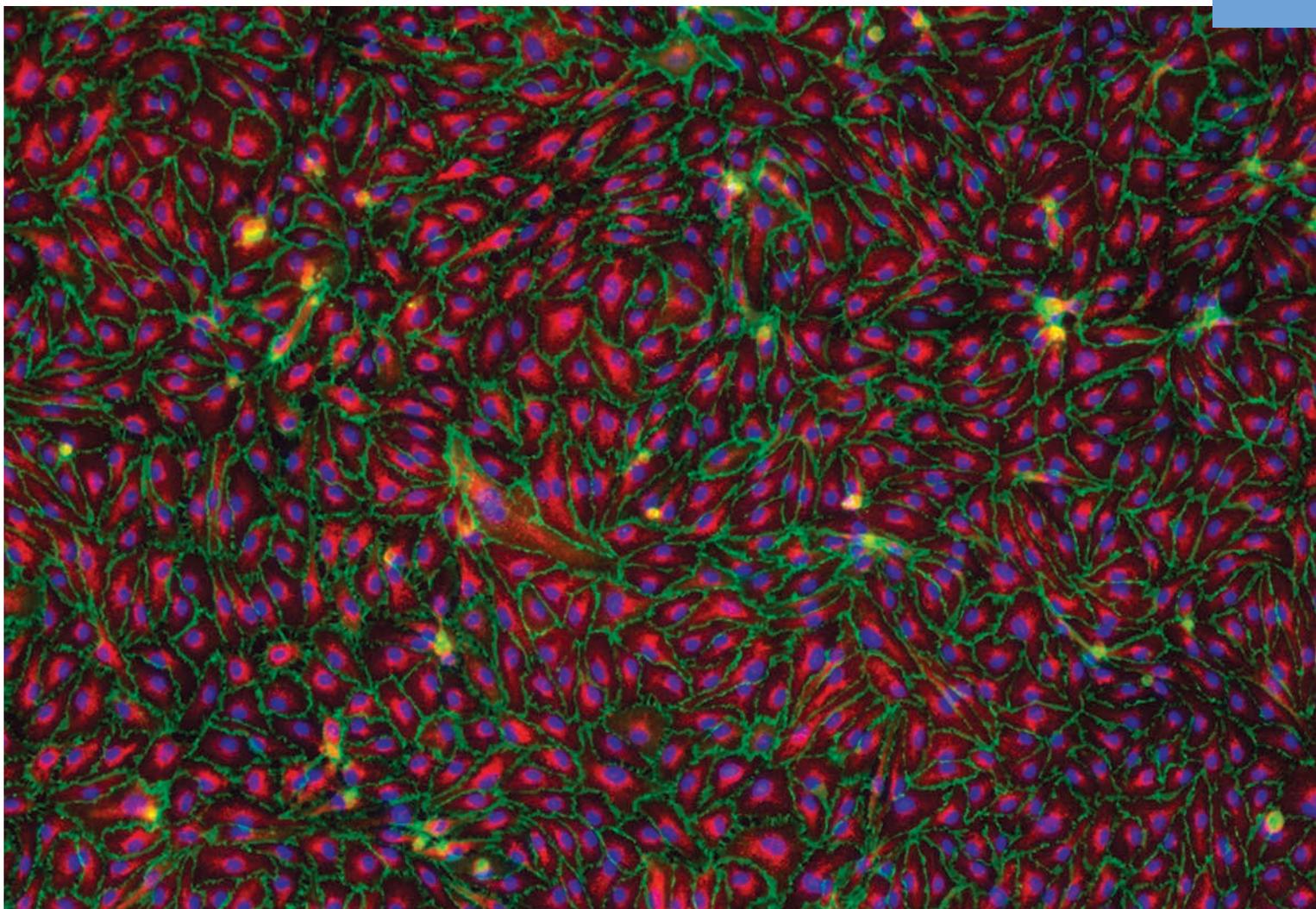


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These products are for research use only.

Not approved for human or veterinary use, for application to humans or animals, or for use in clinical or *in vivo* procedures.

WARNING: Clonetics™ AND Poietics™ products contain human source material, treat as potentially infectious.

Each donor, with the exception of Cord Blood derived products, is tested and found non-reactive by an FDA approved method for the presence of HIV-1, Hepatitis B Virus, and Hepatitis C Virus. Most, but not all, Cord Blood derived products are tested and found non-reactive by an FDA approved method for the presence of Hepatitis C Virus.

Where donor testing is not possible, cell products are tested for the presence of viral nucleic acid from HIV-1, Hepatitis B Virus, and Hepatitis C Virus. Testing cannot offer complete assurance that HIV-1, Hepatitis B Virus, and Hepatitis C Virus are absent. All human sourced products should be handled at the Biological Safety Level 2 to minimize exposure of potentially infectious products, as recommended in the CDC-NIH Manual, "Biosafety in Microbiological and Biomedical Laboratories", 5th ed. If you require further information, please contact your site Safety Officer or Scientific Support.

Product Warranty – Cultures have a finite lifespan *in vitro*.

Lonza guarantees the performance of its cells up to two years from purchase only if appropriate Clonetics™ or Poietics™ Media and Reagents are used exclusively, and the recommended storage and use protocols are followed. Cell and media performance is not guaranteed if any modifications are made to the complete cell system.

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Cell Type / Tissue	Cell Cat. No.	Recommended Medium	Media Cat. No.	Page
Adventitial Fibroblasts				
Aorta	CC-7014	SCGM™	CC-3205	58
Astrocytes				
Human Brain	CC-2565	AGM™	CC-3186	71
C57 Mouse Brain – Mixed	M-AsM-330	AGM™	CC-3186	96
CD1 Mouse Brain – Mixed	M-AsM-430	AGM™	CC-3186	96
Rat Brain Cx-Hi-Cp – Mixed	R-AsM-530	AGM™	CC-3186	96
Rat Brain – Cortex	R-CxAs-520	AGM™	CC-3186	96
Rat Brain – Hippocampus	R-HiAs-521	AGM™	CC-3186	96
Rat Brain – Striatum	R-CpAs-522	AGM™	CC-3186	96
Bone				
Osteoblasts	CC-2538	OGM™	CC-3207	84
Osteoclast Precursors	2T-110	OCP	PT-8001	25
Rat Calvariae Osteoclast	R-OST-583	DMEM™	12-604F	98
Cardiac Myocytes				
Rat Cardiac Myocytes	R-CM-561	RCGM™	CC-4515	92
Chondrocytes				
Cartilage	CC-2550	CGM™	CC-3216	84
Dendritic Cells				
Blood	CC-2701	LGM™ 3	CC-3211	106
Endothelial Cells – Large Vessel				
Aorta	CC-2535	EGM™ 2	CC-3162	58,64
Aortic – Diabetes Type I	CC-2919	EGM™ 2	CC-3162	58,64
Aortic – Diabetes Type II	CC-2920	EGM™ 2	CC-3162	58,64
Coronary Artery	CC-2585	EGM™ 2MV	CC-3202	58,64
Coronary Artery – Diabetes Type I	CC-2921	EGM™ 2MV	CC-3202	58,64
Coronary Artery – Diabetes Type II	CC-2922	EGM™ 2MV	CC-3202	58,64
Iliac Artery	CC-2545	EGM™ 2MV	CC-3202	64
Pulmonary Artery	CC-2530	EGM™ 2	CC-3162	58,64,77
Umbilical Vein – Single Donor	C2517A	EGM™ 2	CC-3162	64
Umbilical Vein – Pooled Donor	C2519A	EGM™ 2	CC-3162	64
Endothelial Cells – Microvascular				
Bladder	CC-7016	EGM™ 2MV	CC-3202	55,66
Blood – Neonatal	CC-2813	EGM™ 2MV	CC-3202	77
Dermal – Adult	CC-2543	EGM™ 2MV	CC-3202	61,66
Dermal Adult – Diabetes Type I	CC-2929	EGM™ 2MV	CC-3202	61,66
Dermal Adult – Diabetes Type II	CC-2930	EGM™ 2MV	CC-3202	61,66
Dermal – Neonatal	CC-2505	EGM™ 2MV	CC-3202	61,66
Dermal – Neonatal, pooled	CC-2516	EGM™ 2MV	CC-3202	66
Cardiac	CC-7030	EGM™ 2MV	CC-3202	58,66
Cardiac – Diabetes Type I	CC-2927	EGM™ 2MV	CC-3202	58,66
Cardiac – Diabetes Type II	CC-2928	EGM™ 2MV	CC-3202	58,66

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Lung	CC-2527	EGM™ 2MV	CC-3202	66,77
Epithelial Cells				
Bronchial / Tracheal (with Retinoic Acid)	CC-2540S	B-ALI™	193514	77
Bronchial / Tracheal (with Retinoic Acid)	CC-2540	BEGM™	CC-3170	77
Bronchial / Tracheal (without Retinoic Acid)	CC-2541	BEGM™	CC-3170	77
Diseased Bronchial / Tracheal – Asthma	194911	BEGM™	CC-3170	78
Diseased Bronchial / Tracheal – Cystic Fibrosis	196979	BEGM™	CC-3170	78
Diseased Bronchial / Tracheal – COPD	195275	BEGM™	CC-3170	78
Kidney (Renal)	CC-2556	REGM™	CC-3190	80
Kidney (Renal) – Cortex	CC-2554	REGM™	CC-3190	80
Kidney (Renal) – Proximal Tubule	CC-2553	REGM™	CC-3190	80
Kidney (Renal) – Proximal Tubule – Diabetes Type II	CC-2925	REGM™	CC-3190	80
Intestinal Epithelial	CC-2931	SmGM™ 2	CC-3182	68
Mammary	CC-2551	MEGM™	CC-3150	70
Prostate	CC-2555	PrEGM™	CC-3166	74,83
Small Airway	CC-2547	SAGM™	CC-3118	77
Small Airway	CC-2547S	SAGM™	CC-3118	77
Diseased Small Airway (Asthma)	CC-2932	SAGM™	CC-3118	78
Diseased Small Airway (COPD)	CC-2934	SAGM™	CC-3118	78
Diseased Small Airway (Cystic Fibrosis)	CC-2933	SAGM™	CC-3118	78
Fibroblasts				
Cardiac – Aortic	CC-2903	FGM™ 3	CC-4526	58
Cardiac – Ventricular	CC-2904	FGM™ 3	CC-4526	58
Dermal – Adult	CC-2511	FGM™ 2	CC-3132	61
Dermal – Neonatal	CC-2509	FGM™ 2	CC-3132	61
Diseased Lung (COPD)	195277	FGM™ 2	CC-3132	78
Diseased Lung (Asthma)	194912	FGM™ 2	CC-3132	78
Diseased Lung (Cystic Fibrosis)	194843	FGM™ 2	CC-3132	78
Embryonic – Mouse	M-FB-481	DMEM	12-604F	93
Intestinal Myofibroblasts	CC-2902	SmGM™ 2	CC-3182	68
Lung	CC-2512	FGM™ 2	CC-3132	77
Periodontal Ligament	CC-7049	SCGM™	CC-3205	84
Hepatocytes				
Human – Induction Qualified	HUCPI	Hepatocyte Thawing, Plating & Maintenance Media	MCHT50, MP100, MM250	112
Human – Metabolism Qualified	HUCPM	Hepatocyte Thawing, Plating & Maintenance Media	MCHT50, MP100, MM250	112
Human – Qualyst Transporter Certified™	HUCPQ	Hepatocyte Thawing, Plating & Maintenance Media	MCHT50, MP100, MM250	112
Human – 10 donor pool	HUCS10P	Hepatocyte Thawing & Maintenance Media	MCHT50, MM250	112
Human – 20 donor pool	HUCS20P	Hepatocyte Thawing & Maintenance Media	MCHT50, MM250	112
Human – Single donor	HUCSD	Hepatocyte Thawing & Maintenance Media	MCHT50, MM250	112
Rat (Sprague Dawley) – Platable	RSCP01	Rat Hepatocyte Thawing, Plating & Maintenance Media	MCRT50, MP100, MM250	114
Rat (Sprague Dawley) – Suspension	RSCS01	Rat Hepatocyte Thawing & Maintenance Media	MCRT50, MM250	114

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Cell Type / Tissue	Cell Cat. No.	Recommended Medium	Media Cat. No.	Page
Rat (Wistar Han) – Platable	RWCP01	Rat Hepatocyte Thawing, Plating & Maintenance Media	MCRT50, MP100, MM250	114
Rat (Wistar Han) – Suspension	RWCS01	Rat Hepatocyte Thawing & Maintenance Media	MCRT50, MM250	114
Rat (Wistar) – Platable	RICP01	Rat Hepatocyte Thawing, Plating & Maintenance Media	MCRT50, MP100,MM250	114
Rat (Wistar) – Suspension	RICS01	Rat Hepatocyte Thawing & Maintenance Media	MCRT50, MM250	114
Rat (Fisher) – Platable	RFCP01	Rat Hepatocyte Thawing, Plating & Maintenance Media	MCRT50, MP100,MM250	114
Rat (Fisher) – Suspension	RFCS01	Rat Hepatocyte Thawing & Maintenance Media	MCRT50, MM250	114
Mouse (CD-1) – Platable	MCCP01	Rat Hepatocyte Thawing, Plating & Maintenance Media	MCRT50, MP100,MM250	114
Mouse (CD-1) – Suspension	MCCS01	Rat Hepatocyte Thawing & Maintenance Media	MCRT50, MM250	114
Mouse (C57Bl/6) – Platable	MBCP01	Rat Hepatocyte Thawing, Plating & Maintenance Media	MCRT50, MP100,MM250	114
Mouse (C57Bl/6) – Suspension	MBCS01	Rat Hepatocyte Thawing & Maintenance Media	MCRT50, MM250	114
Dog (Beagle) – Platable	DBCP01	Cryo NR Animal Hepatocyte Thawing, Plating & Maintenance Media	MCAT50, MP100,MM250	114
Dog (Beagle) – Suspension	DBCS01	Cryo NR Animal Hepatocyte Thawing & Maintenance Media	MCAT50, MM250	114
Monkey (Cynomolgus) – Platable	CYCP01	Cryo NR Animal Hepatocyte Thawing, Plating & Maintenance Media	MCAT50, MP100,MM250	114
Monkey (Cynomolgus) – Suspension	CYCS01	Cryo NR Animal Hepatocyte Thawing & Maintenance Media	MCAT50, MM250	114
Human – Kupffer, Non-Parachymal	HUCLK	Hepatocyte Plating & Maintenance Media	MCKP250, MCKM250	115
Human – Stellate, Non-Parachymal	HUCLS	Stellate Cell Growth Media	MCST250	115
Liver Non-Parenchymal	HUCNP	Hepatocyte Plating Medium	MP100	116
NoSpin HepaRG™	NSHPRG	HepaRG Base Medium, Thawing, Plating, Pre-Induction and Tox, Maintenance/ Metabolism, Induction (serum-free) Media	MH100, MHTAP, MHPIT, MHMET, MHIND	117

Keratinocytes

Epidermal Adult – Diabetes Type II	CC-2926	KGM™ Gold	192060	61
Epidermal Adult – Normal Human	192627	KGM™ Gold	192060	61
Epidermal – Neonatal	192907	KGM™ Gold	192060	61
Epidermal – Neonatal, pooled	192906	KGM™ Gold	192060	61

Melanocytes

Neonatal	CC-2504	MGM™ 4	CC-3249	61
Adult	CC-2586	MGM™ 4	CC-3249	61

Mesangial Cells

Kidney	CC-2559	MsGM™	CC-3146	80
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Myoblasts

Skeletal Muscle	CC-2580	SkGM™ 2	CC-3245	87
Skeletal Muscle Myoblasts – Diabetes Type I	CC-2900	SkGM™ 2	CC-3245	87
Skeletal Muscle Myoblasts – Diabetes Type II	CC-2901	SkGM™ 2	CC-3245	87

More Quick Reference on the next page.

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Preadipocytes Cells				
Subcutaneous	PT-5001	PGM™ 2	PT-8002	27
Subcutaneous– Diabetes Type I	PT-5021	PGM™ 2	PT-8002	27
Subcutaneous– Diabetes Type II	PT-5022	PGM™ 2	PT-8002	27
Visceral	PT-5005	PGM™ 2	PT-8002	27
Visceral– Diabetes Type I	PT-5023	PGM™ 2	PT-8002	27
Visceral– Diabetes Type II	PT-5024	PGM™ 2	PT-8002	27
Neural Progenitor Cells				
Brain	PT-2599	NPMM™	CC-3209	24,71
Neurons				
CD1 Mouse Brain – Cortex	M-Cx-400	PNGM™	CC-4461	96
CD1 Mouse Brain – Hippocampus	M-Hi-401	PNGM™	CC-4461	96
CD1 Mouse Brain – Striatum	M-Cp-402	PNGM™	CC-4461	96
C57 Mouse Brain – Cortex	M-Cx-300	PNGM™	CC-4461	96
C57 Mouse Brain – Striatum	M-Cp-302	PNGM™	CC-4461	96
Rat Brain – Cortex	R-Cx-500	PNGM™	CC-4461	96
Rat Brain – Striatum	R-Cp-502	PNGM™	CC-4461	96
Rat Brain – Hippocampus	R-Hi-501	PNGM™	CC-4461	96
Rat Brain – Hypothalamus	R-Hth-507	PNGM™	CC-4461	96
Rat Brain Cerebellum – Granule Cells	R-Cb-503	PNGM™ A	CC-4512	96
Rat Embryo – Dorsal Root Ganglion	R-eDRG-515	PNGM™	CC-4461	96
Rat Retinal	R-ReT-508	PNGM™	CC-4461	97
Rat Spinal Cord – Dorsal Root Ganglion	R-Drg-505	PNGM™	CC-4461	96
Stem Cells				
Bone Marrow	PT-2501	MSCGM™	PT-3001	29
Dental Pulp	PT-5025	DPSC-GM	PT-3005	26
Adipose	PT-5006	ADSC-GM	PT-4505	19
Adipose - Diabetes Type I	PT-5007	ADSC-GM	PT-4505	19
Adipose - Diabetes Type II	PT-5008	ADSC-GM	PT-4505	19
Skeletal Muscle Cells				
Skeletal Muscle	CC-2561	SkGM™	CC-3160	87
Smooth Muscle Cells				
Aorta	CC-2571	SmGM™ 2	CC-3182	58
Aorta – Diabetes Type I	CC-2914	SmGM™ 2	CC-3182	58
Aorta – Diabetes Type II	CC-2916	SmGM™ 2	CC-3182	58
Aorta – Rat	R-ASM-580	DMEM:F12	BE04-687Q	92
Bladder	CC-2533	SmGM™ 2	CC-3182	55
Bronchial	CC-2576	SmGM™ 2	CC-3182	77
Coronary Artery	CC-2583	SmGM™ 2	CC-3182	58

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Cell Type / Tissue	Cell Cat. No.	Recommended Medium	Media Cat. No.	Page
Coronary Artery– Diabetes Type I	CC-2917	SmGM™ 2	CC-3182	58
Coronary Artery– Diabetes Type II	CC-2918	SmGM™ 2	CC-3182	58
Diseased Bronchial (Asthma)	194850	SmGM™ 2	CC-3182	78
Diseased Bronchial (COPD)	195274	SmGM™ 2	CC-3182	78
Diseased Bronchial (Cystic Fibrosis)	196980	SmGM™ 2	CC-3182	78
Prostate	CC-2587	SmGM™ 2	CC-3182	74,83
Pulmonary Artery	CC-2581	SmGM™ 2	CC-3182	58,77
Pulmonary Artery– Diabetes Type I	CC-2915	SmGM™ 2	CC-3182	58
Pulmonary Artery– Diabetes Type II	CC-2913	SmGM™ 2	CC-3182	58
Umbilical Artery	CC-2579	SmGM™ 2	CC-3182	83
Uterus	CC-2562	SmGM™ 2	CC-3182	83

Stromal Cells

Prostate	CC-2508	SCGM™	CC-3205	74,83
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Cell Type – Tissue	Source – Bone Marrow	Cord Blood	Peripheral	Page
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Hematopoietic Cells

Fresh Bone Marrow	1M-125			21
CD14 ⁺ Monocytes			2W-400A	106
CD34 ⁺ Cells	2M-101	2C-101		23
Mononuclear Cells	2M-125C		CC-2702	104
Stromal Cells	2M-302			104

 Products are available in various sizes. Please refer to the catalog for size information.

