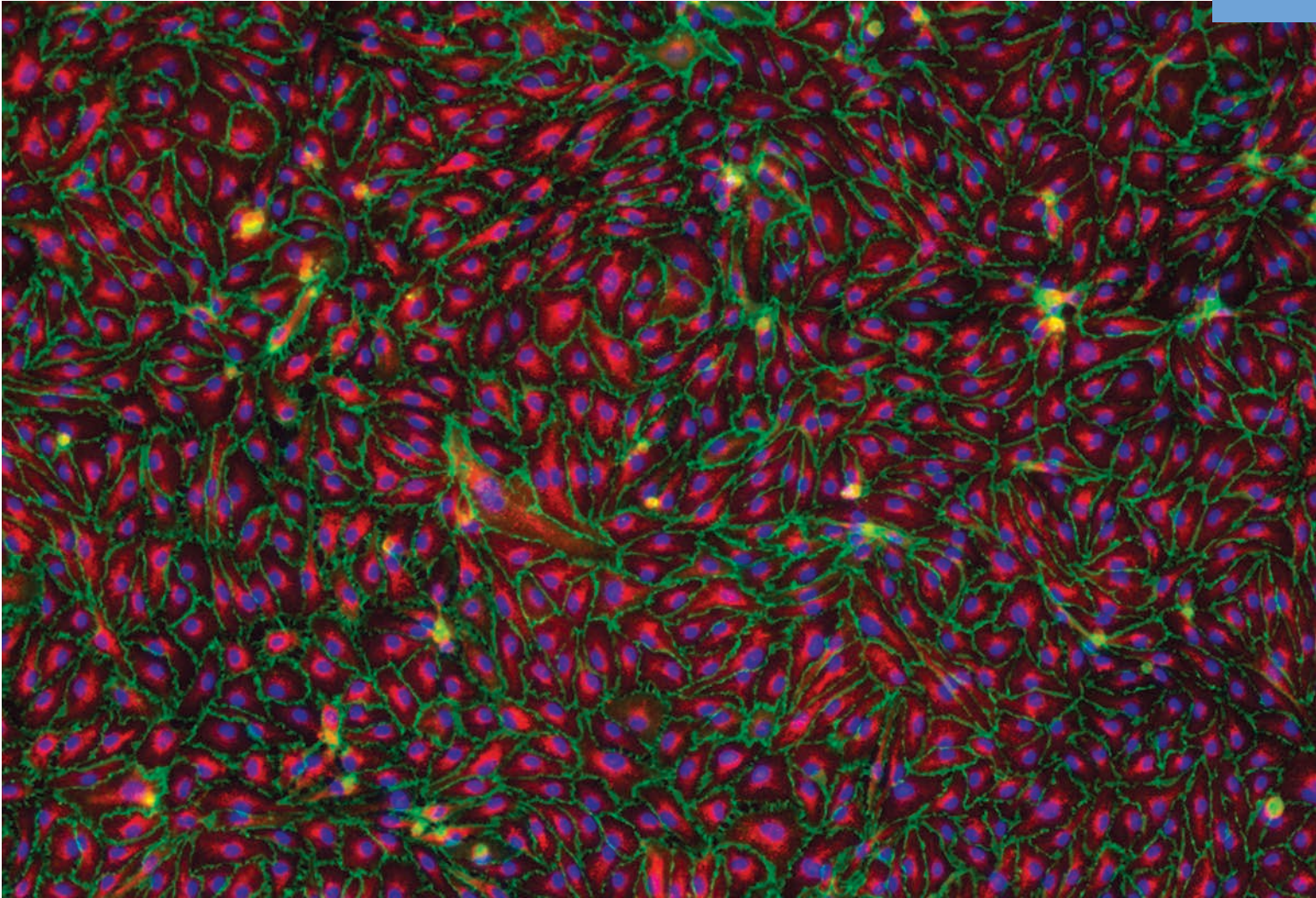




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These products are for research use only.

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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| 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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| 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

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| 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

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| 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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| 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

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| 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

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

Mesangial Cells

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| Kidney | CC-2559 | MsGM™ | CC-3146 | 80 |
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Myoblasts

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| 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 |

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| 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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| 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

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| Prostate | CC-2508 | SCGM™ | CC-3205 | 74,83 |
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Hematopoietic Cells

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| 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.

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Hematopoietic Cell Media

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| PT-3926 | HPGM™ Hematopoietic Progenitor Growth Medium | 500 mL | 104 |
| CC-3211 | LGM™ 3 Lymphocyte Growth Medium-3 | 500 mL | 106 |
| 04-380Q | X-VIVO™ 10 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, gentamicin, and phenol red | 1 L | 141 |
| 04-743Q | X-VIVO™ 10 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, without gentamicin or phenol red | 1 L | 141 |
| 04-744Q | 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 |
| 04-418Q | X-VIVO™ 15 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, gentamicin, and phenol red | 1 L | 141 |
| 04-448Q | X-VIVO™ 20 Serum-free Hematopoietic Cell Medium – Chemically Defined With L-Glutamine, gentamicin and phenol red | 1 L | 141 |

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| 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™ | C2519ASW6 | C2519ASW12 | C2519ASW24 | C2519ASW48 | C2517ASW96 | C2519AST25 | C2519AST75 | C2519AST150 | C2519AST225 |
| 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 Kerationocytoes – 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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| 12-well | 24-well | 48-well | 96-well | T-25 | T-75 | T-150 | T-225 |
|------------|------------|------------|------------|------------|------------|-------------|-------------|
| | | | | | | | |
| CC-7014W12 | CC-7014W24 | CC-7014W48 | CC-7014W96 | CC7014T25 | CC7014T75 | CC7014T150 | CC7014T225 |
| CC-2571W12 | CC-2571W24 | CC-2571W48 | CC-0148 | CC-2671 | CC-0234 | CC2571T150 | CC2571T225 |
| CC-2533W12 | CC-2533W24 | CC-2533W48 | CC-2533W96 | CC-2533T25 | CC-2533T75 | CC2533T150 | CC2533T225 |
| CC-2576W12 | CC-2576W24 | CC-2576W48 | CC-0180 | CC-2676 | CC-0240 | CC2576T150 | CC2576T225 |
| CC-2583W12 | CC-2583W24 | CC-2583W48 | CC-0096 | CC-2683 | CC-0258 | CC2583T150 | CC2583T225 |
| CC-2535W12 | CC-2535W24 | CC-2535W48 | CC-0132 | CC-2635 | CC-0222 | CC2535T150 | CC2535T225 |
| CC-2585W12 | CC-2585W24 | CC-2585W48 | CC-0188 | CC-2685 | CC-0261 | CC2585T150 | CC2585T225 |