Cat. No.	Description	Size	Page
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Hematopoietic Cell Media

PT-3926	HPGM™ Hematopoietic Progenitor Growth Medium	500 mL	104
CC-3211	LGM™ 3 Lymphocyte Growth Medium-3	500 mL	106
04-3800	X-VIVO™ 10 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, gentamicin, and phenol red	1 L	141
04-7430	X-VIVO™ 10 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, without gentamicin or phenol red	1 L	141
04-7440	X-VIVO™ 15 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, without gentamicin or phenol red	1 L	141
BE02-060F	X-VIVO™ 15 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, gentamicin, and phenol red	500 mL	141
04-4180	X-VIVO™ 15 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, gentamicin, and phenol red	1 L	141
04-4480	X-VIVO™ 20 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, gentamicin and phenol red	1 L	141

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Part Number	Proliferating Cell Type Description	Recommended Media	6-well	12-well	24-well	48-well	96-well	T-25	T-75	T-150	T-225
Proliferating Cells – Normal											
CC-7014	AoAF – Human Aortic Adventitial Fibroblasts	SCGM™ BulletKit™	CC-7014W6	CC-7014W12	CC-7014W24	CC-7014W48	CC-7014W96	CC7014T25	CC7014T75	CC7014T150	CC7014T225
CC-2571	AoSMC – Human Aortic Smooth Muscle Cells	SmGM™ 2 BulletKit™	CC-2571W6	CC-2571W12	CC-2571W24	CC-2571W48	CC-0148	CC-2671	CC-0234	CC2571T150	CC2571T225
CC-2533	BdSMC – Human Bladder Smooth Muscle Cells	SmGM™ 2 BulletKit™	CC-2533W6	CC-2533W12	CC-2533W24	CC-2533W48	CC-2533W96	CC-2533T25	CC-2533T75	CC2533T150	CC2533T225
CC-2576	BSMC – Human Bronchial Smooth Muscle Cells	SmGM™ 2 BulletKit™	CC-2576W6	CC-2576W12	CC-2576W24	CC-2576W48	CC-0180	CC-2676	CC-0240	CC2576T150	CC2576T225
CC-2583	CASMC – Human Coronary Artery Smooth Muscle Cells	SmGM™ 2 BulletKit™	CC-2583W6	CC-2583W12	CC-2583W24	CC-2583W48	CC-0096	CC-2683	CC-0258	CC2583T150	CC2583T225
CC-2535	HAEC – Human Aortic Endothelial Cells	EGM™ 2 BulletKit™	CC-2535W6	CC-2535W12	CC-2535W24	CC-2535W48	CC-0132	CC-2635	CC-0222	CC2535T150	CC2535T225
CC-2585	HCAEC – Human Coronary Artery Endothelial Cells	EGM™ 2MV BulletKit™	CC-2585W6	CC-2585W12	CC-2585W24	CC-2585W48	CC-0188	CC-2685	CC-0261	CC2585T150	CC2585T225
CC-2545	HIAEC – Human Iliac Artery Endothelial Cells	EGM™ 2MV BulletKit™	CC-2545W6	CC-2545W12	CC-2545W24	CC-2545W48	CC-0095	CC-2645	CC-0291	CC2545T150	CC2545T225
CC-2551	HMEC – Human Mammary Epithelial Cells	MEGM™ BulletKit™	CC-2551W6	CC-2551W12	CC-2551W24	CC-2551W48	CC-0140	CC-2651	CC-0228	CC2551T150	CC2551T225
CC-7016	HMVEC-Bd – Human Bladder Microvascular Endothelial Cells	EGM™ 2MV BulletKit™	CC-7016W6	CC-7016W12	CC-7016W24	CC-7016W48	CC-7016W96	CC-7016T25	CC-7016T75	CC7016T150	CC7016T225
CC-7030	HMVEC-C – Human Cardiac Microvascular Endothelial Cells	EGM™ 2MV BulletKit™	CC-7030W6	CC-7030W12	CC-7030W24	CC-7030W48	CC-7030W96	CC-7030T25	CC-7030T75	CC-7030T150	CC-7030T225
CC-2543	HMVEC-dAd – Human Dermal Microvascular Endothelial Cells – Adult	EGM™ 2MV BulletKit™	CC-2543W6	CC-2543W12	CC-2543W24	CC-2543W48	CC-2543W96	CC-2643	CC-0207	CC2543T150	CC2543T225
CC-2516	HMVEC-dNeo – Human Dermal Microvascular Endothelial Cells – Neonatal, Pooled	EGM™ 2MV BulletKit™	CC-2516W6	CC-2516W12	CC-2516W24	CC-2516W48	CC-2516W96	CC-2616	CC-0288	CC2516T150	CC2516T225
CC-2505	HMVEC-dNeo – Human Dermal Microvascular Endothelial Cells – Neonatal, Single Donor	EGM™ 2MV BulletKit™	CC-2505W6	CC-2505W12	CC-2505W24	CC-2505W48	CC-0112	CC-2605	CC-0246	CC2505T150	CC2505T225
CC-2527	HMVEC-L – Human Lung Microvascular Endothelial Cells	EGM™ 2MV BulletKit™	CC-2527W6	CC-2527W12	CC-2527W24	CC-2527W48	CC-0184	CC-2627	CC-0264	CC2527T150	CC2527T225
CC-2530	HPAEC – Human Pulmonary Artery Endothelial Cells	EGM™ 2 BulletKit™	CC-2530W6	CC-2530W12	CC-2530W24	CC-2530W48	CC-0128	CC-2630	CC-0219	CC2530T150	CC2530T225
CC-7049	HPdLF – Human Periodontal Ligament Fibroblasts	SCGM™ BulletKit™	CC-7049W6	CC-7049W12	CC-7049W24	CC-7049W48	CC-7049W96	CC-7049T25	CC-7049T75	CC-7049T150	CC-7049T225
CC-2554	HRCE – Human Renal Cortical Epithelial Cells	REGM™ BulletKit™	CC-2554W6	CC-2554W12	CC-2554W24	CC-2554W48	CC-0172	CC-2654	CC-0270	CC2554T150	CC2554T225
CC-2556	HRE – Human Renal Epithelial Cells	REGM™ BulletKit™	CC-2556W6	CC-2556W12	CC-2556W24	CC-2556W48	CC-2556W96	CC-2556T25	CC-2556T75	CC2556T150	CC2556T225
CC-2580	HSMM – Human Skeletal Muscle Myoblasts	SkGM™ 2 BulletKit™	CC-2580W6	CC-2580W12	CC-2580W24	CC-2580W48	CC-2580W96	CC-2580T25	CC-2580T75	CC2580T150	CC2580T225
CC-2519	HUVEC – Human Umbilical Vein Endothelial Cells, Pooled	EGM™ BulletKit™	CC-2519W6	CC-2519W12	CC-2519W24	CC-2519W48	CC-2519W96	CC-2619	CC-0276	CC2519T150	CC2519T225
C2519A	HUVEC – Human Umbilical Vein Endothelial Cells, Pooled	EGM™ 2 BulletKit™	C2519AW6	C2519AW12	C2519AW24	C2519AW48	C2519AW96	C2519AT25	C2519AT75	C2519AT150	C2519AT225
C2517AS	HUVEC – Human Umbilical Vein Endothelial Cells, Pooled, S-Part	EGM™ 2 BulletKit™	C2517ASW6	C2517ASW12	C2517ASW24	C2517ASW48	C2517ASW96	C2517AST25	C2517AST75	C2517AST150	C2517AST225
CC-2517	HUVEC – Human Umbilical Vein Endothelial Cells, Single Donor	EGM™ BulletKit™	CC-2517W6	CC-2517W12	CC-2517W24	CC-2517W48	CC-0124	CC-2617	CC-0216	CC2517T150	CC2517T225
C2517A	HUVEC – Human Umbilical Vein Endothelial Cells, Single Donor	EGM™ 2 BulletKit™	C2517AW6	C2517AW12	C2517AW24	C2517AW48	C2517AW96	C2517AT25	C2517AT75	C2517AT150	C2517AT225
C2517AS	HUVEC – Human Umbilical Vein Endothelial Cells, Single Donor, S-part	EGM™ 2 BulletKit™	C2517ASW6	C2517ASW12	C2517ASW24	C2517ASW48	C2517ASW96	C2517AST25	C2517AST75	C2517AST150	C2517AST225
CC-2550	NHAC-kn – Human Articular Chondrocytes	CGM™ BulletKit™	CC-2550W6	CC-2550W12	CC-2550W24	CC-2550W48	CC-2550W96	CC-2550T25	CC-2550T75	CC2550T150	CC2550T225
CC-2565	NHA – Human Astrocytes	AGM™ BulletKit™	CC-2565W6	CC-2565W12	CC-2565W24	CC-2565W48	CC-0093	CC-2665	CC-0297	CC2565T150	CC2565T225
CC-2540	NHBE – Human Bronchial /Tracheal Epithelial Cells	BEGM™ BulletKit™	CC-2540W6	CC-2540W12	CC-2540W24	CC-2540W48	CC-0136	CC-2640	CC-0225	CC2540T150	CC2540T225
CC-2541	NHBE – Human Bronchial /Tracheal Epithelial Cells	BEGM™ BulletKit™	CC-2541W6	CC-2541W12	CC-2541W24	CC-2541W48	CC-0100	CC-2641	CC-0285	CC2541T150	CC2541T225
CC-2511	NHDF-Ad – Human Dermal Fibroblasts – Adult	FGM™ 2 BulletKit™	CC-2511W6	CC-2511W12	CC-2511W24	CC-2511W48	CC-0160	CC-2611	CC-0252	CC2511T150	CC2511T225
CC-2509	NHDF-Neo – Human Dermal Fibroblasts – Neonatal	FGM™ 2 BulletKit™	CC-2509W6	CC-2509W12	CC-2509W24	CC-2509W48	CC-0116	CC-2609	CC-0210	CC2509T150	CC2509T225
CC-2501	NHEK-Ad – Human Epidermal Keratinocytes – Adult	KGM™ Gold BulletKit™	CC-2501W6	CC-2501W12	CC-2501W24	CC-2501W48	CC-0104	CC-2601	CC-0201	CC2501T150	CC2501T225
192627	NHEK-Ad – Normal Human Epidermal Keratinocytes – Adult	KGM™ Gold BulletKit™	192627W6	192627W12	192627W24	192627W48	192627W96	192627T25	192627T75	192627T150	192627T225
CC-2503	NHEK-Neo – Normal Human Epidermal Keratinocytes – Neonatal	KGM™ BulletKit™	CC-2503W6	CC-2503W12	CC-2503W24	CC-2503W48	CC-0108	CC-2603	CC-0204	CC2503T150	CC2503T225
192907	NHEK-Neo – Normal Human Epidermal Keratinocytes – Neonatal	KGM™ Gold BulletKit™	192907W6	192907W12	192907W24	192907W48	192907W96	192907T25	192907T75	192907T150	192907T225
CC-2507	NHEK-Neo – Normal Human Epidermal Keratinocytes – Neonatal, Pooled	KGM™ BulletKit™	CC-2507W6	CC-2507W12	CC-2507W24	CC-2507W48	CC-0156	CC-2607	CC-0255	CC2507T150	CC2507T225
192906	NHEK-Neo – Normal Human Epidermal Keratinocytes – Neonatal, Pooled	KGM™ Gold BulletKit™	192906W6	192906W12	192906W24	192906W48	192906W96	192906T25	192906T75	192906T150	192906T225
CC-2504	NHEM-Neo – Normal Human Epidermal Melanocytes – Neonatal	MGM™ 4 BulletKit™	CC-2504W6	CC-2504W12	CC-2504W24	CC-2504W48	CC-2504W96	CC-2504T25	CC-2504T75	CC-2504T150	CC-2504T225
CC-2512	NHLF – Normal Human Lung Fibroblasts	FGM™ 2 BulletKit™	CC-2512W6	CC-2512W12	CC-2512W24	CC-2512W48	CC2512T150	CC-2612	CC-0282	CC2512T225	CC-0164
CC-2559	NHMC – Normal Human Mesangial Cells	MsGM™ BulletKit™	CC-2559W6	CC-2559W12	CC-2559W24	CC-2559W48	CC-0176	CC-2659	CC-0273	CC2559T150	CC2559T225
CC-2538	NH0st – Normal Human Osteoblasts	OGM™ BulletKit™	CC-2538W6	CC-2538W12	CC-2538W24	CC-2538W48	CC-2538W96	CC-2538T25	CC-2538T75	CC2538T150	CC2538T225
CC-2581	PASMC – Human Pulmonary Artery Smooth Muscle Cells	SmGM™ 2 BulletKit™	CC-2581W6	CC-2581W12	CC-2581W24	CC-2581W48	CC-0152	CC-2681	CC-0237	CC2581T150	CC2581T225
CC-2555	PrEC – Human Prostate Epithelial Cells	PrEGM™ BulletKit™	CC-2555W6	CC-2555W12	CC-2555W24	CC-2555W48	CC-0088	CC-2655	CC-0310	CC2555T150	CC2555T225
CC-2508	PrSC – Human Prostate Stromal Cells	SCGM™ BulletKit™	CC-2508W6	CC-2508W12	CC-2508W24	CC-2508W48	CC-2508W96	CC-2608	CC-2508T75	CC2508T150	CC2508T225
CC-2587	PrSMC – Human Prostate Smooth Muscle Cells	SmGM™ 2 BulletKit™	CC-2587W6	CC-2587W12	CC-2587W24	CC-2587W48	CC-2587W96	CC-2587T25	CC-2587T75	CC2587T150	CC2587T225
CC-2553	RPTEC – Human Renal Proximal Tubule Cells	REGM™ BulletKit™	CC-2553W6	CC-2553W12	CC-2553W24	CC-2553W48	CC-0168	CC-2653	CC-0267	CC2553T150	CC2553T225

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Continued

Part Number	Proliferating Cell Type Description	Recommended Media	6-well	12-well	24-well	48-well	96-well	T-25	T-75	T-150	T-225
Proliferating Cells – Normal											
CC-2547	SAEC – Human Small Airway Epithelial Cells	SAGM™ BulletKit™	CC-2547W6	CC-2547W12	CC-2547W24	CC-2547W48	CC-0094	CC-2647	CC-0294	CC2547T150	CC2547T225
CC-2561	SkMC – Human Skeletal Muscle Cells	SkGM™ BulletKit™	CC-2561W6	CC-2561W12	CC-2561W24	CC-2561W48	CC-0144	CC-2661	CC-0231	CC2561T150	CC2561T225
CC-2579	UASMC – Human Umbilical Artery Smooth Muscle Cells	SmGM™ 2 BulletKit™	CC-2579W6	CC-2579W12	CC-2579W24	CC-2579W48	CC-0192	CC-2679	CC-0243	CC2579T150	CC2579T225
CC-2562	UtSMC – Human Uterine Smooth Muscle Cells	SmGM™ 2 BulletKit™	CC-2562W6	CC-2562W12	CC-2562W24	CC-2562W48	CC-0089	CC-2662	CC-0313	CC2562T150	CC2562T225
194987	H-RPE – Human Retinal Pigment Epithelial Cells	RtEGM™ BulletKit™	194987W6	194987W12	194987W24	194987W48	194987W96	194987T25	194987T75	194987T150	194987T225
CC-2586	NHEM-Ad – Normal Human Melanocytes – Adult	MGM™ 4 BulletKit™	CC-2586W6	CC-2586W12	CC-2586W24	CC-2586W48	CC-2586W96	CC-2586T25	CC-2586T75	CC-2586T150	CC-2586T225
CC-2902	InMyoFib – Intestinal Myofibroblasts	SmGM™ 2 BulletKit™	CC-2902W6	CC-2902W12	CC-2902W24	CC-2902W48	CC-2902W96	CC-2902T25	CC-2902T75	CC-2902T150	CC-2902T225
CC-2903	NHCF-A – Normal Human Cardiac Fibroblasts – Atrial	FGM™ 3 BulletKit™	CC-2903W6	CC-2903W12	CC-2903W24	CC-2903W48	CC-2903W96	CC-2903T25	CC-2903T75	CC-2903T150	CC-2903T225
CC-2904	NHCF-V – Normal Human Cardiac Fibroblasts – Ventricular	FGM™ 3 BulletKit™	CC-2904W6	CC-2904W12	CC-2904W24	CC-2904W48	CC-2904W96	CC-2904T25	CC-2904T75	CC-2904T150	CC-2904T225

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Quick Reference Guide

Continued

Quick Reference Guide

Continued

Part Number	Proliferating Cell Type Description	Recommended Media	6-well	12-well	24-well	48-well	96-well	T-25	T-75	T-150	T-225
Proliferating Cells – Diseased											
194843	D-HLF-CF – Diseased Human Lung Fibroblasts – Cystic Fibrosis	FGM™ 2 BulletKit™	194843W6	194843W12	194843W24	194843W48	194843W96	194843T25	194843T75	194843T150	194843T225
194850	D-BSMC-As – Diseased Bronchial Smooth Muscle Cells – Asthma	SmGM™ 2 BulletKit™	194850W6	194850W12	194850W24	194850W48	194850W96	194850T25	194850T75	194850T150	194850T225
194911	D-HBE-As – Diseased Human Bronchial/Tracheal Epithelial Cells – Asthma	BEGM™ BulletKit™	194911W6	194911W12	194911W24	194911W48	194911W96	194911T25	194911T75	194911T150	194911T225
194912	D-HLF-As – Diseased Human Lung Fibroblast Cells – Asthma	FGM™ 2 BulletKit™	194912W6	194912W12	194912W24	194912W48	194912W96	194912T25	194912T75	194912T150	194912T225
195274	D-BSMC-COPD – Diseased Bronchial Smooth Muscle Cells – COPD	SmGM™ 2 BulletKit™	195274W6	195274W12	195274W24	195274W48	195274W96	195274T25	195274T75	195274T150	195274T225
195275	D-HBE-COPD – Diseased Human Bronchial/Tracheal Epithelial Cells – COPD	BEGM™ BulletKit™	195275W6	195275W12	195275W24	195275W48	195275W96	195275T25	195275T75	195275T150	195275T225
195277	D-HLF-COPD – Diseased Human Lung Fibroblast Cell – COPD	FGM™ 2 BulletKit™	195277W6	195277W12	195277W24	195277W48	195277W96	195277T25	195277T75	195277T150	195277T225
196979	D-HBEC-CF – Diseased Human Bronchial/Tracheal Epithelial Cells – Cystic Fibrosis	BEGM™ BulletKit™	196979W6	196979W12	196979W24	196979W48	196979W96	196979T25	196979T75	196979T150	196979T225
196980	D-HBSMC-CF – Diseased Human Bronchial Smooth Muscle Cells – Cystic Fibrosis	SmGM™ 2 BulletKit™	196980W6	196980W12	196980W24	196980W48	196980W96	196980T25	196980T75	196980T150	196980T225
CC-2900	D-HSMM – Diseased Human Skeletal Muscle Myoblasts – Diabetes Type I	SkGM™ 2 BulletKit™	CC-2900W6	CC-2900W12	CC-2900W24	CC-2900W48	CC-2900W96	CC-2900T25	CC-2900T75	CC-2900T150	CC-2900T225
CC-2901	D-HSMM – Diseased Human Skeletal Muscle Myoblasts – Diabetes Type II	SkGM™ 2 BulletKit™	CC-2901W6	CC-2901W12	CC-2901W24	CC-2901W48	CC-2901W96	CC-2901T25	CC-2901T75	CC-2901T150	CC-2901T225
CC-2913	D-PASMC – Diseased Human Pulmonary Artery Smooth Muscle – Diabetes Type II	SmGM™ 2 BulletKit™	CC-2913W6	CC-2913W12	CC-2913W24	CC-2913W48	CC-2913W96	CC-2913T25	CC-2913T75	CC-2913T150	CC-2913T225
CC-2914	D-AoSMC – Diseased Human Aortic Smooth Muscle – Diabetes Type I	SmGM™ 2 BulletKit™	CC-2914W6	CC-2914W12	CC-2914W24	CC-2914W48	CC-2914W96	CC-2914T25	CC-2914T75	CC-2914T150	CC-2914T225
CC-2915	D-PASMC – Diseased Human Pulmonary Artery Smooth Muscle Cells – Diabetes Type I	SmGM™ 2 BulletKit™	CC-2915W6	CC-2915W12	CC-2915W24	CC-2915W48	CC-2915W96	CC-2915T25	CC-2915T75	CC-2915T150	CC-2915T225
CC-2916	D-AoSMC – Diseased Human Aortic Smooth Muscle – Diabetes Type II	SmGM™ 2 BulletKit™	CC-2916W6	CC-2916W12	CC-2916W24	CC-2916W48	CC-2916W96	CC-2916T25	CC-2916T75	CC-2916T150	CC-2916T225
CC-2917	D-CASMC – Diseased Human Coronary Artery Smooth Muscle – Diabetes Type I	SmGM™ 2 BulletKit™	CC-2917W6	CC-2917W12	CC-2917W24	CC-2917W48	CC-2917W96	CC-2917T25	CC-2917T75	CC-2917T150	CC-2917T225
CC-2918	D-CASMC – Diseased Human Coronary Artery Smooth Muscle – Diabetes Type II	SmGM™ 2 BulletKit™	CC-2918W6	CC-2918W12	CC-2918W24	CC-2918W48	CC-2918W96	CC-2918T25	CC-2918T75	CC-2918T150	CC-2918T225
CC-2919	D-HAEC – Diseased Human Aortic Endothelial – Diabetes Type I	EGM™ 2 BulletKit™	CC-2919W6	CC-2919W12	CC-2919W24	CC-2919W48	CC-2919W96	CC-2919T25	CC-2919T75	CC-2919T150	CC-2919T225
CC-2920	D-HAEC – Diseased Human Aortic Endothelial – Diabetes Type II	EGM™ 2 BulletKit™	CC-2920W6	CC-2920W12	CC-2920W24	CC-2920W48	CC-2920W96	CC-2920T25	CC-2920T75	CC-2920T150	CC-2920T225
CC-2921	D-HCAEC – Diseased Human Coronary Artery Endothelial Cells – Diabetes Type I	EGM™ 2MV BulletKit™	CC-2921W6	CC-2921W12	CC-2921W24	CC-2921W48	CC-2921W96	CC-2921T25	CC-2921T75	CC-2921T150	CC-2921T225
CC-2922	D-HCAEC – Diseased Human Coronary Artery Endothelial – Diabetes Type II	EGM™ 2MV BulletKit™	CC-2922W6	CC-2922W12	CC-2922W24	CC-2922W48	CC-2922W96	CC-2922T25	CC-2922T75	CC-2922T150	CC-2922T225
CC-2923	D-HPAEC – Diseased Human Pulmonary Artery Endothelial Cells – Diabetes Type I	EGM™ 2 BulletKit™	CC-2923W6	CC-2923W12	CC-2923W24	CC-2923W48	CC-2923W96	CC-2923T25	CC-2923T75	CC-2923T150	CC-2923T225
CC-2924	D-HPAEC – Diseased Human Pulmonary Artery Endothelial Cells – Diabetes Type II	EGM™ 2 BulletKit™	CC-2924W6	CC-2924W12	CC-2924W24	CC-2924W48	CC-2924W96	CC-2924T25	CC-2924T75	CC-2924T150	CC-2924T225
CC-2925	D-RPTEC – Diseased Human Renal Proximal Tubule Epithelial Cells – Diabetes Type II	REGM™ BulletKit™	CC-2925W6	CC-2925W12	CC-2925W24	CC-2925W48	CC-2925W96	CC-2925T25	CC-2925T75	CC-2925T150	CC-2925T225
CC-2926	D-HEK-Ad – Diseased Human Adult Epidermal Keratinocytes – Diabetes Type II	KGM™ Gold BulletKit™	CC-2926W6	CC-2926W12	CC-2926W24	CC-2926W48	CC-2926W96	CC-2926T25	CC-2926T75	CC-2926T150	CC-2926T225
CC-2927	D-HMVEC – Diseased Cardiac Microvascular Endothelial Cells – Diabetes Type I	EGM™ 2MV BulletKit™	CC-2927W6	CC-2927W12	CC-2927W24	CC-2927W48	CC-2927W96	CC-2927T25	CC-2927T75	CC-2927T150	CC-2927T225
CC-2928	D-HMVEC – Diseased Cardiac Microvascular Endothelial Cells – Diabetes Type II	EGM™ 2MV BulletKit™	CC-2928W6	CC-2928W12	CC-2928W24	CC-2928W48	CC-2928W96	CC-2928T25	CC-2928T75	CC-2928T150	CC-2928T225
CC-2929	D-HMVEC – Diseased Human Dermal Microvascular Endothelial Cells – Diabetes Type I	EGM™ 2MV BulletKit™	CC-2929W6	CC-2929W12	CC-2929W24	CC-2929W48	CC-2929W96	CC-2929T25	CC-2929T75	CC-2929T150	CC-2929T225
CC-2930	D-HMVEC – Diseased Human Dermal Microvascular Endothelial Cells – Diabetes Type II	EGM™ 2MV BulletKit™	CC-2930W6	CC-2930W12	CC-2930W24	CC-2930W48	CC-2930W96	CC-2930T25	CC-2930T75	CC-2930T150	CC-2930T225
CC-2932	D-SAEC-As – Diseased Small Airway Epithelial Cells – Asthma	BEGM™ BulletKit™	CC-2932W6	CC-2932W12	CC-2932W24	CC-2932W48	CC-2932W96	CC-2932T25	CC-2932T75	CC-2932T150	CC-2932T225
CC-2933	D-SAEC – Diseased Small Airway Epithelial Cells – Cystic Fibrosis	BEGM™ BulletKit™	CC-2933W6	CC-2933W12	CC-2933W24	CC-2933W48	CC-2933W96	CC-2933T25	CC-2933T75	CC-2933T150	CC-2933T225
CC-2934	D-SAEC – Diseased Small Airway Epithelial Cells – COPD	BEGM™ BulletKit™	CC-2934W6	CC-2934W12	CC-2934W24	CC-2934W48	CC-2934W96	CC-2934T25	CC-2934T75	CC-2934T150	CC-2934T225

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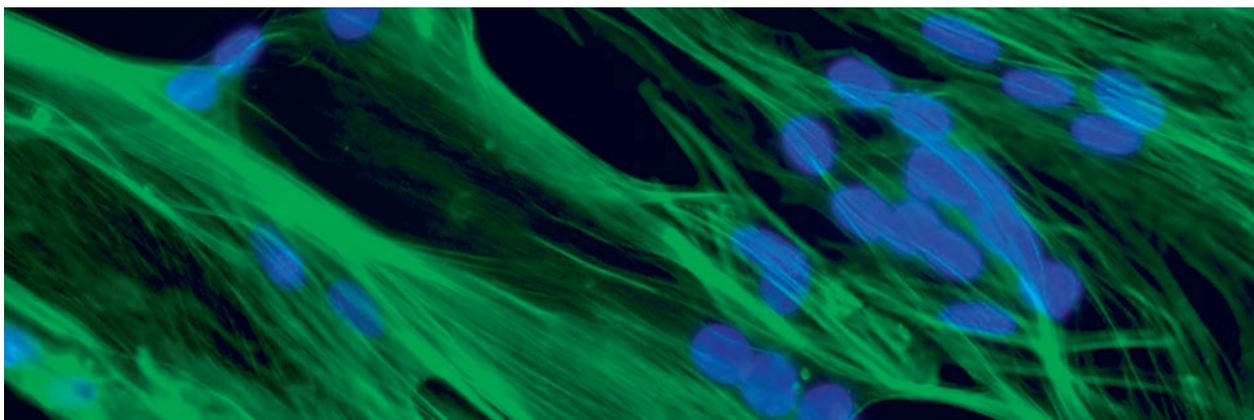
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Notes

2

Clonetics™ Human Primary Cells and Media

In vivo relevance. *In vitro* results.