| CC-2545W12 | CC-2545W24 | CC-2545W48 | CC-0095 | CC-2645 | CC-0291 | CC2545T150 | CC2545T225 |
| CC-2551W12 | CC-2551W24 | CC-2551W48 | CC-0140 | CC-2651 | CC-0228 | CC2551T150 | CC2551T225 |
| CC-7016W12 | CC-7016W24 | CC-7016W48 | CC-7016W96 | CC-7016T25 | CC-7016T75 | CC7016T150 | CC7016T225 |
| CC-7030W12 | CC-7030W24 | CC-7030W48 | CC-7030W96 | CC-7030T25 | CC-7030T75 | CC-7030T150 | CC-7030T225 |
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| CC-2516W12 | CC-2516W24 | CC-2516W48 | CC-2516W96 | CC-2616 | CC-0288 | CC2516T150 | CC2516T225 |
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| CC-2530W12 | CC-2530W24 | CC-2530W48 | CC-0128 | CC-2630 | CC-0219 | CC2530T150 | CC2530T225 |
| CC-7049W12 | CC-7049W24 | CC-7049W48 | CC-7049W96 | CC-7049T25 | CC-7049T75 | CC-7049T150 | CC-7049T225 |
| CC-2554W12 | CC-2554W24 | CC-2554W48 | CC-0172 | CC-2654 | CC-0270 | CC2554T150 | CC2554T225 |
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| CC-2580W12 | CC-2580W24 | CC-2580W48 | CC-2580W96 | CC-2580T25 | CC-2580T75 | CC2580T150 | CC2580T225 |
| CC-2519W12 | CC-2519W24 | CC-2519W48 | CC-2519W96 | CC-2619 | CC-0276 | CC2519T150 | CC2519T225 |
| C2519AW12 | C2519AW24 | C2519AW48 | C2519AW96 | C2519AT25 | C2519AT75 | C2519AT150 | C2519AT225 |
| C2519ASW12 | C2519ASW24 | C2519ASW48 | C2517ASW96 | C2519AST25 | C2519AST75 | C2519AST150 | C2519AST225 |
| CC-2517W12 | CC-2517W24 | CC-2517W48 | CC-0124 | CC-2617 | CC-0216 | CC2517T150 | CC2517T225 |
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| CC-2550W12 | CC-2550W24 | CC-2550W48 | CC-2550W96 | CC-2550T25 | CC-2550T75 | CC2550T150 | CC2550T225 |
| CC-2565W12 | CC-2565W24 | CC-2565W48 | CC-0093 | CC-2665 | CC-0297 | CC2565T150 | CC2565T225 |
| CC-2540W12 | CC-2540W24 | CC-2540W48 | CC-0136 | CC-2640 | CC-0225 | CC2540T150 | CC2540T225 |
| CC-2541W12 | CC-2541W24 | CC-2541W48 | CC-0100 | CC-2641 | CC-0285 | CC2541T150 | CC2541T225 |
| CC-2511W12 | CC-2511W24 | CC-2511W48 | CC-0160 | CC-2611 | CC-0252 | CC2511T150 | CC2511T225 |
| CC-2509W12 | CC-2509W24 | CC-2509W48 | CC-0116 | CC-2609 | CC-0210 | CC2509T150 | CC2509T225 |
| CC-2501W12 | CC-2501W24 | CC-2501W48 | CC-0104 | CC-2601 | CC-0201 | CC2501T150 | CC2501T225 |
| 192627W12 | 192627W24 | 192627W48 | 192627W96 | 192627T25 | 192627T75 | 192627T150 | 192627T225 |
| CC-2503W12 | CC-2503W24 | CC-2503W48 | CC-0108 | CC-2603 | CC-0204 | CC2503T150 | CC2503T225 |
| 192907W12 | 192907W24 | 192907W48 | 192907W96 | 192907T25 | 192907T75 | 192907T150 | 192907T225 |
| CC-2507W12 | CC-2507W24 | CC-2507W48 | CC-0156 | CC-2607 | CC-0255 | CC2507T150 | CC2507T225 |
| 192906W12 | 192906W24 | 192906W48 | 192906W96 | 192906T25 | 192906T75 | 192906T150 | 192906T225 |
| CC-2504W12 | CC-2504W24 | CC-2504W48 | CC-2504W96 | CC-2504T25 | CC-2504T75 | CC-2504T150 | CC-2504T225 |
| CC-2512W12 | CC-2512W24 | CC-2512W48 | CC2512T150 | CC-2612 | CC-0282 | CC2512T225 | CC-0164 |
| CC-2559W12 | CC-2559W24 | CC-2559W48 | CC-0176 | CC-2659 | CC-0273 | CC2559T150 | CC2559T225 |
| CC-2538W12 | CC-2538W24 | CC-2538W48 | CC-2538W96 | CC-2538T25 | CC-2538T75 | CC2538T150 | CC2538T225 |
| CC-2581W12 | CC-2581W24 | CC-2581W48 | CC-0152 | CC-2681 | CC-0237 | CC2581T150 | CC2581T225 |
| CC-2555W12 | CC-2555W24 | CC-2555W48 | CC-0088 | CC-2655 | CC-0310 | CC2555T150 | CC2555T225 |
| CC-2508W12 | CC-2508W24 | CC-2508W48 | CC-2508W96 | CC-2608 | CC-2508T75 | CC2508T150 | CC2508T225 |
| CC-2587W12 | CC-2587W24 | CC-2587W48 | CC-2587W96 | CC-2587T25 | CC-2587T75 | CC2587T150 | CC2587T225 |
| CC-2553W12 | CC-2553W24 | CC-2553W48 | CC-0168 | CC-2653 | CC-0267 | CC2553T150 | CC2553T225 |

| 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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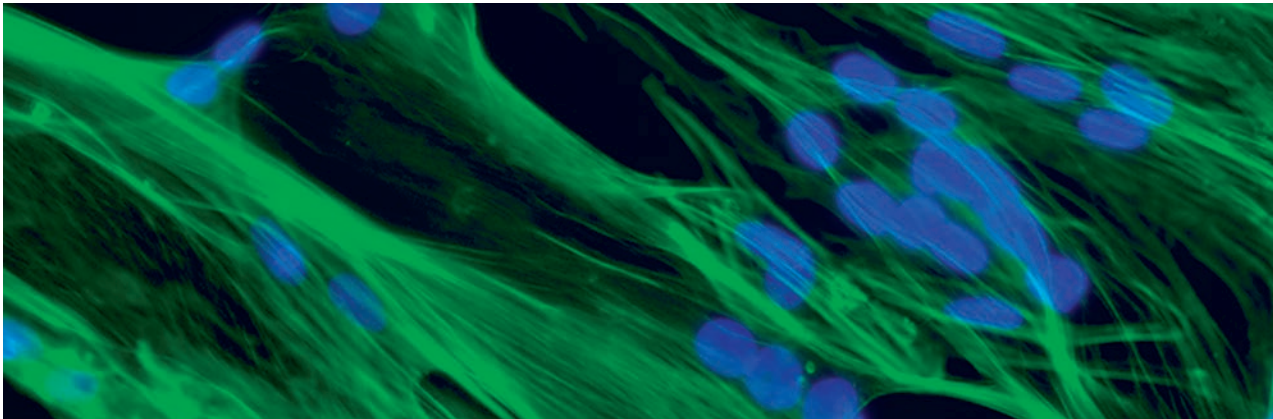
| Part Number | Proliferating Cell Type Description | Recommended Media | 6-well | 12-well | 24-well | 48-well | 96-well | T-25 | T-75 | T-150 | T-225 |
|--------------------------------|--|----------------------|-----------|------------|------------|------------|------------|------------|------------|-------------|-------------|
| 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 |

Notes

2

Clonetics™ Human Primary Cells and Media

In vivo relevance. *In vitro* results.



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

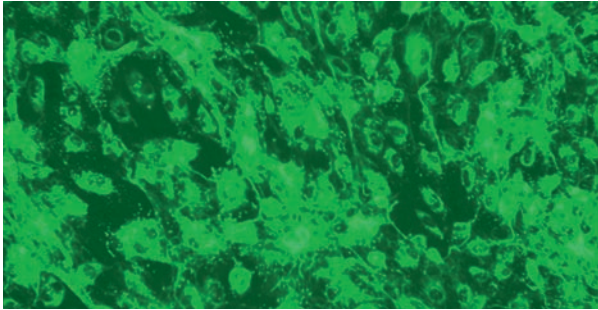
- Human bladder smooth muscle cells and human bladder microvascular endothelial cells both isolated from specific tissues layers surrounding the bladder

■ Applications

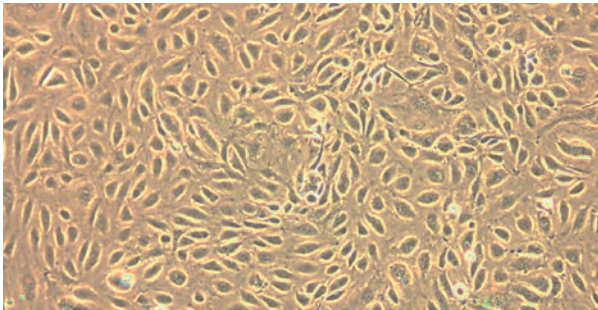
- Overactive bladder
- Cancer
- Urologic disease