2

Primary Cells and Media / Clonetics™ Human Primary Cells and Media

Clonetics™ Human Primary Cells and Media

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Introduction

Clonetics™ Human Primary Cells and Media include cells that are derived from normal and some diseased human tissues and test negative for HIV-1, Hepatitis B and C, mycoplasma and sterility. Immuno and special staining protocols, as well as characteristic morphology are used to characterize the cells and authenticate their identity. A Certificate of Analysis is available for each cryopreserved cell type and lot. The cell performance is guaranteed when the optimized system comprised of Clonetics™ Cells, Media, Reagents, and Protocol is used. Most cells are available cryopreserved, proliferating (in either flasks or plates), or as pellets in RNALater®, a reagent that inactivates RNases and stabilizes RNA within unfrozen tissues and cells.

Clonetics™ Media Kits have been specially designed to support the growth of these cells. These Media BulletKits™ are comprised of basal media and SingleQuots™ Kits of growth factors and supplements. For detailed information about these media systems, please see pages 414–423.

■ General Cell and Media Information

- Proliferating cells are offered in the following formats, flasks (T-25, T-75, T-150, T-225) and multiwell plates (6, 12, 24, 48, and 96-wells). Contact Customer Service for order placement and delivery schedules, or Scientific Support for any other questions regarding alternative formats for cell culture reagents
- Cell pellets in RNALater® are available as well with 10 million cells/pellet, contact Customer Service for order placement
- Clonetics™ Cells are guaranteed to perform to our release criteria when cultured with the provided protocol in our recommended media and reagents
- Media systems are offered as BulletKits™ (basal medium and SingleQuots™ Kit) to provide the flexibility to manipulate media components specific to your application, and a longer shelf life prior to use

✓ General Ordering and Shipping Information

Cryopreserved cells and media products are normally shipped Monday – Thursday for next day delivery. Saturday and Monday deliveries are available upon special request.

Proliferating cell orders are processed every other week, turn around times range from two to four weeks from the time the order is placed.

Cell pellet orders require 7–10 production days. Please plan accordingly.



Bladder Cells and Media

The bladder serves as a reservoir for water soluble byproducts generated during cell metabolism. Soluble wastes are excreted through the urinary system, which consists of the kidneys, ureters, urinary bladder, and urethra.

■ Source

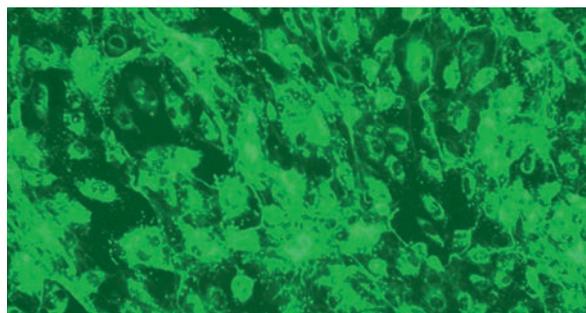
- Human bladder smooth muscle cells and human bladder microvascular endothelial cells both isolated from specific tissues layers surrounding the bladder

■ Applications

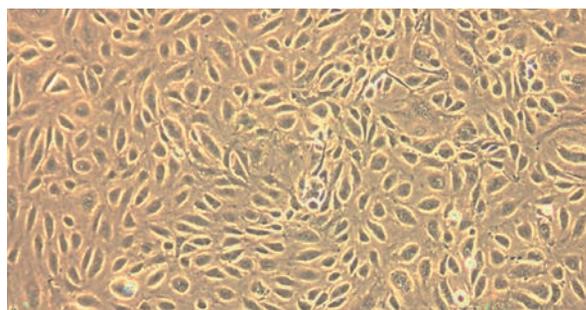
- Overactive bladder
- Cancer
- Urologic disease

■ Cell Testing and Specifications

- BdSMC stain positive for smooth muscle α -actin and negative for von Willebrand Factor
- HMVEC-Bd stain positive for von Willebrand Factor and LDL and negative for smooth muscle α -actin
- Both cell types are guaranteed through ten population doublings when using Clonetics™ Media and Reagents



HMVEC-Bd culture stained for von Willebrand Factor (green)



HMVEC-Bd at >90% confluency

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
BdSMC	Bladder smooth muscle	SmGM™ 2 BulletKit™	3rd passage	4th passage	3,500 cells/cm ²	6 to 9 days
HMVEC-Bd	Bladder microvascular endothelial	EGM™ 2MV BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	6 to 9 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2533	CC-2533	BdSMC – Human Bladder Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-7016	CC-7016	HMVEC-Bd – Human Bladder Microvascular Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

More ordering information on the next page.

Bladder Cells and Media

Continued

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3182	CC-3182	SmGM™ 2 Smooth Muscle Cell Growth Medium -2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4149	CC-4149	SmGM™ 2 Smooth Muscle Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
	CC-3182 / 6	SmGM™ 2 Smooth Muscle Cell Growth Medium-2 BulletKit™	Six pack, includes basal medium and SingleQuots™ Kit	Kit
CC-3181	CC-3181	SmBM™ Smooth Muscle Cell Basal Medium		500 mL
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each
	CC-3202 / 6	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Six pack, includes basal medium and SingleQuots™ Kit	Kit
CC-3202	CC-3202	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3156	CC-3156	EBM™ 2 Endothelial Cell Basal Medium-2		500 mL
CC-4147	CC-4147	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit

 See pages 414–423.

Related Products	Page
Nucleofector™ Kits for Primary Mammalian Smooth Muscle Cells	235
Nucleofector™ Kits for Primary Mammalian Endothelial Cells	224

Cardiac Cells and Media

Cardiac cells are used to study the functions and general pathophysiology of the human cardiovascular system. Some of these cell types are available from normal, Type I and Type II diabetic donors.

■ Source

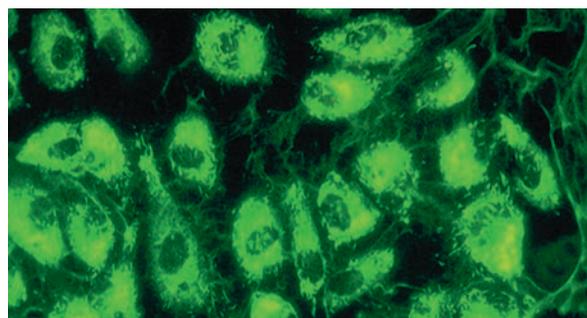
- Human aorta adventitial fibroblasts isolated from tunica external of ascending or descending aorta
- Cardiac fibroblasts isolated from atrial and ventricular cardiac tissue
- Endothelial cells isolated from human aorta, and coronary artery, and small vessel endothelial cells from ventricle tissue
- Smooth muscle cells isolated from aorta and coronary artery

■ Applications

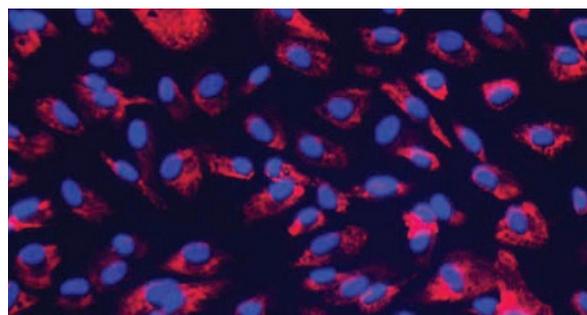
- Arrhythmia
- Cardiomyopathy
- Heart failure
- Preventative cardiology
- Vascular research

■ Cell Testing and Specifications

- **Endothelial cells** – Positive for acetylated low density lipoprotein uptake, and von Willebrand Factor Expression/Factor VIII. Up to 15 population doublings guaranteed when using Clonetics™ Media and Reagents
- **Fibroblasts** – Cardiac fibroblasts stain positive for collagen I and negative for von Willebrand factor VIII and are guaranteed through five population doublings when using Clonetics™ Media and Reagents, AoAF stain negative for α -actin and are guaranteed through ten population doublings when using Clonetics™ Media and Reagents
- **Smooth muscle cells** – Stain positive for α -actin and negative for von Willebrand Factor after differentiation, and are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents



HCAEC culture stained for von Willebrand Factor (green)



Human cardiac fibroblasts (ventricle) at fifth passage stained for collagen (red) and counterstained with DAPI (blue) (20x)

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
HAEC*	Aortic endothelial	EGM™ 2 BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	5 to 9 days
HCAEC*	Coronary artery	EGM™ 2MV BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	5 to 9 days
HMVEC-C*	Cardiac microvascular	EGM™ 2MV BulletKit™	3rd passage	n/a	5,000 cells/cm ²	5 to 9 days
AoAF	Aortic adventitial fibroblasts	SCGM™ BulletKit™	2nd passage	3rd passage	3,500 cells/cm ²	6 to 9 days
NHCF-A	Atrial cardiac fibroblasts	FGM™-3 BulletKit™	2nd passage	3rd passage	5,000 cells/cm ²	6 to 9 days
NHCF-V	Ventricle cardiac fibroblasts	FGM™-3 BulletKit™	2nd passage	3rd passage	5,000 cells/cm ²	6 to 9 days
AoSMC*	Aortic smooth muscle	SmGM™ 2 BulletKit™	3rd passage	4th or 5th passage	3,500 cells/cm ²	6 to 10 days
CASMC*	Coronary artery	SmGM™ 2 BulletKit™	3rd passage	4th or 5th passage	3,500 cells/cm ²	6 to 10 days
HPAEC*	Pulmonary Artery Endothelial	EGM™ 2 BulletKit™	3rd passage	4th passage	5000 cells/cm ²	5 to 9 days
PASMC*	Pulmonary Artery Smooth Muscle	SmGM™ 2 BulletKit™	3rd passage	4th or 5th passage	3,500 cells/cm ²	6 to 10 days

* Cells also available from Type I and Type II diabetic donors

Cardiac Cells and Media

Continued

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Normal Cells				
CC-2535	CC-2535	HAEC – Human Aortic Endothelial Cells	Cryopreserved, in EGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2530	CC-2530	HPAEC – Human Pulmonary Artery Endothelial Cells	Cryopreserved, in EGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2585	CC-2585	HCAEC – Human Coronary Artery Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-7030	CC-7030	HMVEC-C – Human Cardiac Microvascular Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2581	CC-2581	HPASMC – Human Pulmonary Artery Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-7014	CC-7014	AoAF – Human Aortic Adventitial Fibroblasts	Cryopreserved, in SCGM™ BulletKit™	≥500,000 cells/vial
CC-2903	CC-2903	NHCF-A – Normal Human Atrial Cardiac Fibroblasts	Cryopreserved, in FGM™ 3 BulletKit™	≥500,000 cells/vial
CC-2904	CC-2904	NHCF-V – Normal Human Ventricular Cardiac Fibroblasts	Cryopreserved, in FGM™ 3 BulletKit™	≥500,000 cells/vial
CC-2571	CC-2571	AoSMC – Human Aortic Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2583	CC-2583	CASMC – Human Coronary Artery Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
Diseased Cells				
CC-2919	CC-2919	D-HAEC – Diseased Human Aortic Endothelial – Diabetes Type I	Cryopreserved, in EGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2920	CC-2920	D-HAEC – Diseased Human Aortic Endothelial – Diabetes Type II	Cryopreserved, in EGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2921	CC-2921	D-HCAEC – Diseased Human Coronary Artery Endothelial Cells – Diabetes Type I	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2922	CC-2922	D-HCAEC – Diseased Human Coronary Artery Endothelial Cells – Diabetes Type II	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2923	CC-2923	D-HPAEC – Diseased Human Pulmonary Artery Endothelial Cells – Diabetes Type I	Cryopreserved, in EGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2924	CC-2924	D-HPAEC – Diseased Human Pulmonary Artery Endothelial Cells – Diabetes Type II	Cryopreserved, in EGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2927	CC-2927	D-HMVEC-C – Diseased Cardiac Microvascular Endothelial Cells – Diabetes Type I	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2928	CC-2928	D-HMVEC-C – Diseased Cardiac Microvascular Endothelial Cells – Diabetes Type II	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2914	CC-2914	D-AoSMC – Diseased Human Aortic Smooth Muscle – Diabetes Type I	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2916	CC-2916	D-AoSMC – Diseased Human Aortic Smooth Muscle – Diabetes Type II	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2917	CC-2917	D-CASMC – Diseased Human Coronary Artery Smooth Muscle – Diabetes Type I	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2918	CC-2918	D-CASMC – Diseased Human Coronary Artery Smooth Muscle – Diabetes Type II	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2915	CC-2915	D-PASMC – Diseased Human Pulmonary Artery Smooth Muscle Cells – Diabetes Type I	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2913	CC-2913	D-PASMC – Diseased Human Pulmonary Artery Smooth Muscle Cells – Diabetes Type II	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial

Cardiac Cells and Media

Continued

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3156	CC-3156	EBM™ 2 Endothelial Cell Basal Medium-2		500 mL
CC-3162	CC-3162	EGM™ 2 Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4176	CC-4176	EGM™ 2 Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3131	CC-3131	FBM™ Fibroblast Basal Medium		500 mL
CC-4525	CC-4525	FGM™ 3 Cardiac Fibroblast Growth Medium-3 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-4526	CC-4526	FGM™ 3 Cardiac Fibroblast Growth Medium-3 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3202	CC-3202	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4147	CC-4147	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3181	CC-3181	SmBM™ Smooth Muscle Cell Basal Medium		500 mL
CC-3182	CC-3182	SmGM™ 2 Smooth Muscle Cell Growth Medium -2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4149	CC-4149	SmGM™ 2 Smooth Muscle Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3204	CC-3204	SCBM™ Stromal Cell Basal Medium		500 mL
CC-3205	CC-3205	SCGM™ Stromal Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4181	CC-4181	SCGM™ Stromal Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

NOTE: Normal cell media is recommended for related disease cell types.

Related Products	Page
CytoSMART™ System	268
RAFT™ 3D Culture System	272
Nucleofector™ Kits for Mammalian Endothelial Cells	224
Nucleofector™ Kits for Mammalian Fibroblasts	230
Nucleofector™ Kits for Human Aortic Smooth Muscle Cells	233

Dermal Cells and Media

We offer a variety of cell types isolated from dermal tissue from normal, Type I, and Type II diabetic donors.

■ Source

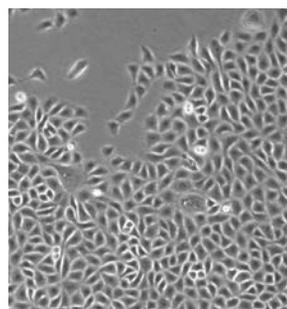
- Small vessel endothelial cells derived from dermal microvascular tissue
- Adult human dermal fibroblasts derived from adult skin tissue and neonatal human dermal fibroblasts derived from neonatal foreskins
- Keratinocytes derived from human neonatal foreskins and adult skin tissue
- Melanocytes derived from human neonatal foreskins and adult skin tissue

■ Applications

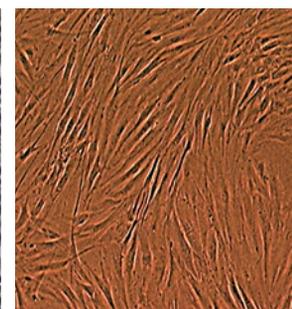
- | | |
|---------------------------------|--|
| – Epithelial cell model | – Cancer |
| – Wound healing | – Drug efficacy |
| – Burn therapy | – Immunology |
| – Dermatology disorders | – Fibrosis |
| – Inflammation | – Angiogenesis |
| – Drug uptake or drug discovery | – Oncology |
| – Cell-to-cell junctions | – Cell signaling |
| – Cell differentiation | – Cell adhesion |
| – Viral-induced transformation | – Pigmentation
[<i>melanogenesis</i>] |

■ Cell Testing and Specifications

- **Endothelial cells** – Test positive for acetylated low density lipoprotein uptake and positive for von Willebrand Factor Expression/Factor VIII. Up to 15 population doublings are guaranteed for normal cells when using Clonetics™ Media and Reagents
- **Fibroblasts** – NHDF are characterized by morphological observation throughout serial passage and are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents
- **Keratinocytes** – Are characterized by morphological observation throughout serial passage and are guaranteed through 18–20 population doublings for normal adult and neonatal cells, respectively, when using Clonetics™ Media and Reagents



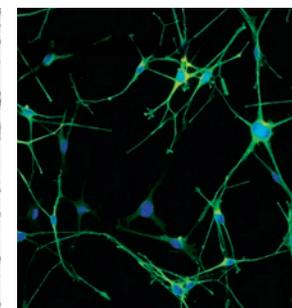
KGM™ Gold Adult NHEK cells in passage 2



NHDF-excellent, uniform morphology



NHEM stained for L-dopa



NHEM stained for Mel-5 (green) and counter stained for DAPI (blue)

- **Melanocytes** – Are characterized for purity through immunofluorescent labeling of Mel-5 (gp75/TRP-1) with most cultures exceeding 85% Mel-5 labeling. They are also tested for function – 70% of the cells in culture converting L-dopa into dopa-melanin. Their morphology and proliferative capacity is monitored throughout serial passage after recovery from cryopreservation

Ordering information on the next page.

Dermal Cells and Media

Continued

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
HMVEC-dAd	Adult dermal microvascular	EGM™ 2MV BulletKit™	3rd passage	4th or 5th passage	5,000 cells/cm ²	5 to 9 days
HMVEC-dBIneo	Neonatal dermal blood microvascular	EGM™ 2MV BulletKit™	3rd passage	4th or 5th passage	5,000 cells/cm ²	4 to 7 days
HMVEC-dLyAd	Adult dermal lymphatic microvascular	EGM™ 2MV BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	4 to 7 days
HMVEC-dNeo	Neonatal dermal microvascular	EGM™ 2MV BulletKit™	3rd passage	4th or 5th passage	5,000 cells/cm ²	5 to 9 days
NHDF-Ad	Adult dermal fibroblasts	FGM™ 2 BulletKit™	1st passage	2nd passage	3,500 cells/cm ²	6 to 9 days
NHDF-Neo	Neonatal dermal fibroblasts	FGM™ 2 BulletKit™	1st passage	2nd passage	3,500 cells/cm ²	6 to 9 days
NHEK-Ad	Epidermal keratinocytes, adult	KGM™ Gold BulletKit™	1st passage	2nd passage	3,500 cells/cm ²	5 to 9 days
NHEK-Neo	Epidermal keratinocytes, neonatal	KGM™ Gold BulletKit™	1st passage	2nd passage	3,500 cells/cm ²	5 to 9 days
NHEK-Neo Pooled	Epidermal keratinocytes, neonatal, pooled	KGM™ Gold BulletKit™	1st passage	2nd passage	3,500 cells/cm ³	6 to 9 days
NHEM-Neo	Neonatal normal human epidermal melanocytes	MGM™ 4 BulletKit™	3rd passage	4th passage	10,000 cells/cm ²	9 to 14 days
NHEM-Ad	Adult normal human epidermal melanocytes	MGM™ 4 BulletKit™ + ET-3 Supplement	2nd passage	3rd passage	10,000 cells/cm ²	9 to 14 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Normal Cells				
CC-2505	CC-2505	HMVEC-dNeo – Human Dermal Microvascular Endothelial Cells – Neonatal	Cryopreserved, in EGM™ 2MV BulletKit™, single donor	≥500,000 cells/vial
CC-2543	CC-2543	HMVEC-dAd – Human Dermal Microvascular Endothelial Cells – Adult	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2813	CC-2813	HMVEC-dBI-Neo – Human Dermal Blood Microvascular Endothelial Cells – Neonatal	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2509	CC-2509	NHDF-Neo – Normal Human Dermal Fibroblasts – Neonatal	Cryopreserved, in FGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2511	CC-2511	NHDF-Ad – Normal Human Dermal Fibroblasts – Adult	Cryopreserved, in FGM™ 2 BulletKit™	≥500,000 cells/vial
192627	192627	NHEK-Ad™ Normal Human Epidermal Keratinocytes™ Adult	Cryopreserved, in KGM™ Gold BulletKit™, single donor	≥500,000 cells/vial
192627B	192627B	Adult Keratinocyte Cell Culture Kit	Consists of Catalog numbers 192627 and 192060	Kit
CC-2507	CC-2507	NHEK-Neo – Normal Human Epidermal Keratinocytes – Neonatal	Cryopreserved, in KGM™ BulletKit™, pooled	≥500,000 cells/vial
192906	192906	NHEK-Neo – Normal Human Epidermal Keratinocytes – Neonatal	Cryopreserved, in KGM™ Gold BulletKit™, pooled	≥500,000 cells/vial
192907	192907	NHEK-Neo – Normal Human Epidermal Keratinocytes – Neonatal	Cryopreserved, in KGM™ Gold BulletKit™	≥500,000 cells/vial
CC-2503	CC-2503	NHEK-Neo – Normal Human Epidermal Keratinocytes – Neonatal	Cryopreserved, in KGM™ Gold BulletKit™	≥500,000 cells/vial
CC-2504	CC-2504	NHEM-Neo – Normal Human Epidermal Melanocytes – Neonatal	Cryopreserved, in MGM™ 4 BulletKit™	≥500,000 cells/vial
CC-2586	CC-2586	NHEM-Ad – Normal Human Epidermal Melanocytes – Adult	Cryopreserved, in MGM™ 4 BulletKit™	≥500,000 cells/vial
Diseased Cells				
CC-2926	CC-2926	D-HEK-Ad – Diseased Human Adult Epidermal Keratinocytes – Diabetes Type II	Cryopreserved, in KGM™ Gold BulletKit™	≥500,000 cells/vial
CC-2929	CC-2929	D-HMVEC-dAD – Diseased Human Dermal Microvascular Endothelial Cells – Diabetes Type I	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2930	CC-2930	D-HMVEC-dAD – Diseased Human Dermal Microvascular Endothelial Cells – Diabetes Type II	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Dermal Cells and Media

Continued

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3202	CC-3202	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4147	CC-4147	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3131	CC-3131	FBM™ Fibroblast Basal Medium		500 mL
CC-3132	CC-3132	FGM™ 2 Fibroblast Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4126	CC-4126	FGM™ 2 Fibroblast Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
192060	192060	KGM™ Gold Keratinocyte Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
192151	192151	KBM™ Gold Keratinocyte Basal Medium		500 mL
192152	192152	KGM™ Gold Keratinocyte Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
195769	195769	KGM™ Gold Keratinocyte Growth Medium BulletKit™	Calcium-free, includes basal medium and SingleQuots™ Kit	Kit
195130	195130	KBM™ Gold Keratinocyte Basal Medium	Without phenol red or calcium	500 mL
CC-4455	CC-4455	TheraPEAK™ KGM™ CD Keratinocyte Growth Medium BulletKit™	Chemically defined, includes basal medium and SingleQuots™ Kit	Kit
CC-4456	CC-4456	KGM™ CD Keratinocyte Growth Medium SingleQuots™ Supplements and Growth Factors		Kit
CC-3255	CC-3255	KBM™ CD Keratinocyte Basal Medium	Chemically defined	500 mL
CC-3249	CC-3249	MGM™ 4 Melanocyte Growth Medium-4 BulletKit	Includes basal medium and SingleQuots™ Kit	Kit
CC-3250	CC-3250	MBM™ 4 Melanocyte Basal Medium-4		500 mL
CC-4435	CC-4435	MGM™ 4 Melanocyte Growth Medium-4 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
17-516F	BE17-516F	Phosphate Buffered Saline (1X)	6.7 mM [PO ₄] without calcium or magnesium	500 mL
CC-5012	CC-5012	Trypsin/EDTA Solution		100 mL
17-711E	BE17-711E	Versene® (EDTA), 0.02%	0.2 g/L Ethylenediaminetetraacetic acid (0.53 mM) in DPBS, without calcium or magnesium	100 mL
CC-5002	CC-5002	Trypsin Neutralizing Solution		100 mL
CC-4510	CC-4510	Endothelin-3 [ET-3] Growth Supplement		130 µg
10-547F	BE10-547F	Hank's Buffered Saline Solution	Without phenol red, calcium or magnesium	500 mL

 See pages 414–423.