■ 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

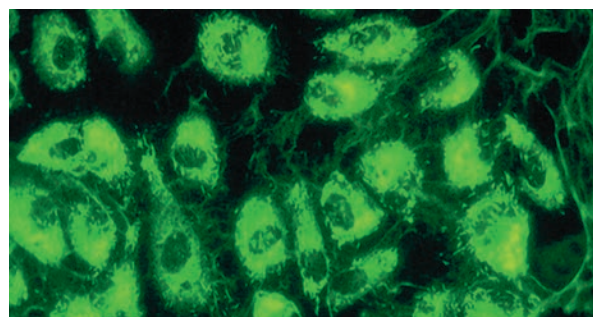
- Human aorta adventitial fibroblasts isolated from tunica external of ascending or descending aorta
- Cardiac fibroblasts isolated from atrial and ventricular cardiac tissue
- Endothelial cells isolated from human aorta, and coronary artery, and small vessel endothelial cells from ventricle tissue
-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

Applications

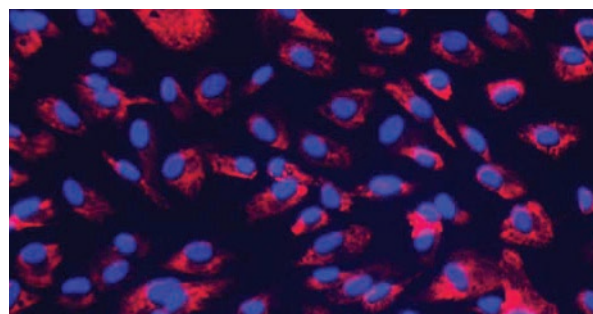
- Arrhythmia
- Cardiomyopathy
- Heart failure
- Preventative cardiology
- Vascular research

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

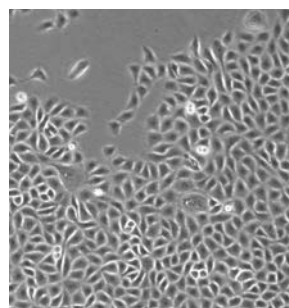
- Small vessel endothelial cells derived from dermal microvascular tissue
- Adult human dermal fibroblasts derived from adult skin tissue and neonatal human dermal fibroblasts derived from neonatal foreskins
- Keratinocytes derived from human neonatal foreskins and adult skin tissue
- Melanocytes derived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

■ Applications

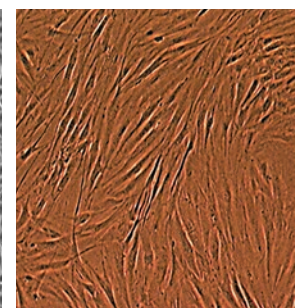
- | | |
|---------------------------------|--|
| – Epithelial cell model | – Cancer |
| – Wound healing | – Drug efficacy |
| – Burn therapy | – Immunology |
| – Dermatology disorders | – Fibrosis |
| – Inflammation | – Angiogenesis |
| – Drug uptake or drug discovery | – Oncology |
| – Cell-to-cell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

■ Cell Testing and Specifications

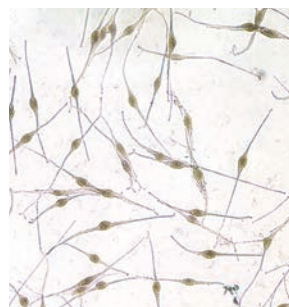
- **Endothelial cells** – Test positive for acetylated low density lipoprotein uptake and positive for von Willebrand Factor Expression/Factor VIII. Up to 15 population doublings are guaranteed for normal cells when using Clonetics™ Media and Reagents
- **Fibroblasts** – NHDF are characterized by morphological 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



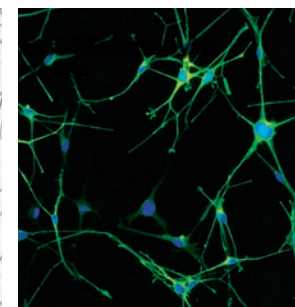
KGM™ Gold Adult NHEK cells in passage 2



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.