 Endothelial cells must be cultured in their isolation medium for best results.

NOTE: Normal cell media is recommended for related disease cell types.

Related Products	Page
CytoSMART™ System	268
RAFT™ 3D Culture System	272
Nucleofector™ Kits for Primary Human Keratinocytes	219
Nucleofector™ Kits for Primary Mammalian Endothelial Cells	224
Nucleofector™ Kits for Human Dermal Fibroblasts	228
Nucleofector™ Kits for Human Melanocytes	220

Large Vessel Endothelial Cells and Media

Endothelial cells line the inside surface of blood vessels, heart, lymphatic vessels, body cavities, and other organs of normal human tissue.

We offer many of these cell types from normal, Type I, and Type II diabetic donors.

■ Source

- Large vessel endothelial cells are isolated from the human aorta, umbilical artery and vein, and coronary, iliac, and pulmonary arteries

■ Applications

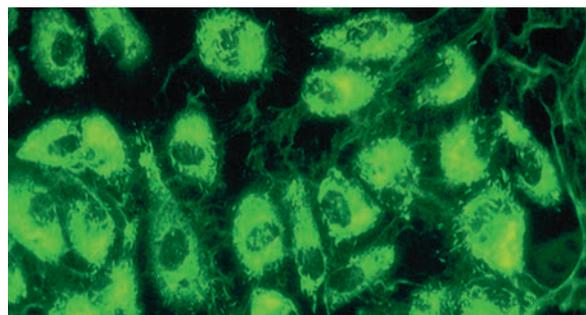
- Atherosclerosis
- Arteriosclerosis
- Drug uptake or drug discovery
- Wound healing
- Angiogenesis
- Inflammation
- Oncology

■ Cell Testing and Specifications

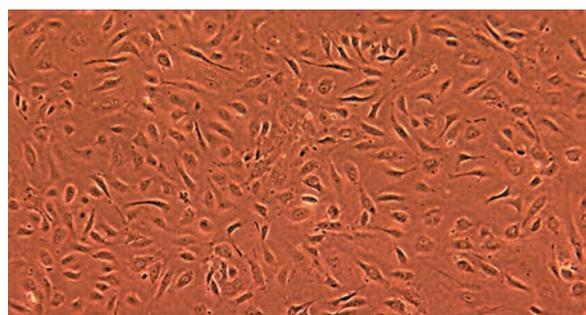
- **Endothelial cells** – Test positive for acetylated low density lipoprotein uptake; positive for von Willebrand Factor Expression/Factor VIII. HUVEC test $\geq 90\%$ double positive for CD31/CD105 markers by flow cytometry. Up to 15 population doublings are guaranteed with normal cells when using Clonetics™ Media and Reagents. Up to 5 population doublings are guaranteed for HUVEC-XL when using Clonetics™ Media and Reagents
- **Prescreened HUVECs** – Isolated in EGM™ 2 medium, pooled from 3 to 5 donors, and tested for angiogenesis/endothelial health related markers: Axl, eNOS, Tie-2, and VEGFr2

■ HUVECs cultured in EGM™ Plus Growth Media Bulletkit™

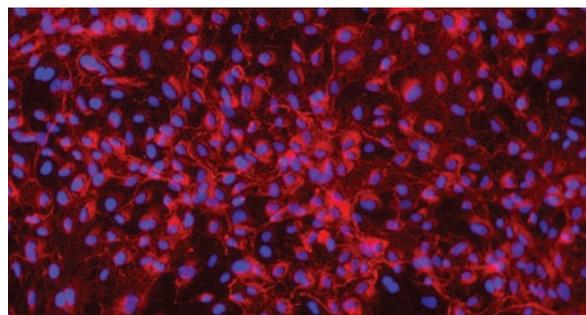
Our new EGM™ Plus Growth Medium BulletKit™ is now available to support HUVECs without additive VEGF. HUVECs cultured in EGM™ Plus are an improved version of HUVECs cultured in EGM™ Medium. HUVECs cultured in EGM™ Plus offer faster proliferation rates while maintaining the same high quality characterization as HUVECs in EGM™ Medium.



HCAEC culture stained for von Willebrand Factor



HAEC at >90% confluency



HUVEC stained for von Willebrand Factor (red) and counterstained with DAPI (blue)

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
HAEC	Aortic endothelial	EGM™ 2 BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	5 to 9 days
HCAEC	Coronary artery	EGM™ 2MV BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	5 to 9 days
HIAEC	Iliac artery endothelial	EGM™ 2MV BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	5 to 9 days
HPAEC	Pulmonary artery	EGM™ 2 BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	5 to 9 days
HUVEC	Umbilical vein	EGM™ Plus BulletKit™	1st passage	2nd passage	2,500 cells/cm ²	5 to 7 days
HUVEC	Umbilical vein	EGM™ 2 or EGM™ BulletKit™	1st passage	2nd passage	2,500 cells/cm ²	5 to 9 days
HUVEC-XL	Umbilical vein	EGM™ 2 BulletKit™	3rd passage	n/a	2,500 cells/cm ²	5 to 9 days

Large Vessel Endothelial Cells and Media

Continued

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Normal Cells				
CC-2535	CC-2535	HAEC – Human Aortic Endothelial Cells	Cryopreserved, in EGM™ 2 BulletKit™	≥ 500,000 cells/vial
CC-2585	CC-2585	HCAEC – Human Coronary Artery Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥ 500,000 cells/vial
CC-2545	CC-2545	HIAEC – Human Iliac Artery Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥ 500,000 cells/vial
CC-2530	CC-2530	HPAEC – Human Pulmonary Artery Endothelial Cells	Cryopreserved, in EGM™ 2 BulletKit™	≥ 500,000 cells/vial
CC-2935	CC-2935	HUVEC – Umbilical Vein Endothelial Cells without VEGF, single donor	Cryopreserved in EGM™ Plus BulletKit™	≥ 500,000 cells/vial
C2517A	C2517A	HUVEC – Human Umbilical Vein Endothelial Cells	Cryopreserved, in EGM™ 2 BulletKit™, single donor	≥ 500,000 cells/vial
C2517AS	C2517AS	HUVEC – Human Umbilical Vein Endothelial Cells	Pre-screened, in EGM™ 2, single donor	≥ 500,000 cells/vial
C2519A	C2519A	HUVEC – Human Umbilical Vein Endothelial Cells	Cryopreserved, in EGM™ 2 BulletKit™, pooled	≥ 500,000 cells/vial
C2519AS	C2519AS	HUVEC – Human Umbilical Vein Endothelial Cells	Pre-screened, in EGM™ 2 BulletKit™, pooled	≥ 500,000 cells/vial
CC-2517	CC-2517	HUVEC – Human Umbilical Vein Endothelial Cells	Cryopreserved, in EGM™ BulletKit™, single donor	≥ 500,000 cells/vial
CC-2519	CC-2519	HUVEC – Human Umbilical Vein Endothelial Cells	Cryopreserved, in EGM™ BulletKit™, pooled	≥ 500,000 cells/vial
191027	191027	HUVEC-XL – Human Umbilical Vein Endothelial Cells	Cryopreserved, in EGM™ 2 BulletKit™, expanded, pooled	≥ 10 million cells/vial
Diseased Cells				
CC-2919	CC-2919	D-HAEC – Diseased Human Aortic Endothelial – Diabetes Type I	Cryopreserved, in EGM™ 2 BulletKit™	≥ 500,000 cells/vial
CC-2920	CC-2920	D-HAEC – Diseased Human Aortic Endothelial – Diabetes Type II	Cryopreserved, in EGM™ 2 BulletKit™	≥ 500,000 cells/vial
CC-2921	CC-2921	D-HCAEC – Diseased Human Coronary Artery Endothelial Cells – Diabetes Type I	Cryopreserved, in EGM™ 2MV BulletKit™	≥ 500,000 cells/vial
CC-2922	CC-2922	D-HCAEC – Diseased Human Coronary Artery Endothelial Cells – Diabetes Type II	Cryopreserved, in EGM™ 2MV BulletKit™	≥ 500,000 cells/vial
CC-2923	CC-2923	D-HPAEC – Diseased Human Pulmonary Artery Endothelial Cells – Diabetes Type I	Cryopreserved, in EGM™ 2 BulletKit™	≥ 500,000 cells/vial
CC-2924	CC-2924	D-HPAEC – Diseased Human Pulmonary Artery Endothelial Cells – Diabetes Type II	Cryopreserved, in EGM™ 2 BulletKit™	≥ 500,000 cells/vial



For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

NOTE: Normal cell media is recommended for related disease cell types.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3162	CC-3162	EGM™ 2 Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3156	CC-3156	EBM™ 2 Endothelial Cell Basal Medium-2		500 mL
CC-4176	CC-4176	EGM™ 2 Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3202	CC-3202	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4147	CC-4147	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3024	CC-3024	EGM™ Complete Endothelial Cell Growth Medium	With 2% FBS	500 mL
CC-3121	CC-3121	EBM™ Endothelial Cell Basal Medium		500 mL
CC-3129	CC-3129	EBM™ PRF Endothelial Cell Basal Medium	Phenol red-free	500 mL
CC-4133	CC-4133	EGM™ Endothelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5035	CC-5035	EGM™ Plus Endothelial cells Growth Media BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-5036	CC-5036	EBM™ Plus Endothelial Cell Basal Medium		475 ml
CC-4542	CC-4542	EGM™ Plus SingleQuot™ Kits and Growth Supplements	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

Microvascular Endothelial Cells and Media

Endothelial cells line the inside surface of blood vessels, heart, lymphatic vessels, body cavities and other organs, of normal human tissue.

We offer a variety of cell types isolated from microvascular tissue from normal, Type I and Type II diabetic donors.

■ Source

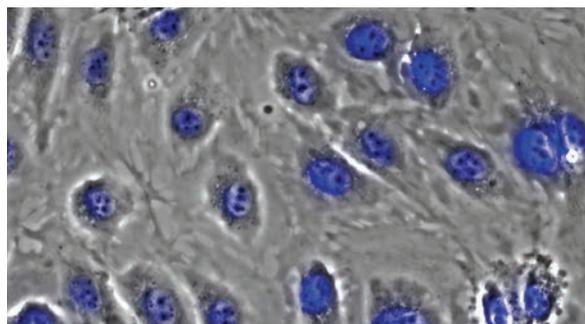
- Small vessel endothelial cells are isolated from dermal, lung, cardiac and uterine microvascular tissue

■ Applications

- Atherosclerosis
- Angiogenesis
- Arteriosclerosis
- Drug uptake or drug discovery
- Cell-to-cell junctions
- Inflammation
- Wound healing
- Oncology

■ Cell Testing and Specifications

- **Endothelial cells** – Test positive for acetylated low density lipoprotein uptake; positive for von Willebrand Factor Expression/Factor VIII; and PECAM-positive for lung microvascular cells. Up to 15 population doublings are guaranteed with normal cells when using Clonetics™ Media and Reagents



HMVEC-dAd Hoechst stain

Microvascular Endothelial Cells and Media

Continued

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
HMVEC-C	Cardiac microvascular	EGM™ 2MV BulletKit™	3rd passage	n/a	5,000 cells/cm ²	5 to 9 days
HMVEC-L	Lung microvascular	EGM™ 2MV BulletKit™	3rd or 4th passage	4th or 5th passage	5,000 cells/cm ²	5 to 9 days
HMVEC-dAd	Adult dermal microvascular	EGM™ 2MV BulletKit™	3rd passage	4th or 5th passage	5,000 cells/cm ²	5 to 9 days
HMVEC-dBNeo	Neonatal dermal blood microvascular	EGM™ 2MV BulletKit™	3rd passage	4th or 5th passage	5,000 cells/cm ²	5 to 9 days
HMVEC-dLyAd	Adult dermal lymphatic microvascular	EGM™ 2MV BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	5 to 9 days
HMVEC-dNeo	Neonatal dermal microvascular	EGM™ 2MV BulletKit™	3rd passage	4th or 5th passage	5,000 cells/cm ²	5 to 9 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Normal Cells				
CC-7016	CC-7016	HMVEC-Bd – Human Bladder Microvascular Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-7030	CC-7030	HMVEC-C – Human Cardiac Microvascular Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2543	CC-2543	HMVEC-dAd – Human Dermal Microvascular Endothelial Cells – Adult	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2813	CC-2813	HMVEC-dBI-Neo – Human Dermal Blood Microvascular Endothelial Cells – Neonatal	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2810	CC-2810	HMVEC-dLyAd – Human Dermal Lymphatic Microvascular Endothelial Cells – Adult	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2505	CC-2505	HMVEC-dNeo – Human Dermal Microvascular Endothelial Cells – Neonatal	Cryopreserved, in EGM™ 2MV BulletKit™, single donor	≥500,000 cells/vial
CC-2516	CC-2516	HMVEC-dNeo – Human Dermal Microvascular Endothelial Cells, neonatal	Cryopreserved, in EGM™ 2MV BulletKit™, pooled	≥500,000 cells/vial
CC-2527	CC-2527	HMVEC-L – Human Lung Microvascular Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
Diseased Cells				
CC-2927	CC-2927	D-HMVEC-C – Diseased Cardiac Microvascular Endothelial Cells – Diabetes Type I	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2928	CC-2928	D-HMVEC-C – Diseased Cardiac Microvascular Endothelial Cells – Diabetes Type II	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2929	CC-2929	D-HMVEC-dAD – Diseased Human Dermal Microvascular Endothelial Cells – Diabetes Type I	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2930	CC-2930	D-HMVEC-dAD – Diseased Human Dermal Microvascular Endothelial Cells – Diabetes Type II	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial



For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

More ordering information on the next page.

Microvascular Endothelial Cells and Media

Continued

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3202	CC-3202	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3156	CC-3156	EBM™ 2 Endothelial Cell Basal Medium-2		500 mL
CC-4147	CC-4147	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3125	CC-3125	EGM™ MV Microvascular Endothelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3121	CC-3121	EBM™ Endothelial Cell Basal Medium		500 mL
CC-4143	CC-4143	EGM™ MV Microvascular Endothelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

 Endothelial cells must be cultured in their isolation medium for best results.

NOTE: Normal cell media is recommended for related disease cell types.

Related Products	Page
CytoSMART™ System	268
RAFT™ 3D Culture System	272
Nucleofector™ Kits for Primary Mammalian Endothelial Cells	224

Gastrointestinal Cells and Media

The gastrointestinal tract breaks down food into nutrients and smaller molecules, which are either absorbed into the body to provide energy or expelled as a waste. Digestion occurs mainly in the stomach and small intestine. Small molecules are absorbed across the epithelium of the small intestine and later enter the bloodstream to carry nutrients to other parts of the body. Intestinal myofibroblasts reside subjacent to the basal membrane in the intestines and mediate molecular flow between the epithelium and cells in the lamina propria.

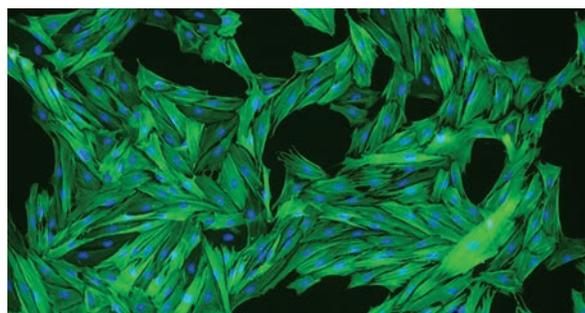
Our cryopreserved InEpC are truly primary cells representing both villi (enterocytes, goblet, and enteroendocrine cells) and crypts structures.

■ Source

- Human small intestine, specifically the jejunum

■ Applications

- Gastrointestinal disease or disorder
- Oncology
- Cell physiology
- Drug discovery
- Toxicology and cytotoxicity



Human intestinal myofibroblasts at second passage stained for α -smooth muscle actin (green) and counterstained with DAPI (blue)

■ Cell Testing and Specifications

- **Gastrointestinal myofibroblasts** – Test $\geq 90\%$ positive for α -smooth muscle actin and $\leq 10\%$ positive for the expression of desmin. Human myofibroblasts are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents
- **Intestinal epithelial cells** – test $\geq 90\%$ positive for cytokeratins 8/18. These cells cannot be subcultured. In combination with human intestinal myofibroblasts (InMyoFib), InEpC are able to form very tight cell monolayer, representing a unique *in vitro* system to model human intestinal homeostasis

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
InMyoFib	Intestinal Myofibroblasts	SmGM™ 2 BulletKit™	2nd passage	3rd passage	2,500 cells/cm ²	5 to 7 days
InEpi	Intestinal Epithelial Cells	SmGM™ 2 BulletKit™	Immediate Passage	-	150,000 viable cells/cm ²	n/a

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2902	CC-2902	InMyoFib – Human Intestinal Myofibroblasts	Cryopreserved, in SmGM™ 2 BulletKit™	$\geq 500,000$ cells/vial
CC-2931	CC-2931	InEpC – Human Intestinal Epithelial Cells	Cryopreserved, in SmGM™ 2 BulletKit™	$\geq 800,000$ viable cells/vial
CC-4540	CC-4540	Human Intestinal Epithelial and Myofibroblast Cell Combo	Includes one amp each CC-2902 and CC-2931	

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3182	CC-3182	SmGM™ 2 Smooth Muscle Cell Growth Medium -2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit

 See pages 414–423.

Related Products	Page
RAFT™ 3D Culture System	272

Lymphatic Cells and Media

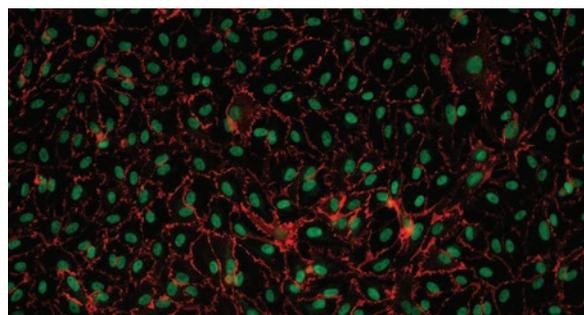
Endothelial cells are found in the membrane or monolayer lining of cells taken from lymphatic vessels of heart, lymphatic tissue, surface spinal cord, and brain, or anterior eye chamber of normal human tissue.

■ Source

- Lymphatic endothelial cells are isolated from neonatal dermal microvascular tissue

■ Applications

- Inflammation
- Wound healing
- Drug uptake or drug discovery
- Oncology
- Cell-to-cell junctions



HMVEC-dLyAd stained CD31 (red)/Prox-1 (green)

■ Cell Testing and Specifications

- **Endothelial cells** – Test positive for acetylated low density lipoprotein uptake; positive for von Willebrand Factor Expression/Factor VIII; PECAM-positive for lung microvascular cells. Up to 15 population doublings guaranteed when using Clonetics™ Media and Reagents

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
HMVEC-dLyAd	Adult dermal lymphatic microvascular	EGM™ 2MV BulletKit™	3rd passage	4th passage	5,000 cells/cm ²	4 to 7 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2810	CC-2810	HMVEC-dLyAd – Human Dermal Lymphatic Microvascular Endothelial Cells – Adult	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial

For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3156	CC-3156	EBM™ 2 Endothelial Cell Basal Medium-2		500 mL
CC-3202	CC-3202	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4147	CC-4147	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit

See pages 414–423.

Related Products	Page
CytoSMART™ System	268
Nucleofector™ Kits for Primary Mammalian Endothelial Cells	224

Mammary Epithelial Cells and Media

Mammary epithelial cells are isolated from glandular tissue in adult human breast tissue. Cells undergo changes in morphology and function throughout adulthood especially during pregnancy and lactation.

Source

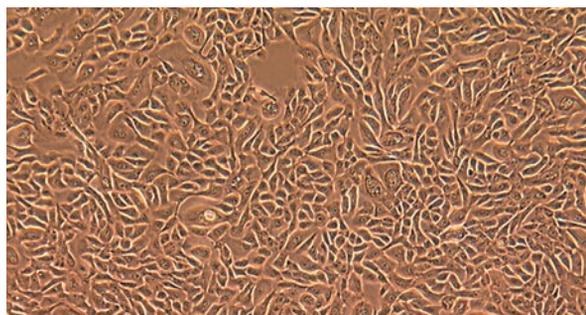
- Human adult breast tissue

Applications

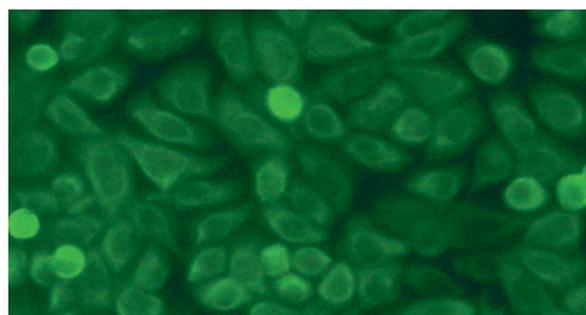
- Breast cancer
- Cellular function and differentiation
- Physiology
- Toxicology
- Hormone regulation and response

Cell Testing and Specifications

- **Human mammary epithelial cells** – Test positive for cytokeratins 14 and 18, and negative for cytokeratin 19 and are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents



HMEC 95% confluent



HMEC stained for cytokeratin 18 (green)

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
HMEC	Mammary Epithelial	MEGM™ BulletKit™	5th or 6th passage	6th or 7th passage	2,500 cell/cm ²	6 to 9 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2551	CC-2551	HMEC – Human Mammary Epithelial Cells	Cryopreserved, in MEGM™ BulletKit™	≥500,000 cells/vial
CC-2551B	CC-2551B	Mammary Epithelial Cell Culture Kit	Consists of Catalog numbers CC-2551 and CC-3150	Kit

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3150	CC-3150	MEGM™ Mammary Epithelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuotes™ Kit	Kit
CC-3151	CC-3151	MEBM™ Mammary Epithelial Cell Basal Medium		500 mL
CC-3153	CC-3153	MEBM™ Mammary Epithelial Cell Basal Medium	Phenol red-free	500 mL
CC-3051	CC-3051	MEGM™ Complete Mammary Epithelial Cell Growth Medium		500 mL
CC-4136	CC-4136	MEGM™ Mammary Epithelial Cell Growth Medium SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

Related Products	Page
RAFT™ 3D Culture System	272
CytoSMART™ System	268
Nucleofector™ Kits for Human Mammary Epithelial Cells	226

Neural Cells and Media

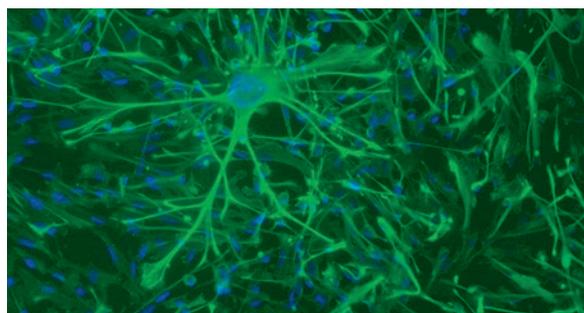
Clonetics™ Neural Cells are used to study the function of the central nervous system and how neural cells interact in normal tissue. Astrocytes are glial cells found in the brain and spinal cord that play a critical role in maintenance, support and repair of nervous tissue.

■ Source

- Human brain cortex

■ Applications

- Neurogenesis research
- Pharmacology
- Cell physiology
- Parkinson's disease
- Injury
- Astrocyte-mediated neurotoxicity
- Alzheimer's disease



NHA stained positive for GFAP (green) and counterstained DAPI (blue)

■ Cell Testing and Specifications

- **Normal human astrocytes** – Test positive for GFAP and are guaranteed through 10 population doublings when using Clonetics™ Media and Reagents

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
NHA	Astrocytes	AGM™ BulletKit™	1st passage	2nd passage	5,000 cells/cm ²	6 to 8 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2565	CC-2565	NHA – Human Astrocytes	Cryopreserved, in AGM™ BulletKit™	≥ 1 million cells/vial
PT-2599	PT-2599	NHNP – Human Neural Progenitor Cells	Cryopreserved	≥ 1.2 million cells/vial

For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3186	CC-3186	AGM™ Astrocyte Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3187	CC-3187	ABM™ Astrocyte Basal Medium		500 mL
CC-4123	CC-4123	AGM™ Astrocyte Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3209	CC-3209	NPMM™ Neural Progenitor Maintenance Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3210	CC-3210	NPBM™ Neural Progenitor Basal Medium		200 mL
CC-3229	CC-3229	NPDM™ Neural Progenitor Differentiation Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4241	CC-4241	NPMM™ Neural Progenitor Differentiation Maintenance Medium SingleQuots™ Supplements	Frozen supplements	Kit
CC-4242	CC-4242	Neural Progenitor SingleQuots™ Supplements	Frozen supplements	Kit
CC-4461	CC-4461	PNGM™ Primary Neuron Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4512	CC-4512	PNGM™ A Primary Neuron Growth Medium – Adult BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3256	CC-3256	PNBM™ Primary Neuron Basal Medium		200 mL
CC-4462	CC-4462	PNGM™ Primary Neuron Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-4511	CC-4511	PNGM™ A Primary Neuron Growth Medium – Adult SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

See pages 414–423.

Related Products	Page
Rat and Mouse Neural Cells	96
Adherent Nucleofection	186, 200

Ocular Cells and Media

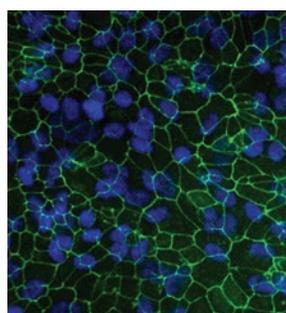
Primary RPE cells are hexagonal cells that are densely packed with pigment granules. They play a critical role in visual function and photoreceptor viability.

■ Source

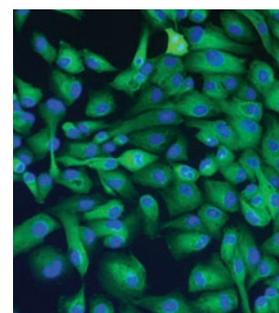
- Human eye tissue

■ Applications

- Proliferative retinopathy
- Age related macular degeneration
- Retinitis pigmentosa
- Stargardt's disease
- Blood-retinal barrier research
- Toxicology and cytotoxicity
- Diabetic retinopathy
- Blindness



RPE cells at passage 3 stained for tight junction marker ZO-1 (green) and counterstained DAPI (blue)



RPE cells at passage 3 stained for pan Cytokeratin (green), counterstained with DAPI (blue)

■ Cell Testing and Specifications

- **RPE cells** – Test $\geq 90\%$ positive for pancytokeratin marker, $\leq 10\%$ positive for fibroblast contamination, $\geq 90\%$ for tight junction marker and $\leq 1\%$ positive for endothelial marker CD31. RPE cells are guaranteed through 5 population doublings when using Clonetics™ Media and Reagents

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
h-RPE	Retinal pigment epithelial cells	RtEGM™ BulletKit™	2nd passage	3rd passage	10,000 cells/cm ²	5 to 7 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
194987	194987	H-RPE – Human Retinal Pigment Epithelial Cells	Cryopreserved, in RtEGM™ BulletKit™	$\geq 500,000$ cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
195409	195409	RtEGM™ Retinal Pigment Epithelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
195406	195406	RtEBM™ Retinal Epithelial Cell Basal Medium		500 mL
195407	195407	RtEGM™ Retinal Epithelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit

 See pages 414–423.

Related Products	Page
CytoSMART™ System	268
Rat Retinal Cells	97

Pancreatic Islets

Pancreatic islets are hormone-producing regions in pancreas. These islets consist of beta cells which produce insulin in the body. Pancreatic islets are being utilized in diabetes research as these islets restore beta-cell function yielding better regulation of insulin levels.

■ Source

- Islets are isolated from endocrine regions of the pancreas

■ Applications

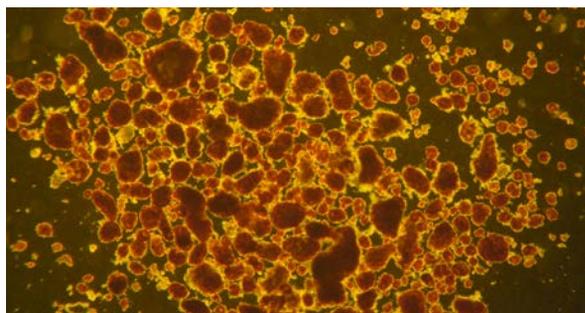
- Islet grafting survival
- Immunosuppression
- Insulin production
- Cell metabolism
- Diabetes (Type I and Type II); hypoglycemia

■ Cell Testing and Specifications

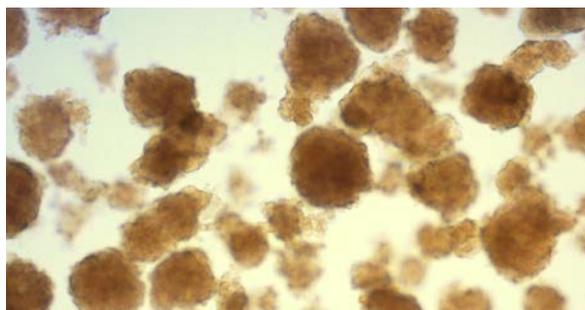
- Islets are tested for IEQ count, sterility, purity and viability prior to shipment. Each batch tests negative for HIV-1, Hepatitis B and Hepatitis C.

Pancreatic Islets are custom ordered through our Cell Bio Service group.

 Please visit www.lonza.com/islets or contact us at cellsondemand@lonza.com



Pancreatic islets stained with dithizone (DTZ)



Pancreatic islets

Prostate Cells and Media

Prostate cells provide a glandular function in the body by generating fluid which serves several functions in reproduction.

■ Source

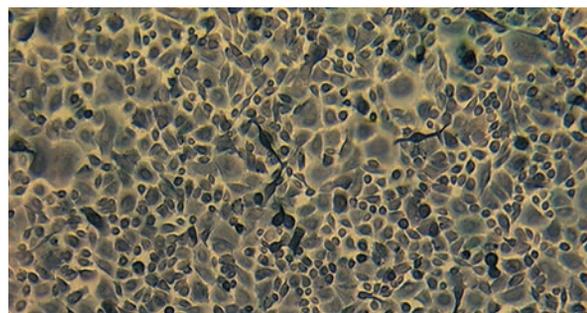
- Prostate epithelial, stromal and smooth muscle tissue depending on cell type

■ Applications

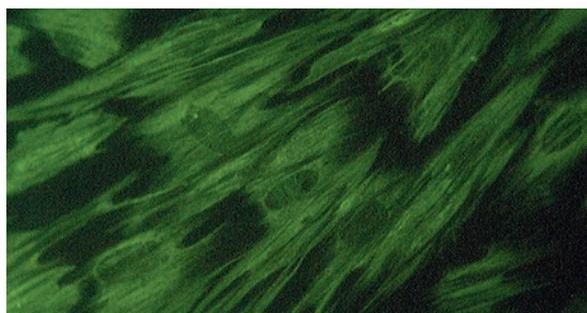
- Physiology
- Drug discovery
- Cancer research
- Procreation research

■ Cell Testing and Specifications

- **Prostate epithelial cells** – Test positive for cytokeratin (clone 8.13), prostate stromal cells test positive for vimentin and negative for pan cytokeratin. Both epithelial and stromal cell types are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents
- **Prostate smooth muscle cells** – Stain positive for α -actin and are guaranteed through 10 population doublings when using Clonetics™ Media and Reagents



PrEC – peroxidase stain for cytokeratin, clone 8.13



PrSC stained for vimentin (green)

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
PrEC	Prostate epithelial	PrEGM™ BulletKit™	1st or 2nd passage	2nd or 3rd passage	2,500 cells/cm ²	6 to 9 days
PrSC	Prostate stromal	SCGM™ BulletKit™	3rd or 4th passage	4th or 5th passage	3,500 cells/cm ²	6 to 9 days
PrSMC	Prostate smooth muscle	SmGM™ 2 BulletKit™	2nd or 3rd passage	3rd or 4th passage	3,500 cells/cm ²	6 to 9 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2508	CC-2508	PrSC – Human Prostate Stromal Cells	Cryopreserved, in SCGM™ BulletKit™	≥500,000 cells/vial
CC-2555	CC-2555	PrEC – Human Prostate Epithelial Cells	Cryopreserved, in PrEGM™ BulletKit™	≥500,000 cells/vial
CC-2587	CC-2587	PrSMC – Human Prostate Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial



For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

More ordering information on the next page.

Prostate Cells and Media

Continued

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3166	CC-3166	PrEGM™ Prostate Epithelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3165	CC-3165	PrEBM™ Prostate Epithelial Cell Basal Medium		500 mL
CC-4177	CC-4177	PrEGM™ Prostate Epithelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3205	CC-3205	SCGM™ Stromal Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3204	CC-3204	SCBM™ Stromal Cell Basal Medium		500 mL
CC-4181	CC-4181	SCGM™ Stromal Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3181	CC-3181	SmBM™ Smooth Muscle Cell Basal Medium		500 mL
CC-4149	CC-4149	SmGM™ 2 Smooth Muscle Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414 – 423.

Related Products	Page
CytoSMART™ System	268
Nucleofector™ Kits for Primary Mammalian Epithelial Cells	225
Nucleofector™ Kits for Primary Mammalian Smooth Muscle Cells	235

Pulmonary Cells and Media

Pulmonary cells are found in the lungs and can be used to study respiration including cilia movement, mucus production, gas exchange, air movement, and pulmonary vascular physiology.

We offer these airway cell types from normal, asthma, Cystic Fibrosis, COPD, and Idiopathic Pulmonary Fibrosis diagnosed donors.

■ Source

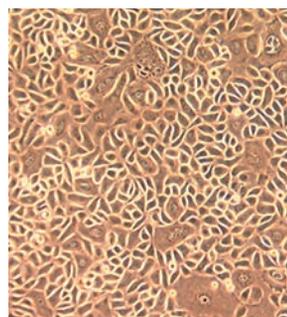
- Human small airway epithelial cells isolated from the distal portion of the lung in the 1 mm bronchiole area
- Human bronchial/tracheal epithelial cells isolated from the epithelial cells that line the airway around the bifurcation of the lungs
- Small vessel endothelial cells are isolated from lung microvascular tissue
- Human lung fibroblasts are isolated from adult lung tissue
- Human bronchial smooth muscle cells are isolated from the major bronchia
- Diseased cell types taken from donors diagnosed with either asthma, Cystic Fibrosis (CF), or COPD. Certain characteristics of diseased samples may vary; please contact Scientific Support for further donor information

■ Applications

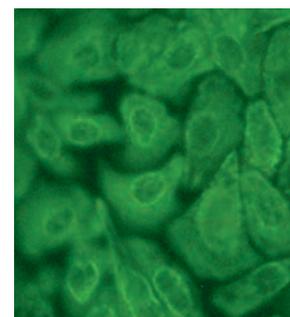
- | | |
|---------------------------------|-------------------------|
| – Cystic fibrosis | – Respiratory distress |
| – Idiopathic Pulmonary Fibrosis | – Oncology |
| – Respiratory disease | – Inhalation technology |
| – Air/Liquid interface | – Asthma |
| – COPD | – Basic research |
| | – Drug uptake studies |

■ Cell Testing and Specifications

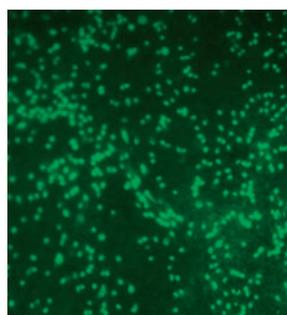
- **Human bronchial/tracheal epithelial cells and small airway epithelial cells** – Characterized by morphological observation throughout serial passage and SAEC stain positive for cytokeratin 19, both are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents
- **Human lung fibroblasts** – Test negative for von Willebrand Factor Expression/Factor VIII, cytokeratins 18 and 19, and smooth muscle α -actin and are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents
- **Smooth muscle cells** – Stain positive for α -actin and negative for von Willebrand Factor Expression/Factor VIII after differentiation and are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents



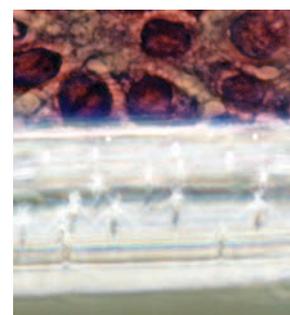
NHBE – Excellent packed cuboidal morphology



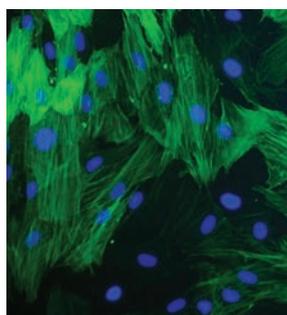
SAEC – Stained for Cytokeratin 19 (green)



NHBE – 25 days post air lift grown in B-ALI™ BulletKit™ stained for cilia with β -tubulin (green)



NHBE – Cross section on membrane, day 26 post air lift grown in B-ALI™ BulletKit™



BSMC – Stained for α -smooth muscle actin (green), counter-stained with DAPI (blue)

- **Endothelial cells** – Test positive for acetylated low density lipoprotein uptake; von Willebrand Factor Expression/Factor VIII; and PECAM-positive for lung microvascular cells. Up to 15 population doublings are guaranteed when using Clonetics™ Media and Reagents; individual cell types may vary

Ordering Information on the next page.

Pulmonary Cells and Media

Continued

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
SAEC	Small airway epithelial	SAGM™ BulletKit™	1st or 2nd passage	2nd or 3rd passage	2,500 cells/cm ²	5 to 9 days
D-SAEC-As	Diseased Small Airway Epithelial Cells – Asthma	SAGM™ BulletKit™	1st or 2nd passage	2nd or 3rd passage	2,500 cells/cm ²	5 to 9 days
D-SAEC-CF	Diseased Small Airway Epithelial Cells – Cystic Fibrosis	SAGM™ BulletKit™	1st or 2nd passage	2nd or 3rd passage	2,500 cells/cm ²	5 to 9 days
D-SAEC-COPD	Diseased Small Airway Epithelial Cells – COPD	SAGM™ BulletKit™	1st or 2nd passage	2nd or 3rd passage	2,500 cells/cm ²	5 to 9 days
NHBE with RA	Bronchial/Tracheal epithelial	BEGM™ BulletKit™	1st passage	2nd passage	3,500 cells/cm ²	6 to 9 days
NHBE without RA	Bronchial/Tracheal epithelial	BEGM™ BulletKit™	1st passage	2nd passage	3,500 cells/cm ²	6 to 9 days
DHBE-As	Diseased Bronchial/Tracheal epithelial – Asthma	BEGM™ BulletKit™	1st passage	2nd passage	3,500 cells/cm ²	6 to 9 days
DHBE-COPD	Diseased Bronchial/Tracheal epithelial – COPD	BEGM™ BulletKit™	1st passage	2nd passage	3,500 cells/cm ²	6 to 9 days
DHBE-CF	Diseased Bronchial/Tracheal epithelial - Cystic Fibrosis	BEGM™ BulletKit™	2nd passage	3rd passage	3,500 cells/cm ²	6 to 9 days
NHLF	Lung fibroblasts	FGM™ 2 BulletKit™	2nd passage	3rd passage	2,500 cells/cm ²	6 to 9 days
DHLF-As	Diseased Lung fibroblasts – Asthma	FGM™ 2 BulletKit™	2nd passage	3rd passage	2,500 cells/cm ²	6 to 9 days
DHLF-COPD	Diseased Lung fibroblasts – COPD	FGM™ 2 BulletKit™	2nd passage	3rd passage	2,500 cells/cm ²	6 to 9 days
DHLF-CF	Diseased Lung fibroblasts – Cystic Fibrosis	FGM™ 2 BulletKit™	2nd passage	3rd passage	2,500 cells/cm ²	6 to 9 days
HMVEC-L	Lung microvascular	EGM™ 2MV BulletKit™	3rd or 4th passage	4th or 5th passage	5,000 cells/cm ²	5 to 9 days
HPAEC	Pulmonary artery	EGM™ 2 BulletKit™	3rd passage	4th passage	2,500–5,000 cells/cm ²	5 to 9 days
BSMC	Bronchial SMC	SmGM™ 2 BulletKit™	2nd passage	3rd or 4th passage	3,500 cells/cm ²	6 to 10 days
DBSMC-As	Diseased Bronchial SMC – Asthma	SmGM™ 2 BulletKit™	2nd passage	3rd or 4th passage	3,500 cells/cm ²	6 to 10 days
DBSMC-COPD	Diseased Bronchial SMC – COPD	SmGM™ 2 BulletKit™	2nd passage	3rd or 4th passage	3,500 cells/cm ²	6 to 10 days
DBSMC-CF	Diseased Bronchial SMC – Cystic Fibrosis	SmGM™ 2 BulletKit™	3rd passage	4th passage	3,500 cells/cm ²	6 to 10 days
PASMC	Pulmonary Artery Smooth Muscle	SmGM™ 2 BulletKit™	3rd passage	4th or 5th passage	3,500 cells/cm ²	6 to 10 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Normal Cells				
CC-2547	CC-2547	SAEC – Human Small Airway Epithelial Cells	Cryopreserved, in SAGM™ BulletKit™	≥500,000 cells/vial
CC-2547S	CC-2547S	SAEC – Small Airway Epithelial Cells for S-ALI™ Air-Liquid-Interface Medium	Cryopreserved, in SAGM™ BulletKit™	≥500,000 cells/vial
CC-2540	CC-2540	NHBE – Human Bronchial/Tracheal Epithelial Cells	Cryopreserved, in BEGM™ BulletKit™, isolated and cultured with retinoic acid	≥500,000 cells/vial
CC-2540B	CC-2540B	Bronchial Epithelial Cell Culture Kit	Consists of Catalog numbers CC-2540 and CC-3170	≥500,000 cells/vial
CC-2540S	CC-2540S	NHBE – Normal Human Bronchial/Tracheal Epithelial Cells for B-ALI™ Bronchial Air Liquid Interface	Cryopreserved, in BEGM™ BulletKit™, isolated and cultured with retinoic acid	≥500,000 cells/vial
CC-2541	CC-2541	NHBE – Human Bronchial/Tracheal Epithelial Cells	Cryopreserved, in BEGM™ BulletKit™, isolated and cultured with retinoic acid	≥500,000 cells/vial
CC-2512	CC-2512	NHLF – Normal Human Lung Fibroblasts	Cryopreserved, in FGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2527	CC-2527	HMVEC-L – Human Lung Microvascular Endothelial Cells	Cryopreserved, in EGM™ 2MV BulletKit™	≥500,000 cells/vial
CC-2530	CC-2530	HPAEC – Human Pulmonary Artery Endothelial Cells	Cryopreserved, in EGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2581	CC-2581	HPASMC – Human Pulmonary Artery Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2576	CC-2576	BSMC – Human Bronchial Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Pulmonary Cells and Media

Continued

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Diseased Cells				
CC-2932	CC-2932	D-SAEC-As – Diseased Small Airway Epithelial Cells – Asthma	Cryopreserved, in SAGM™ BulletKit™	≥ 500,000 cells/vial
CC-2933	CC-2933	D-SAEC-CF – Diseased Small Airway Epithelial Cells – Cystic Fibrosis	Cryopreserved, in SAGM™ BulletKit™	≥ 500,000 cells/vial
CC-2934	CC-2934	D-SAEC-COPD – Diseased Small Airway Epithelial Cells – COPD	Cryopreserved, in SAGM™ BulletKit™	≥ 500,000 cells/vial
194850	194850	D-BSMC-As – Diseased Bronchial Smooth Muscle Cells – Asthma	Cryopreserved, in SmGM™ 2 BulletKit™	≥ 500,000 cells/vial
195274	195274	D-BSMC-COPD – Diseased Bronchial Smooth Muscle Cells – COPD	Cryopreserved, in SmGM™ 2 BulletKit™	≥ 500,000 cells/vial
196980	196980	D-HBSMC-CF – Diseased Human Bronchial Smooth Muscle Cells – Cystic Fibrosis	Cryopreserved, in SmGM™ 2 BulletKit™	≥ 500,000 cells/vial
196979	196979	D-HBE-CF – Diseased Human Bronchial/Tracheal Epithelial Cells – Cystic Fibrosis	Cryopreserved, in BEGM™ BulletKit™	≥ 500,000 cells/vial
194911	194911	D-HBE-As – Diseased Human Bronchial/Tracheal Epithelial Cells – Asthma	Cryopreserved, in BEGM™ BulletKit™	≥ 500,000 cells/vial
194911S	194911S	D-HBE-As – Diseased Human Bronchial/Tracheal Epithelial Cells – Asthma for B-ALI™ Bronchial Air Liquid Interface	Cryopreserved, in BEGM™ BulletKit™	≥ 500,000 cells/vial
195275	195275	D-HBE-COPD – Diseased Human Bronchial/Tracheal Epithelial Cells – COPD	Cryopreserved, in BEGM™ BulletKit™	≥ 500,000 cells/vial
195275S	195275S	D-HBE-COPD – Diseased Human Bronchial/Tracheal Epithelial Cells – COPD for B-ALI™ Bronchial Air Liquid Interface	Cryopreserved, in BEGM™ BulletKit™	≥ 500,000 cells/vial
194912	194912	D-HLF-As – Diseased Human Lung Fibroblast Cells – Asthma	Cryopreserved, in FGM™ 2 BulletKit™	≥ 500,000 cells/vial
194843	194843	D-HLF-CF – Diseased Human Lung Fibroblasts – Cystic Fibrosis	Cryopreserved, in FGM™ 2 BulletKit™	≥ 500,000 cells/vial
195277	195277	D-HLF-COPD – Diseased Human Lung Fibroblast Cell – COPD	Cryopreserved, in FGM™ 2 BulletKit™	≥ 500,000 cells/vial



For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

NOTE: Normal cell media is recommended for related disease cell types.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3118	CC-3118	SAGM™ Small Airway Epithelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3119	CC-3119	SABM™ Small Airway Epithelial Cell Basal Medium	Serum-free	500 mL
CC-4124	CC-4124	SAGM™ Human Small Airway Epithelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3170	CC-3170	BEGM™ Bronchial Epithelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit, serum-free	Kit
CC-3171	CC-3171	BEEM™ Bronchial Epithelial Cell Basal Medium		500 mL
CC-4175	CC-4175	BEGM™ Bronchial Epithelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
193514	193514	B-ALI™ Bronchial Air Liquid Interface Medium BulletKit™	Includes growth basal medium, differentiation basal media and SingleQuots™ Kit, only sold as BulletKit™ Medium	Kit
CC-4539	CC-4539	S-ALI™ Small Airway Air Liquid Interface Medium BulletKit™	Includes growth basal medium, differentiation basal media and SingleQuots™ Kit, only sold as BulletKit™ Medium	Kit
CC-3132	CC-3132	FGM™ 2 Fibroblast Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3131	CC-3131	FBM™ Fibroblast Basal Medium		500 mL
CC-4126	CC-4126	FGM™ 2 Fibroblast Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3124	CC-3124	EGM™ Endothelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3121	CC-3121	EBM™ Endothelial Cell Basal Medium		500 mL
CC-4133	CC-4133	EGM™ Endothelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3162	CC-3162	EGM™ 2 Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit

Pulmonary Cells and Media

Continued

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3156	CC-3156	EBM™ 2 Endothelial Cell Basal Medium-2		500 mL
CC-4176	CC-4176	EGM™ 2 Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3202	CC-3202	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4147	CC-4147	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3182	CC-3182	SmGM™ 2 Smooth Muscle Cell Growth Medium -2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3181	CC-3181	SmBM™ Smooth Muscle Cell Basal Medium		500 mL
CC-4149	CC-4149	SmGM™ 2 Smooth Muscle Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

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Nucleofector™ Kits for Human Bronchial Epithelial Cells	225
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Nucleofector™ Kits for Mammalian Fibroblasts	230
Nucleofector™ Kits for Primary Mammalian Smooth Muscle Cells	233
RAFT™ 3D Culture System	272

Renal Cells and Media

Renal cells are found in the kidneys. They eliminate waste products and modulate electrolytes, pH and blood plasma volume.

■ Source

- Human kidney tissue layers specific to the designated cell type; epithelial (a mixture of cortex and glomerular), cortical epithelial (a mixture of RPTEC and distal tubule), proximal tubule epithelial (proximal tubule), and mesangial cells (renal glomerulus and modified SMC between capillaries)

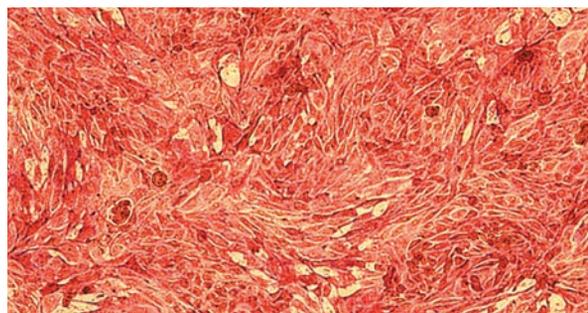
■ Applications

Our renal proximal tubule cells are available from normal or Type 2 diabetic donors.

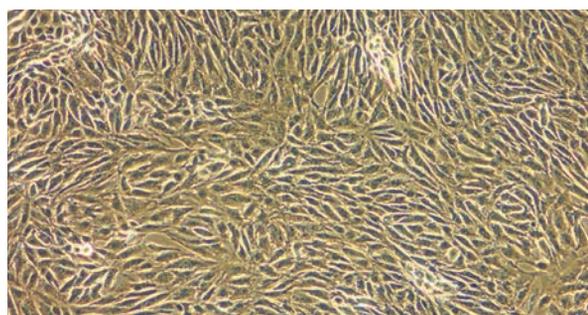
- Physiology
- Cancer research
- Cytokine production
- Cellular function differentiation
- Glomerulonephritis
- Prostaglandin activity
- Toxicology
- Phagocytosis of immune complexes

■ Cell Testing and Specifications

- RPTEC – Test positive for γ -GTP
- NHMC – Test positive for fibronectin and negative for cytokeratin 19 and von Willebrand Factor/Factor VIII
- HRE cells – Stain positive for pan cytokeratin
- HRCE – Stain positive for cytokeratin
- All cell types – Are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents



RPTEC – Stained positive for γ -GTP



RPTEC – 100% confluency

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
RPTEC	Proximal tubule	REGM™ BulletKit™	1st or 2nd passage	2nd or 3rd passage	2,500 cells/cm ²	5 to 9 days
HRCE	Cortical epithelial	REGM™ BulletKit™	1st or 2nd passage	2nd or 3rd passage	2,500 cells/cm ²	5 to 9 days
HRE	Renal epithelial	REGM™ BulletKit™	1st passage	2nd passage	2,500 cells/cm ²	5 to 9 days
NHMC	Mesangial cells	MsGM™ BulletKit™	3rd passage	4th passage	3,500 cells/cm ²	5 to 9 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2554	CC-2554	HRCE – Human Renal Cortical Epithelial Cells	Cryopreserved, in REGM™ BulletKit™	≥500,000 cells/vial
CC-2556	CC-2556	HRE – Human Renal Epithelial Cells	Cryopreserved, in REGM™ BulletKit™	≥500,000 cells/vial
CC-2559	CC-2559	NHMC – Normal Human Mesangial Cells	Cryopreserved, in MsGM™ BulletKit™	≥500,000 cells/vial
CC-2553	CC-2553	RPTEC – Human Renal Proximal Tubule Epithelial Cells	Cryopreserved, in REGM™ BulletKit™	≥500,000 cells/vial
CC-2925	CC-2925	D-RPTEC – Diseased Human Renal Proximal Tubule Epithelial Cells – Diabetes Type II	Cryopreserved, in REGM™ BulletKit™	≥500,000 cells/vial

For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Renal Cells and Media

Continued

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3190	CC-3190	REGM™ Renal Epithelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3191	CC-3191	REBM™ Renal Epithelial Cell Basal Medium		500 mL
CC-4127	CC-4127	REGM™ Renal Epithelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3146	CC-3146	MsGM™ Mesangial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-4146	CC-4146	MsGM™ Mesangial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3147	CC-3147	MsBM™ Mesangial Cell Basal Medium		500 mL
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

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Reproductive Cells and Media

The human reproductive system is made up of very diverse organs which work together for the purpose of reproduction. Both male and female reproductive cells are available for the study of reproductive science and certain gender related diseases or disorders.

■ Source

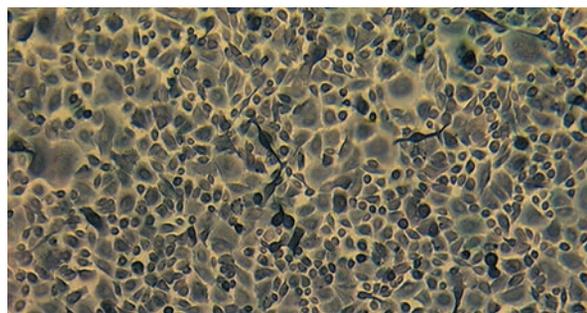
- Human male and female reproductive systems including prostate, and uterine tissue

■ Applications

- Physiology
- Cancer research
- Toxicology
- Toxic Shock Syndrome
- Drug discovery
- Procreation research
- Male infertility
- Human papillomavirus

■ Cell Testing and Specifications

- **Prostate epithelial cells** – Test positive for cytokeratin (clone 8.13), prostate stromal cells test positive for vimentin and negative for pan cytokeratin. Both epithelial and stromal cell types are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents
- **Prostate smooth muscle cells** – Stain positive for α -actin and are guaranteed to 10 population doublings when using Clonetics™ Media and Reagents
- **Uterine smooth muscle cells** – Stain positive for α -actin and negative for von Willebrand Factor after differentiation and are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents



PrEC – Peroxidase stain for cytokeratin, clone 8.13



UtSMC – Stained for smooth muscle actin (red)

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
UtSMC	Uterine smooth muscle	SmGM™ 2 BulletKit™	3rd passage	4th or 5th passage	3,500 cells/cm ²	6 to 10 days
UASMC	Umbilical artery	SmGM™ 2 BulletKit™	3rd passage	4th or 5th passage	3,500 cells/cm ²	6 to 10 days
PrEC	Prostate epithelial	PrEGM™ BulletKit™	1st or 2nd passage	2nd or 3rd passage	2,500 cells/cm ²	6 to 9 days
PrSC	Prostate stromal	SCGM™ BulletKit™	3rd or 4th passage	4th or 5th passage	3,500 cells/cm ²	6 to 9 days
PrSMC	Prostate smooth muscle	SmGM™ 2 BulletKit™	2nd or 3rd passage	3rd or 4th passage	3,500 cells/cm ²	6 to 9 days

Reproductive Cells and Media

Continued

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2562	CC-2562	UtSMC – Human Uterine Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2579	CC-2579	UASMC – Human Umbilical Artery Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2587	CC-2587	PrSMC – Human Prostate Smooth Muscle Cells	Cryopreserved, in SmGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2508	CC-2508	PrSC – Human Prostate Stromal Cells	Cryopreserved, in SCGM™ BulletKit™	≥500,000 cells/vial
CC-2555	CC-2555	PrEC – Human Prostate Epithelial Cells	Cryopreserved, in PrEGM™ BulletKit™	≥500,000 cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3202	CC-3202	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3156	CC-3156	EBM™ 2 Endothelial Cell Basal Medium-2		500 mL
CC-4147	CC-4147	EGM™ 2MV Microvascular Endothelial Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
192060	192060	KGM™ Gold Keratinocyte Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
192151	192151	KBM™ Gold Keratinocyte Basal Medium		500 mL
192152	192152	KGM™ Gold Keratinocyte Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3166	CC-3166	PrEGM™ Prostate Epithelial Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3165	CC-3165	PrEBM™ Prostate Epithelial Cell Basal Medium		500 mL
CC-4177	CC-4177	PrEGM™ Prostate Epithelial Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3205	CC-3205	SCGM™ Stromal Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3204	CC-3204	SCBM™ Stromal Cell Basal Medium		500 mL
CC-4181	CC-4181	SCGM™ Stromal Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

Related Products	Page
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Nucleofector™ Kits for Primary Mammalian Smooth Muscle Cells	235

Skeletal and Connective Tissue Cells and Media

Skeletal cells provide primary structural support as bone. Osteoblasts produce bone matrix and prime it for mineralization. Chondrocytes produce and maintain extracellular cartilage matrix. Cartilage provides joint cushioning and facilitates joint articulation. Fibroblasts are found in the stroma of tissue, where they play several important roles, such as manufacturing growth factors and protein fibers.

■ Source

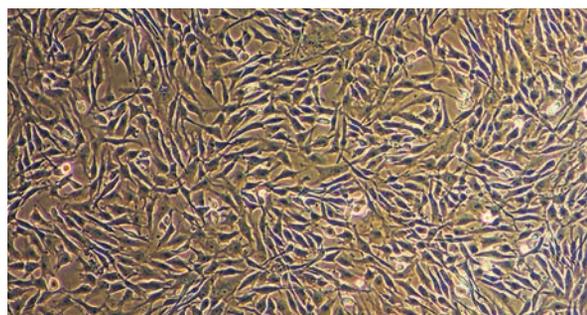
- Human osteoblasts are sourced from spongy bone tissue, and human articular chondrocytes are isolated from the knee joint. Fibroblasts are sourced from the periodontal ligament

■ Applications

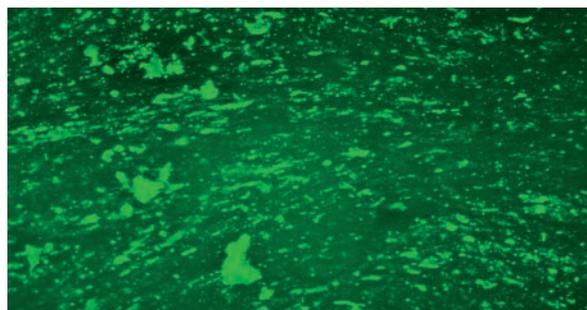
- Physiology
- Joint degeneration
- Fibrosis
- Joint replacement
- Bone repair
- Bone formation
- Bone disease
- Osteoporosis

■ Cell Testing and Specifications

- **Human articular chondrocytes** – Test positive for type II collagen and sulfated proteoglycans after differentiation and are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents
- **Human osteoblasts** – Test positive for alkaline phosphatase and bone mineralization and are guaranteed through 10 population doublings when using Clonetics™ Media and Reagents



NHAC-kn de-differentiated at 100% confluent



Day 21 Differentiated NH0st stained with OsteoImage™ Assay Kit

- **Periodontal ligament fibroblasts** – Stain negative for pan cytokeratin and are guaranteed through 10 population doublings when using Clonetics™ Media and Reagents

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
NH0st	Osteoblasts	OGM™ BulletKit™	2nd or 3rd passage	3rd or 4th passage	5,000 cells/cm ²	6 to 9 days
NHAC-kn	Articular chondrocytes, knee	CDM™ BulletKit™	2nd passage	3rd passage	10,000 cells/cm ²	4 to 9 days
HPdLF	Periodontal ligament fibroblasts	SCGM™ BulletKit™	2nd passage	3rd passage	3,500 cells/cm ²	6 to 9 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-2538	CC-2538	NH0st – Normal Human Osteoblasts	Cryopreserved, in OGM™ BulletKit™	≥500,000 cells/vial
CC-2550	CC-2550	NHAC-kn – Human Articular Chondrocytes – Knee	Cryopreserved, in CGM™ BulletKit™	≥750,000 cells/vial
CC-7049	CC-7049	HPdLF – Human Periodontal Ligament Fibroblasts	Cryopreserved, in SCGM™ BulletKit™	≥500,000 cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Skeletal and Connective Tissue Cells and Media

Continued

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3225	CC-3225	CDM™ Chondrocyte Differentiation Medium BulletKit™	Includes basal medium and SingleQuotes™ Kit	Kit
CC-3226	CC-3226	CDM™ Chondrocyte Differentiation Basal Medium		250 mL
CC-4408	CC-4408	CDM™ Chondrocyte Differentiation Medium SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3216	CC-3216	CGM™ Chondrocyte Growth Medium BulletKit™	Includes basal medium and SingleQuotes™ Kit	Kit
CC-3217	CC-3217	CBM™ Chondrocyte Basal Medium		500 mL
CC-4409	CC-4409	CGM™ Chondrocyte Growth Medium SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3207	CC-3207	OGM™ Osteoblast Growth Medium BulletKit™	Includes basal medium and SingleQuotes™ Kit	Kit
CC-3208	CC-3208	OBM™ Osteoblast Basal Medium		500 mL
CC-4194	CC-4194	OGM™ Osteoblast Growth Medium Differentiation SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-4193	CC-4193	OGM™ Osteoblast Growth Medium SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3205	CC-3205	SCGM™ Stromal Cell Growth Medium BulletKit™	Includes basal medium and SingleQuotes™ Kit	Kit
CC-3204	CC-3204	SCBM™ Stromal Cell Basal Medium		500 mL
CC-4181	CC-4181	SCGM™ Stromal Cell Growth Medium SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

Ordering Information – Reagents

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Additional reagents required to culture chondrocytes				
CC-3233	CC-3233	Chondrocyte ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL
CC-4398	CC-4398	Ascorbic Acid	25.5 mg/mL	0.5 mL
PT-4124	PT-4124	rhTGF-β3	For chondrocyte re-differentiation	2 µg

Related Products	Page
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Human Osteoclast Precursors	25
OsteoImage™ Mineralization Assay	290
Rat Osteoblasts	98

Skeletal Muscle Cells and Media

Skeletal muscle cells form the striated muscles that attach to bones in the skeletal system to control body movement. Skeletal muscle myoblasts are progenitor cells that give rise to muscle cells.

■ Source

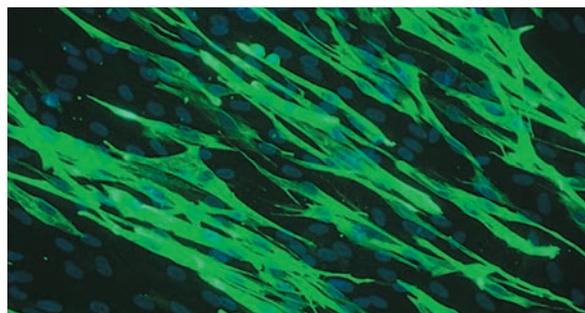
- Human skeletal muscle cells are isolated from the upper arm or upper leg, and human skeletal muscle myoblasts are isolated from post-gestational tissue, usually from quadriceps or psoas tissue. Our human skeletal muscle myoblasts are available
- from normal, Type I, or Type II diabetic donors.

■ Applications

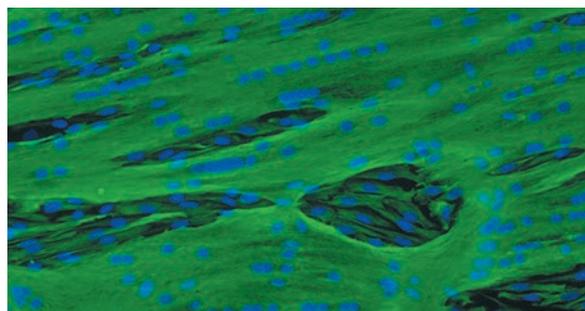
- Gene expression
- Receptor mediated function
- Differentiation
- Neuromuscular disease research
- Ion transport
- Diabetes
- Myopathy

■ Cell Testing and Specifications

- **Human skeletal muscle cells** – Test positive for desmin following differentiation and are guaranteed through 15 population doublings when using Clonetics™ Media, Reagents, and Protocols
- **Human skeletal muscle myoblasts** – Test positive for desmin as differentiated HSMM myotubes, when differentiated they form multinucleated myotubes in serum-poor media, or approaching confluence. They are guaranteed through 10 population doublings with normal cells when using Clonetics™ Media, Reagents, and Protocols



Differentiated SkMC stained positive for Desmin (green) and counter-stained with DAPI (blue)



Differentiated HSMM stained positive for Desmin (green) and counter-stained with DAPI (blue)

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
HSMM	Muscle myoblasts	SkGM™ 2 BulletKit™	2nd passage	3rd passage	3,500 cells/cm ²	5 to 9 days
SkMC	Skeletal muscle	SkGM™ BulletKit™	2nd passage	3rd passage	3,500 cells/cm ²	6 to 10 days

Skeletal Muscle Cells and Media

Continued

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Normal Cells				
CC-2561	CC-2561	SkMC – Human Skeletal Muscle Cells	Cryopreserved, in SkGM™ BulletKit™	≥500,000 cells/vial
CC-2580	CC-2580	HSMM – Human Skeletal Muscle Myoblasts	Cryopreserved, in SKGM™ 2 BulletKit™	≥500,000 cells/vial
Diseased Cells				
CC-2900	CC-2900	D-HSMM – Diseased Human Skeletal Muscle Myoblasts – Diabetes Type I	Cryopreserved, in SKGM™ 2 BulletKit™	≥500,000 cells/vial
CC-2901	CC-2901	D-HSMM – Diseased Human Skeletal Muscle Myoblasts – Diabetes Type II	Cryopreserved, in SKGM™ 2 BulletKit™	≥500,000 cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

NOTE: Normal cell media is recommended for related disease cell types.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3160	CC-3160	SKGM™ Skeletal Muscle Cell Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3161	CC-3161	SKBM™ Skeletal Muscle Cell Basal Medium		500 mL
CC-3244	CC-3244	SKGM™ 2 Skeletal Muscle Cell Growth Medium-2 SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3245	CC-3245	SKGM™ 2 Skeletal Muscle Cell Growth Medium-2 BulletKit™	Includes basal medium and SingleQuots™ Kit, without L-Glutamine	Kit
CC-3246	CC-3246	SKBM™ 2 Skeletal Muscle Cell Basal Medium-2		500 mL
CC-4139	CC-4139	SKGM™ Skeletal Muscle Cell Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
17-512F	BE17-512F	Dulbecco's Phosphate Buffered Saline [1X]	9.5 mM (PO ₄) without calcium or magnesium	500 mL
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

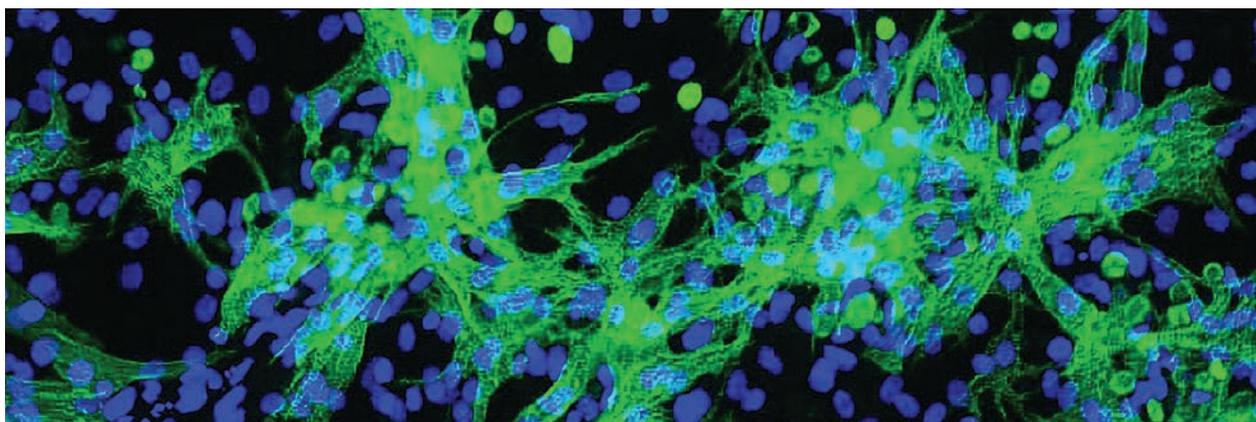
Related Products	Page
CytoSMART™ System	268

Notes

2

Primary Cells and Media

Clonetics™ Animal Primary Cells and Media



Clonetics™ Animal Primary Cells and Media

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Cell Culture Reagents	99

Introduction

Clonetics™ Animal Primary Cells are provided with the same quality standards as the Clonetics™ Human Cell Products. All cells are performance tested and test negative for mycoplasma, bacteria, yeast and fungi. Clonetics™ Cells are guaranteed to perform as indicated when used with Clonetics™ Cells, Media and Reagents. Immuno and special staining protocols, as well as characteristic morphology, are used to characterize the cells and assure they are the designated type. A Certificate of Analysis is available for each lot of each cell type, media, and reagents.

■ General Cell and Media Information

- Clonetics™ Cells are guaranteed to perform to our release criteria if cultured in our appropriate media
- Where possible, the media systems are offered as BulletKit™ Products (basal medium and separately packaged growth factors) to provide the flexibility to manipulate media components specific to your application

■ General Ordering and Shipping Information

Cryopreserved cells and media products are normally shipped Monday – Thursday for next day delivery. Saturday and Monday deliveries are available upon special request. Other cell types may be available upon request.

Cardiac Cells and Media

Cardiac cells are used to study the functions of the vascular system and general pathophysiology of the cardiovascular system.

■ Source

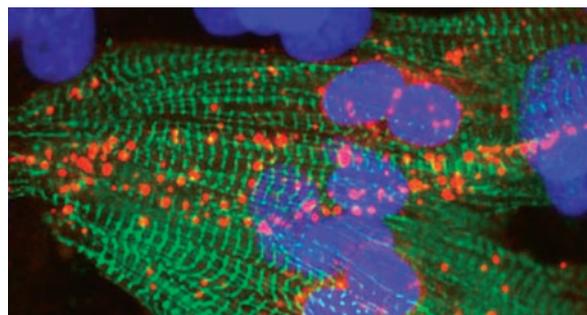
- Rat cardiac myocytes are isolated from neonatal Sprague Dawley rat hearts (ventricular tissue)
- Rat aortic smooth muscle cells are isolated from the aorta of 150–200 gram adult male Sprague-Dawley rats

■ Applications

- Arrhythmia
- Heart failure
- Angiogenesis
- Vascular research
- Cardiomyopathy
- Preventative cardiology
- Artherosclerosis

■ Cell Testing and Specifications

- **Rat cardiac myocytes** – Each vial contains approximately 4 million viable cells at $\geq 85\%$ purity. When thawed and cultured, you will obtain $\geq 80\%$ viability, with excellent morphology and connectivity, and cells will display beating at 24 hours in culture. Each lot tests positive for functional syncytium formation and stains positive for actinin. Cell function is guaranteed when using Clonetics™ Media and Reagents. Primary cardiac myocyte cells need an appropriate substrate to adhere and survive – the preferred substrate is nitrocellulose



Rat cardiac myocytes stained for alpha actinin (green), connexin 43 (red), and DAPI (blue)



Rat AoSMC cells at passage 4 stained for α -smooth muscle actin (red)

- **Rat aortic smooth muscle cells** – Stain $\geq 95\%$ positive for α -actin and negative for VE cadherin and are guaranteed through 12 population doublings when using the recommended media and reagents

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
R-CM	Rat cardiac myocytes	RCGM™ BulletKit™	Immediate	n/a	see below*	n/a
R-ASM	Rat aortic smooth muscle	DMEM:F12 + supplements	2nd passage	3rd passage	5,000 cells/cm ²	5 to 7 days

*1 mL cell suspension + 9 mL media in 24-well plate (1 mL/well) or 1 mL cell suspension + 4.3 mL media in 96-well plate (200 μ L/well)

Ordering information on the next page.

Cardiac Cells and Media

Continued

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
R-ASM-580	R-ASM-580	R-AoSM – Rat Aortic Smooth Muscle Cells	Cryopreserved	≥500,000 cells/vial
R-CM-561	R-CM-561	R-CM Rat Cardiac Myocytes	Cryopreserved	≥4 million cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-4515	CC-4515	rCGM Rat Cardiac Myocyte Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3275	CC-3275	rCBM Rat Cardiac Myocyte Basal Medium		200 mL
CC-4516	CC-4516	RCGM™ Rat Cardiac Myocyte Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-4519	CC-4519	5-Bromo-2'Deoxyuridine		Vial
BE04-687Q	BE04-687Q	Dulbecco's Modified Eagle Medium:F12 (DMEM:F12)	1:1 mixture with 3.151 g/L glucose, with L-Glutamine without HEPES	1 L
CC-4083	CC-4083	Gentamicin sulfate / Amphotericin (GA-1000)		5 mL
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

Related Products	Page
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Human Cardiac Cells	58
Nucleofector™ Kits for Rat Cardiomyocytes	218

Fibroblasts Cells and Media

Mouse embryonic fibroblasts are often used as a feeder layer to culture embryonic stem (ES) and induced pluripotent stem (iPSC) cells. They provide both a substrate for the ES cells to grow on and secrete growth factors necessary for ES cells to maintain pluripotency.

■ Source

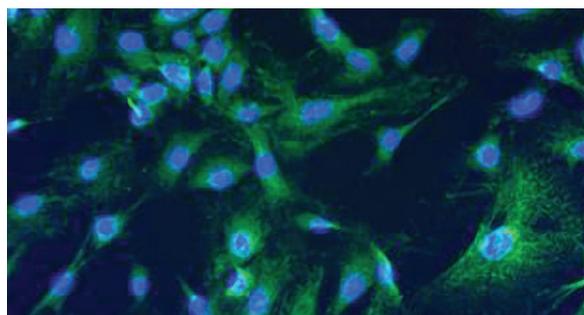
- Mouse primary embryonic fibroblasts dissociated from day 14 and 15 post-coitus CD-1 mouse embryos, expanded and then cryopreserved as frozen primaries. They have not been treated with mitomycin-C

■ Applications

- ES and iPSC research
- Feeder cell monolayer for other cell types

■ Cell Testing and Specifications

- **Mouse primary embryonic fibroblasts** – Stain positive for vimentin expression, are guaranteed for five population doublings, and display morphologic and growth properties equivalent to freshly prepared cells when approved media and supplements are used



MEF stained with Vimentin (green) at day 3 of second passage post-thaw and counterstained with DAPI (blue)

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
MEF	Mouse embryonic fibroblasts	DMEM high glucose containing 10% FBS	1st passage	2nd passage	8,000 cells/cm ²	5 to 7 days
iMEF	Irradiated mouse embryonic fibroblasts	DMEM high glucose containing 10% FBS	1st Passage	N/A	2.5x10 ⁴ cells/cm ²	N/A

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
M-FB-481	M-FB-481	MEF – Mouse Embryonic Fibroblasts	Cryopreserved	≥2 million cells/vial
M-iFB-482	M-iFB-482	Irradiated Mouse Fibroblast	Cryopreserved, inactivated via gamma irradiation	≥2 million cells/vial

 For proliferating cells and cell pellets in RNALater® contact Customer Service for order placement.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
12-604F	BE12-604F	Dulbecco's Modified Eagle Medium (DMEM)	With 4.5 g/L glucose, with L-Glutamine	500 mL

Related Products	Page
CytoSMART™ System	268
Nucleofector™ Kits for Mouse Embryonic Fibroblasts	229

Neural Cells and Media

Frozen primary neuronal cells expedite and simplify cell culture research because they can be thawed and cultured on demand to obtain high quality and high yield cultures of dissociated primary neurons.

Shipped overnight to your laboratory, these high quality, cryopreserved, dissociated primary cells represent a cost effective way to do neuronal primary cell culture, eliminating costly and time consuming animal care requirements and allowing you to control the experimental/assay timetable. Cryopreserved neuronal cells can be shipped anywhere and used any time.

■ Source

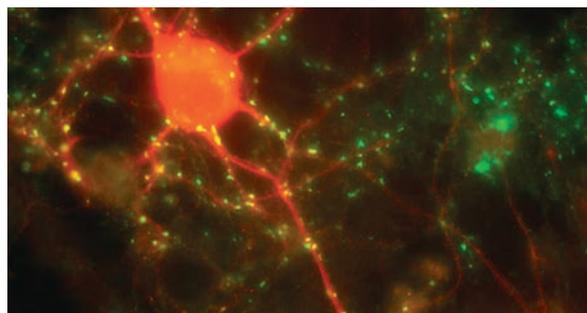
- Primary rat neurons isolated from rat brain as a native mix of high quality primary embryonic brain neuronal cells (including glia)
- Rat astrocytes are obtained from rat brain, passaged once, and cryopreserved
- Primary mouse neurons and astrocytes are isolated from two different mouse strains: C57 Black and CD1

■ Applications

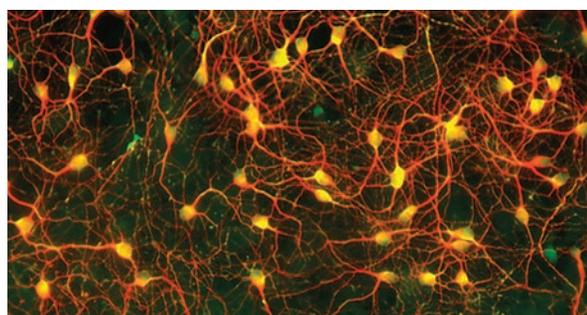
- Transfection
- Evaluation of electrophysiological properties, neurotransmitters, receptor function
- Research typical inhibitory or excitatory ion-channels
- Receptor signaling research
- Intracellular transport studies
- Neurotoxicity research

■ Cell Testing and Specifications

- **Rat neurons** – Each vial of rat neuronal cells is guaranteed to be mycoplasma and bacteria free. Additional molecular and immunochemical testing (PGP and Tuj) for quality is done following conditions that mimic shipping (specific cell types may vary). Prior to cryopreservation, each vial (1 mL) of cortical and striatal neurons contain approximately 4 million viable cells. Each vial (0.25 mL) of hippocampus neurons contain approximately 1 million viable cells
- **Rat astrocytes** – Are offered isolated from the hippocampus, cortex, or striatum of the brain or as a mixed population isolated from the hippocampus, cortex, and striatum of the brain. These astrocytes are passaged once and cryopreserved. Each vial (1.0 mL) of rat astrocytes contains approximately 1 million viable cells. Following confluence, the astrocytes can be harvested once for re-plating. Each vial of astrocytes is guaranteed mycoplasma and bacteria



Cortical and striatal rat neurons cells were thawed, co-cultured 21 days, and immunofluorescently stained with anti- vesicular GABA transporter (vGAT) [green] and anti-dopamine receptor protein (DARP) [red]



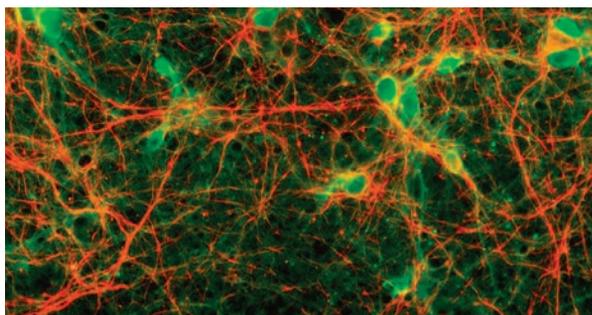
Rat cortical neuronal cells were thawed, cultured 14 days, and immunofluorescently stained with anti-PGP 9.5 and anti β -tubulin

free. Astrocytes are batch-tested for growth characteristics and morphology (GFAP)

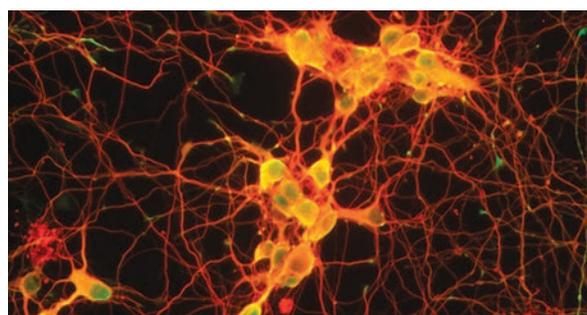
- **Mouse neurons** – Are available isolated from the hippocampus, cortex, or striatum of the brain. These neurons are cryopreserved immediately after isolation without culturing. Each vial (1.0 mL) of mouse cortex or striatum neurons contain approximately 4 million viable cells. Each vial (0.25 mL) of mouse hippocampal neurons contain approximately 1 million viable cells. Each vial of neurons is guaranteed mycoplasma and bacteria free. Additional molecular and immunochemical testing for specific neuronal markers is also performed depending on cell type
- **Mouse astrocytes** – Are a mixed population isolated from the hippocampus, cortex, and striatum of the brain. These astrocytes are passaged once and cryopreserved. Each vial (0.5 mL) of mouse astrocytes contains approximately 1 million viable cells. Following confluence, the astrocytes can be harvested once for re-plating. Each vial of astrocytes is guaranteed mycoplasma and bacteria free. Astrocytes are batch-tested for growth characteristics and morphology (GFAP)

Neural Cells and Media

Continued



Immunofluorescence image of cryopreserved rat cortical cells thawed and cultured 21 days stained with anti-PGP 9.5 and anti-neurofilament



Cryopreserved mouse cortical neuronal cells were thawed and cultured 12 days, then immunofluorescently stained with anti-PGP 9.5 and anti- β -tubulin

Cell Type	Description	Recommended Media	Cryopreserved Cells	Culture Time
R-Cx	Rat brain cortex neurons	PNGM™ BulletKit™	Immediate	14–21 days
R-Hi	Rat brain hippocampus neurons	PNGM™ BulletKit™	Immediate	14–21 days
R-Cp	Rat brain striatum neurons	PNGM™ BulletKit™	Immediate	14–21 days
R-Drg	Rat dorsal root ganglion neurons	PNGM™ BulletKit™	Immediate	14–21 days
R-eDrg	Embryonic rat dorsal root ganglion neurons	PNGM™ BulletKit™	Immediate	14–21 days
R-Cb	Rat cerebellar neurons	PNGM™-A BulletKit™	Immediate	14–21 days
R-HTh	Rat brain hypothalamic neurons	PNGM™ BulletKit™	Immediate	14–21 days
R-CxAs	Rat brain cortex astrocytes	AGM™ BulletKit™	Primary passage	14–21 days
R-HiAs	Rat brain hippocampus astrocytes	AGM™ BulletKit™	Primary passage	14–21 days
R-CpAs	Rat brain striatum astrocytes	AGM™ BulletKit™	Primary passage	14–21 days
R-AsM	Rat brain Cx-Hi-Cp mix astrocytes	AGM™ BulletKit™	Primary passage	14–21 days
R-G	Rat microglia	DMEM high glucose containing 10% FBS	Immediate	7+ days
M-Cx	Mouse brain cortex neurons	PNGM™ BulletKit™	Immediate	14–21 days
M-Cp	Mouse brain striatum neurons	PNGM™ BulletKit™	Immediate	14–21 days
M-Hi	Mouse brain hippocampus neurons	PNGM™ BulletKit™	Immediate	14–21 days
M-AsM	Mouse brain mixed astrocytes	AGM™ BulletKit™	Primary passage	21+ days

Ordering information on the next page.

Neural Cells and Media

Continued

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
M-AsM-430	M-AsM-430	M-AsM – Mouse CD1 Brain Mixed Astrocytes	Cryopreserved, 0.5 mL	≥1 million cells/vial
M-AsM-330	M-AsM-330	M-AsM – Mouse CD57 Brain Mixed Astrocytes	Cryopreserved, 0.5 mL	≥1 million cells/vial
M-Cp-302	M-Cp-302	M-Cp – Mouse C57 Brain Striatum Neurons	Cryopreserved, 1.0 mL	≥4 million cells/vial
M-Cp-402	M-Cp-402	M-Cp – Mouse CD1 Brain Striatum Neurons	Cryopreserved, 1.0 mL	≥4 million cells/vial
M-Cx-300	M-Cx-300	M-Cx – Mouse C57 Brain Cortex Neurons	Cryopreserved, 1.0 mL	≥4 million cells/vial
M-Cx-400	M-Cx-400	M-Cx – Mouse CD1 Brain Cortex Neurons	Cryopreserved, 1.0 mL	≥4 million cells/vial
M-Hi-401	M-Hi-401	M-Hi – Mouse Brain Hippocampus Neurons	Cryopreserved, 0.25 mL	≥1 million cells/vial
R-AsM-530	R-AsM-530	R-AsM – Rat Brain Cx-Hi-Cp Mix Astrocytes	Cryopreserved, 1.0 mL	≥1 million cells/vial
R-Cb-503	R-Cb-503	R-Cb – Rat Cerebellar Neurons	Cryopreserved, 1.0 mL	≥4 million cells/vial
R-Cp-502	R-Cp-502	R-Cp – Rat Brain Striatum Neurons	Cryopreserved, 1.0 mL	≥4 million cells/vial
R-CpAs-522	R-CpAs-522	R-CpAs – Rat Brain Striatum Astrocytes	Cryopreserved, 1.0 mL	≥1 million cells/vial
R-Cx-500	R-Cx-500	R-Cx – Rat Brain Cortex Neurons	Cryopreserved, 1.0 mL	≥4 million cells/vial
R-CxAs-520	R-CxAs-520	R-CxAs – Rat Brain Cortex Astrocytes	Cryopreserved, 1.0 mL	≥1 million cells/vial
R-Drg-505	R-Drg-505	R-DRG – Rat Dorsal Root Ganglion Neurons	Cryopreserved, 0.25 mL	≥200,000 cells/vial
R-eDRG-515	R-eDRG-515	R-eDRG – Rat Dorsal Root Ganglion Neurons – Embryonic	Cryopreserved, 0.25 mL	≥1 million cells/vial
R-G-535	R-G-535	R-G – Rat Microglia	Cryopreserved, 0.25 mL	≥2 million cells/vial
R-Hi-501	R-Hi-501	R-Hi – Rat Brain Hippocampus Neurons	Cryopreserved, 0.25 mL	≥1 million cells/vial
R-HiAs-521	R-HiAs-521	R-HiAs – Rat Brain Hippocampus Astrocytes	Cryopreserved, 1.0 mL	≥1 million cells/vial
R-Hth-507	R-Hth-507	R-Hth – Rat Brain Hypothalamus Neurons	Cryopreserved, 0.5 mL	≥2 million cells/vial

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-4461	CC-4461	PNGM™ Primary Neuron Growth Medium BulletKit™	Includes basal medium and SingleQuotes™ Kit	Kit
CC-3256	CC-3256	PNBM™ Primary Neuron Basal Medium		200 mL
CC-4462	CC-4462	PNGM™ Primary Neuron Growth Medium SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-4512	CC-4512	PNGM™ A Primary Neuron Growth Medium – Adult BulletKit™	Includes basal medium and SingleQuotes™ Kit	Kit
CC-4511	CC-4511	PNGM™-A Primary Neuron Growth Medium – Adult SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-3186	CC-3186	AGM™ Astrocyte Growth Medium BulletKit™	Includes basal medium and SingleQuotes™ Kit	Kit
CC-3187	CC-3187	ABM™ Astrocyte Basal Medium		500 mL
CC-4123	CC-4123	AGM™ Astrocyte Growth Medium SingleQuotes™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

Related Products	Page
Human Neural Cells	71
Rat Retinal Cells	97
Adherent Nucleofection	186, 200
Nucleofector™ Kits for Mammalian Glial Cells	240
Nucleofector™ Kits for Mouse Neurons	237
Nucleofector™ Kits for Rat Neurons	238

Ocular Cells and Media

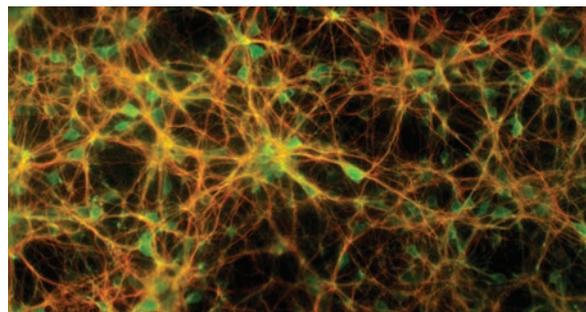
The vertebrate retina is a light sensitive tissue lining the inner surface of the eye. Light strikes the retina, creates an image and initiates a cascade of chemical and electrical events that ultimately trigger nerve impulses. These impulses are sent to visual centers of the brain through the fibers of the optic nerve.

■ Source

- Rat retinal cells isolated from neonatal (day 3–4) Sprague-Dawley rats and comprised of the seven cell types normally found in retina. They are prepared by dissection/dissociation without purification, cryopreserved, and are ready for immediate culture

■ Applications

- General ophthalmic research
- Posterior segment disease
- Neoplasms
- Cell therapies
- Toxicology and cytotoxicity
- Inflammation
- Drug delivery
- Degeneration
- Gene expression



Rat retinal cells stained for neuron specific class III β -tubulin (Tuj-1) and neuronal protein gene product (PGP 9.5)

■ Cell Testing and Specifications

- **Rat retinal cells** – Each lot tests negative for mycoplasma and sterility. Immunostaining for neuron specific class III β -tubulin (Tuj-1), specific neuronal protein gene product (PGP 9.5), ganglion cell marker, Thy1.1, and GFAP

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Culture Time
R-Ret	Rat retinal cells	PNGM™ BulletKit™	Immediate	n/a	14–21 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
R-ReT-508	R-ReT-508	R-Ret-Neo – Rat Retinal Cells, neonatal	Cryopreserved, 0.5 mL	≥200,000 cells/vial

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-4461	CC-4461	PNGM™ Primary Neuron Growth Medium BulletKit™	Includes basal medium and SingleQuots™ Kit	Kit
CC-3256	CC-3256	PNBM™ Primary Neuron Basal Medium		200 mL
CC-4462	CC-4462	PNGM™ Primary Neuron Growth Medium SingleQuots™ Supplements and Growth Factors	Frozen supplements	Kit
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each

 See pages 414–423.

Related Products	Page
Human Neural Cells	71

Skeletal Cells and Media

Skeletal cells provide primary structural support as bone. Osteoblasts produce bone matrix and prime it for mineralization. Bone cells are responsible for the body's response to trauma and fracture to strengthen, develop, heal, and grow bone.

■ Source

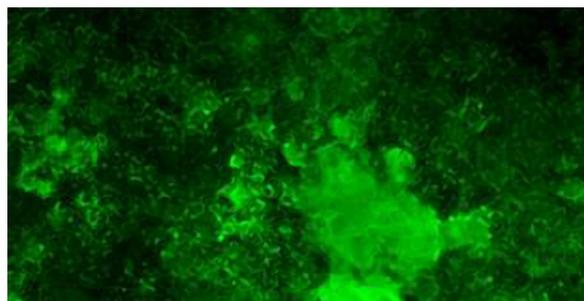
- Rat calvariae osteoblasts dissociated from Sprague-Dawley rat embryos (E20, E21)

■ Applications

- Physiology
- Bone formation
- Joint replacement
- Bone repair
- Bone disease
- Osteoporosis

■ Cell Testing and Specifications

- **Rat osteoblasts** – Are cryopreserved at dissection and each vial of osteoblasts contains ≥ 0.35 million viable cells. This will seed into approximately three 6-well plates for mineralization studies, three T-25 flasks or one T-75 flask for proliferation studies using the recommended plating densities and medium



Rat osteoblasts stained with OsteoImage™ Assay for mineralization at day 24

- **Rat osteoblasts** – Will undergo at least 12 population doublings and are tested for mineralization after differentiation. For mineralization studies, it is recommended to plate cells directly out of cryopreservation into multi-well plates. Upon inducing differentiation, cells require 3 to 5 weeks to sufficiently form mineralized nodules

Cell Type	Description	Recommended Media	Cryopreserved Cells	Proliferating Cells	Recommended Seeding Density	Time to Subculture
R-OST	Rat calvariae osteoblasts	DMEM high glucose	1st Passage	n/a	5,000–7,000 cells/cm ²	5 to 7 days

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
R-OST-583	R-OST-583	R-OST – Rat Calvariae Osteoblasts	Cryopreserved, in DMEM	$\geq 500,000$ cells/vial

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
12-604F	BE12-604F	Dulbecco's Modified Eagle Medium (DMEM)	With 4.5 g/L glucose, with L-Glutamine	500 mL

Related Products	Page
CytoSMART™ System	268
Human MSCs	29
Human Skeletal and Connective Tissue	84
OsteoImage™ Mineralization Assay	290

Cell Culture Reagents

Ordering Information – Reagents

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-5002	CC-5002	Trypsin Neutralizing Solution		100 mL
CC-5012	CC-5012	Trypsin/EDTA Solution		100 mL
CC-5022	CC-5022	HEPES Buffered Saline Solution		100 mL
CC-5024	CC-5024	HEPES Buffered Saline Solution		500 mL
CC-5034	CC-5034	ReagentPack™ Subculture Reagents	Trypsin/EDTA, trypsin neutralizing solution, and HEPES buffered saline solution	100 mL each
T100A		Retronectin® Recombinant Human Fibronectin Fragment	Recombinant human bronectin fragment CH-296 produced in <i>E.coli</i> . When coated on the surface of asks and plates, Retronectin® significantly enhances retrovirus-mediated gene transfer into mammalian cells.	0.5 mg
T100B		Retronectin® Recombinant Human Fibronectin Fragment	Recombinant human fibronectin fragment CH-296 produced in <i>E.coli</i> . When coated on the surface of asks and plates, Retronectin® significantly enhances retrovirus-mediated gene transfer into mammalian cells.	2.5 mg
T110A	T110A	Retronectin® Dish		10 dishes (35mm)

 Additional Cell Culture Reagents can be found on pages 414–423.

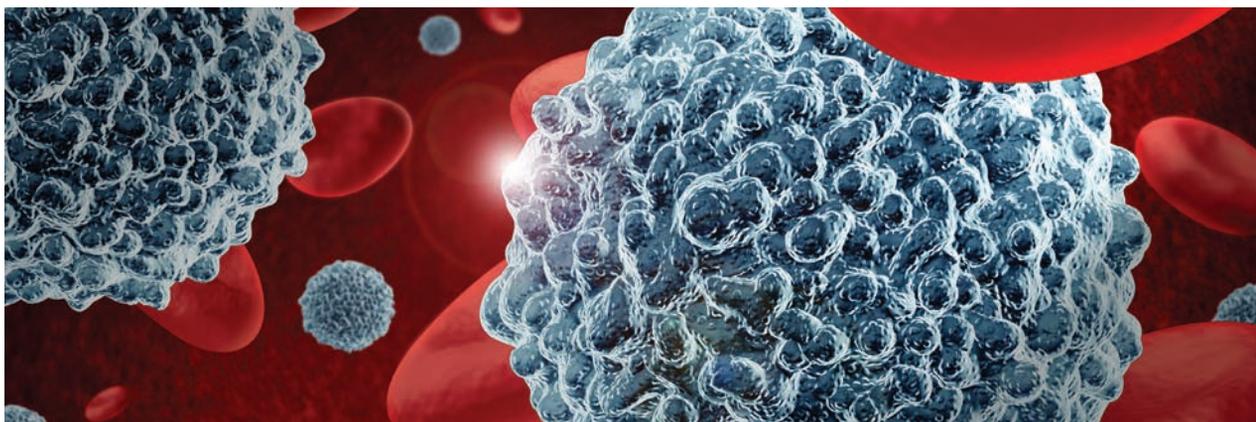
Ordering Information – Growth Factors

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-4009	CC-4009	Bovine Pituitary Extract	13 mg/mL	2 mL
CC-4068	CC-4068	hFGF – Human Fibroblastic Growth Factor	1 µg/mL	1 mL
CC-4098	CC-4098	Bovine Brain Extract	9 mg/mL	5 mL
CC-4092	CC-4092	Bovine Brain Extract	3 mg/mL	2 mL
CC-4107	CC-4107	hEGF Human Epidermal Growth Factor	3 µg/mL	0.5 mL
CC-4202	CC-4202	Calcium Chloride	300 mM	2 mL
CC-4205	CC-4205	Human Transferrin	10 mg/mL	0.5 mL
CC-4323	CC-4323	NSF-1 Neural Survival Factor-1	50X Concentration	4 mL
CC-4398	CC-4398	Ascorbic Acid	25.5 mg/mL	0.5 mL

 Additional Cell Culture Reagents can be found on pages 414–423.

Poietics™ Immune Cells and Media

Leading the attack on immune cell research



Poietics™ Immune Cells and Media

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Introduction

Essential Tools for Hematopoietic Research

Working with hematopoietic and immune cells requires not only a variety of donors, but also patience and skill to isolate and characterize specific cell types.

Let our 30+ years of experience help eliminate your hassles of finding donors, performing tedious cell isolations, and characterizing cells, so you can focus on your research.

Cells You Can Count On to Perform

Cell performance is critical. We are so confident of the quality of our cells that we guarantee* viable cell counts and purity claims. Now you can get more for your money and stop worrying about the integrity of your cells.

Optimized Culture Systems

Your cells need sustenance to perform well. Depending upon your cell of choice, use Lonza's HPGM™ or LGM™ 3 Media for optimal performance.

Choices in Cell Type and Tissue Source

Cells from different tissue sources can behave differently, which is why we offer cell types from a variety of tissue sources. In the following pages you can explore our catalog of fresh, unprocessed bone marrow as well as cells isolated from bone marrow, cord blood, and peripheral blood. We also have a custom cell isolation service, Cell Bio Service, to support non-catalog cell types or special bone marrow requests for your larger volume projects.

*Guarantee/guaranteed means Lonza will replace or refund the applicable portion of the purchase on terms more fully described at www.lonza.com/hematopoiesis

Fresh Human Bone Marrow

We find the donor, you find the cure

We are Committed to Handling the Logistics So You Can Focus on Finding the Cure.

Providing the research community with unprocessed, normal human bone marrow while maintaining the well-being of our donors is at the forefront of our proprietary IRB approved bone marrow donor program. We have been delivering the fresh bone marrow you need for over 20 years so you can focus on the important work behind finding the cure.

More Cells

Fresh bone marrow samples are never diluted and contain greater than 15 million nucleated cells per mL, giving you more cells for your money. A total of 100 mL per donor can be ordered in 10 or 25 mL quantities.

Relevant Results

A variety of donors is one of the cornerstones of relevant research results. We established our bone marrow donor program over 20 years ago in order to provide you with a variety of normal donors to help ensure you have relevant sample representation. In addition, we also understand the challenges HLA typing can present. In order to help you overcome some of those challenges, we now offer whole blood and bone marrow from the same donor.

Fresh Delivery

Fresh bone marrow is shipped at ambient temperature for next day delivery, so your samples arrive fresh and viable. International orders are also available, with varying lead times.



Donor Criteria

- Healthy males and non-pregnant females between the ages of 18 and 45 years old
- Acceptable vital signs and hematology values
- All donors are screened for general health and negative medical history for heart disease, kidney disease, liver disease, cancer, epilepsy, blood diseases, and bleeding disorders
- Negative blood tests for HIV-1, HIV-2, Hepatitis B and Hepatitis C

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Bone Marrow				
1M-105	1M-105	Unprocessed Human Bone Marrow	Fresh	10 mL
1M-125	1M-125	Unprocessed Human Bone Marrow	Fresh	25 mL
1W-500	1W-500	Autologous Peripheral Blood*	Fresh	100 mL

*Cryopreserved, in EGM™ 2 BulletKit™*Whole peripheral blood can currently only be purchased in combination with an order for unprocessed bone marrow from the same donor.

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3211	CC-3211	LGM™ 3 Lymphocyte Growth Medium-3		500 mL

Bone Marrow and Cord Blood Hematopoietic Cells

Bone marrow and cord blood contain hematopoietic stem cells which are at the origin of hematopoiesis, the process by which blood cells are made. Hematopoietic cells are of increasing interest for their ability to help elucidate a more thorough understanding of the intricacies of the immune system and human disease.

Cord blood cells have been found to be phenotypically and functionally immature, suggesting they may not be as capable of mediating graft-versus-host disease as bone marrow or peripheral blood derived cells. This makes them an interesting tool for transplantation research. However, the number of umbilical cord cells is limited and thus poses a challenge in research as well as clinical utility. Conversely, bone marrow cells are unique in that they provide researchers the ability to work with large numbers of cells from a single donor or investigate differences in donors of various ages, genders, or ethnicities. Most cell types are available from a variety of bone marrow and cord blood donors so you can compare and contrast characteristics and functions of cells from various donors as well as tissue sources.

CD34⁺ Cells

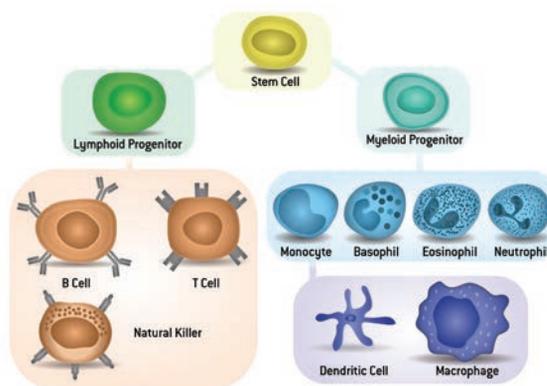
CD34⁺ cells are known to differentiate into all the various blood cell types. In addition, there is a positive correlation between the concentration of CD34⁺ cells and the likelihood of hematopoietic reconstitution upon transplantation. Thus, whether you are focusing on cell therapy research or drug discovery, CD34⁺ cells can play an important role in your hematopoietic research program.

- Isolated via immunomagnetic separation
- Characterization: ≥90% CD34⁺ as assessed by flow cytometry
- Available from bone marrow and cord blood

Mononuclear Cells

Mononuclear cells (MNCs) are a mixed population of single nucleus cells, such as monocytes and lymphocytes. MNCs can be further purified or pushed to differentiate into individual cell types.

- Isolated via density gradient separation
- Available from bone marrow and cord blood



Stromal Cells

Bone marrow stromal cells are a mixed population of cell types, including fibroblasts, MSCs, adipocytes, endothelial cells, and macrophages. These cells can be used as a feeder layer for growing hematopoietic stem and progenitor cells for weeks without the need for exogenous cytokines.

- Mixed population mononuclear cells are cultured for 3–4 weeks, harvested, and cryopreserved
- Available from bone marrow

HPGM™ Hematopoietic Progenitor Growth Medium

HPGM™ can be used in combination with various cytokines to support proliferation or differentiation of hematopoietic stem and progenitor cells.

- Serum-free and chemically defined medium that contains only human proteins
- Tested for ability to support both proliferation and differentiation
- For use with bone marrow and cord blood CD34⁺, mononuclear

Ordering information on the next page.

Bone Marrow and Cord Blood Hematopoietic Cells

Continued

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Bone Marrow				
2M-101	2M-101	Human Bone Marrow CD34 ⁺ Progenitor Cells	Cryopreserved	≥100,000 cells/vial
2M-101A	2M-101A	Human Bone Marrow CD34 ⁺ Progenitor Cells	Cryopreserved	≥300,000 cells/vial
2M-101B	2M-101B	Human Bone Marrow CD34 ⁺ Progenitor Cells	Cryopreserved	≥500,000 cells/vial
2M-101C	2M-101C	Human Bone Marrow CD34 ⁺ Progenitor Cells	Cryopreserved, volume discount available	≥1 million cells/vial
2M-101D	2M-101D	Human Bone Marrow CD34 ⁺ Progenitor Cells	Cryopreserved	≥2 million cells/vial
2S-101D	2S-101D	Human Bone Marrow Mononuclear Cells	Cryopreserved	≥5 million cells/vial
2M-125C	2M-125C	Human Bone Marrow Mononuclear Cells	Cryopreserved	≥25 million cells/vial
2M-125E	2M-125E	Human Bone Marrow Mononuclear Cells	Cryopreserved	≥300 million cells/vial
2M-302	2M-302	Human Bone Marrow Stromal Cells	Cryopreserved, non-irradiated	≥5 million cells/vial
Cord Blood				
2C-101B	2C-101B	Human Cord Blood CD34 ⁺ Progenitor Cells	Cryopreserved	≥100,000 cells/vial
2C-101A	2C-101A	Human Cord Blood CD34 ⁺ Progenitor Cells	Cryopreserved	≥500,000 cells/vial
2C-101	2C-101	Human Cord Blood CD34 ⁺ Progenitor Cells	Cryopreserved	≥1 million cells/vial
2C-150	2C-150	Human Cord Blood Mononuclear Cells	Cryopreserved	≥200 million cells

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
PT-3926	PT-3926	HPGM™ Hematopoietic Progenitor Growth Medium		500 mL
CC-3211	CC-3211	LGM™ 3 Lymphocyte Growth Medium-3		500 mL

Related Products	Page
Nucleofector™ Kits for Primary Blood Cells	206, 216
Nucleofector™ Kits for Human Monocytes	212

Peripheral Blood Immune Cells

The human immune system is a complex and intricate network of cells and signaling pathways aimed at defending the body against the many pathogens present in our environment. To make things even more complex, studies are also providing insight into the intricacies of the intersections between the immune system and diseases such as cancer, brain disorders, and cardiovascular disease. Studying immunology and human disease *in vitro* requires not only finding donors, but also patience and skill to isolate specific immune cell types.

Cryopreserved cells can eliminate the hassles of finding donors and doing tedious cell isolations because all you have to do is thaw and culture. Let Lonza simplify your life with purified immune cells and optimized culture media.

Peripheral Blood Mononuclear Cells (PBMCs)

PBMCs are a mixed population of single nucleus cells. They can be further purified into individual cell types such as NK cells, T cells, and B cells. In addition, PBMCs are often times a rich source of monocytes, which can be directed to differentiate into either macrophages or dendritic cells through culture with various cytokines.

- Isolated via density gradient separation
- Guaranteed* to contain ≥ 50 million viable cells per ampoule

CD14⁺ Monocytes

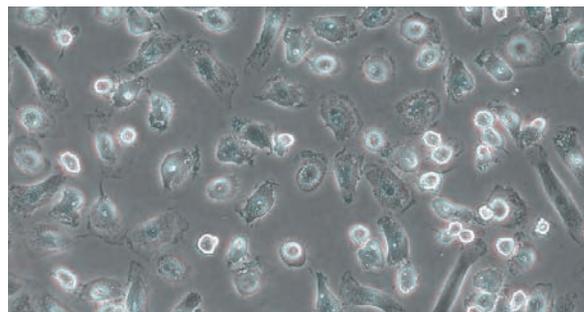
Monocytes play an important role in host defense as circulating monocytes and can also differentiate into tissue macrophages as well as antigen-presenting dendritic cells.

- Isolated via immunomagnetic separation from PBMCs
- Characterization: $\geq 90\%$ CD14⁺ as assessed by flow cytometry
- Available in three sizes and guaranteed* to contain ≥ 10 , 20, or 40 million viable cells per ampoule, depending upon vial size ordered

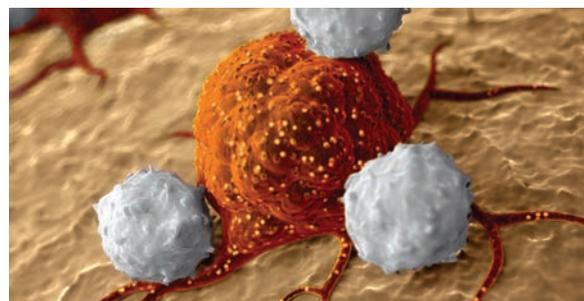
CD4⁺ T Cells

CD4⁺T cells play an important role in the cell-mediated immune response to infection. They work with other immune cells to promote various aspects of the immune system, such as macrophage activation and enhanced activity of natural killer cells.

- Isolated via positive immunomagnetic separation from mononuclear enriched cell population
- Characterization: $\geq 90\%$ CD4⁺ as assessed by flow cytometry
- Guaranteed* to contain ≥ 10 million viable cells per ampoule



Human CD14⁺ monocytes differentiating to macrophages



Human natural killer cell

Natural Killer (NK) Cells

NK cells are key players in both innate and adaptive immunity and thus, are a critical component in overall host defense and immune regulation. They are traditionally characterized by their presence of the CD56 marker and absence of CD3. In addition, expression of CD16 is related to potency of NK cell cytotoxic effector activity.

- Isolated via either positive or negative immunomagnetic separation
- Characterization: $\geq 90\%$ CD56⁺ as assessed by flow cytometry. CD16 expression is typically 60–90%. Negatively selected cells tend to exhibit higher amounts of CD16⁺ cells.
- ≥ 5 million viable cells per ampoule

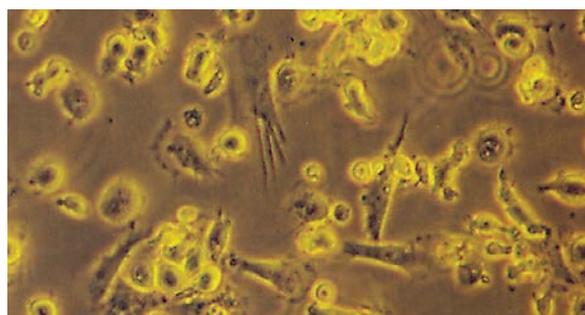
*Guarantee/guaranteed means Lonza will replace or refund the applicable portion of the purchase on terms more fully described at www.lonza.com/hematopoiesis

Peripheral Blood Immune Cells

Dendritic Cells (DCs)

DCs are the messenger cells of the immune system, where they process and present pathogenic antigens to host T cells in order to initiate an immune response. There are many categories of DCs, with the monocyte-derived cells (Mo-DC or MDCC) being the most common.

- Immature DCs are differentiated from monocytes via culture with IL-4 and GM-CSF
- Characterization: CD11c, CD86, CD80, HLA-DR, and CD14
- ≥ 3 million viable cells per ampoule
- Depending upon culture conditions, these cells are able to either survive up to 7 days in culture as immature DCs or fully differentiate into mature DCs upon culture with additional cytokines



Normal human dendritic cells

LGM™ 3 Lymphocyte Growth Medium

LGM™ 3 was optimized for serum-free growth and maintenance of lymphocytes and dendritic cells. Cytokine and growth conditions vary depending upon application. The Lonza Scientific Support team is happy to suggest culture conditions for different applications.

- Serum-free and chemically defined medium that contains only human proteins
- Comes complete with human albumin, insulin, and transferrin
- Addition of cytokines may be required, depending upon application

Ordering Information – Cells

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
Peripheral Blood				
CC-2702	CC-2702	HPBMC – Human Peripheral Blood Mononuclear Cells	Cryopreserved, volume discount available	≥ 50 million cells/vial
2W-400C	2W-400C	Human Peripheral Blood CD14 ⁺ Monocytes	Cryopreserved	≥ 10 million cells/vial
2W-400B	2W-400B	Human Peripheral Blood CD14 ⁺ Monocytes	Cryopreserved	≥ 20 million cells/vial
2W-400A	2W-400A	Human Peripheral Blood CD14 ⁺ Monocytes	Cryopreserved	≥ 40 million cells/vial
2W-200	2W-200	Human Peripheral Blood CD4 ⁺ T Cells	Cryopreserved	≥ 10 million cells/vial
CC-2701	CC-2701	NHDC – Human Dendritic Cells	Cryopreserved	≥ 2.5 million cells/vial
2W-502	2W-502	NK – Human Natural Killer Cells	Cryopreserved, positive selection	≥ 5 million cells/vial
2W-501	2W-501	NK – Human Natural Killer Cells	Cryopreserved, negative selection	≥ 5 million cells/vial

Ordering Information – Media

Cat. No. NA	Cat. No. EU	Product Name	Product Description	Size
CC-3211	CC-3211	LGM™ 3 Lymphocyte Growth Medium-3		500 mL

Related Products	Page
Nucleofector™ Kits for Human Monocytes	212
Nucleofector™ Kits for Human T Cells	214