2

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

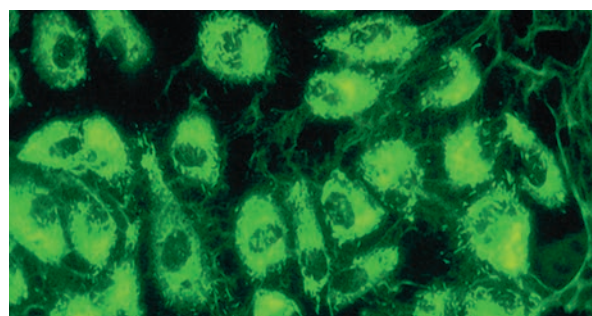
- Atherosclerosis
- Arteriosclerosis
- Drug uptake or drug discovery
- Wound healing
- Angiogenesis
- Inflammation
- Oncology

■ Cell Testing and Specifications

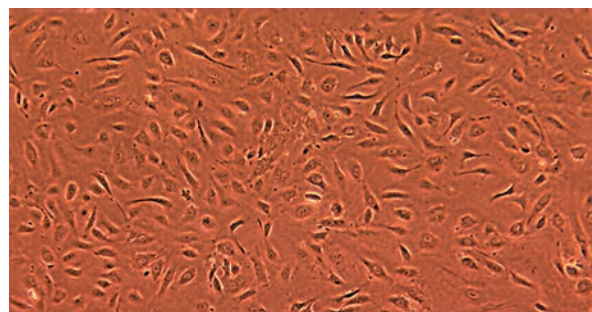
- **Endothelial cells** – Test positive for acetylated low density lipoprotein uptake; positive for von Willebrand Factor Expression/Factor VIII. HUVEC test $\geq 90\%$ double positive for CD31/CD105 markers by flow cytometry. Up to 15 population doublings are guaranteed with normal cells when using 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™

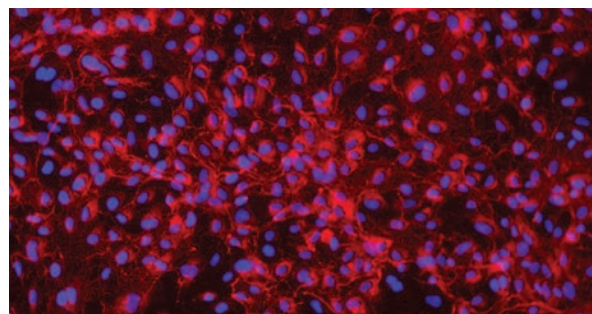
Our new EGM™ Plus Growth Medium BulletKit™ is now available to support HUVECs without additive VEGF. HUVECs cultured in EGM™ Plus are an improved version of HUVECs cultured in EGM™ Medium. HUVECs cultured in EGM™ Plus offer faster proliferation rates while maintaining the same high quality characterization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

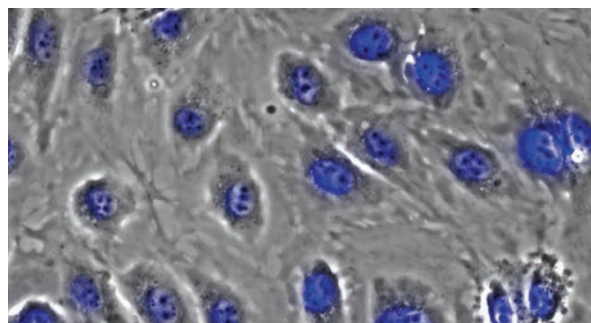
- Small vessel endothelial cells are isolated from dermal, lung, cardiac and uterine microvascular tissue

■ Applications

- | | |
|---------------------------------|--------------------------|
| – Atherosclerosis | – Cell-to-cell junctions |
| – Angiogenesis | – Inflammation |
| – Arteriosclerosis | – Wound healing |
| – Drug uptake or drug discovery | – 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 subadjacent to the basal membrane in the intestines and mediate molecular flow between the epithelium and cells in the lamina propria.

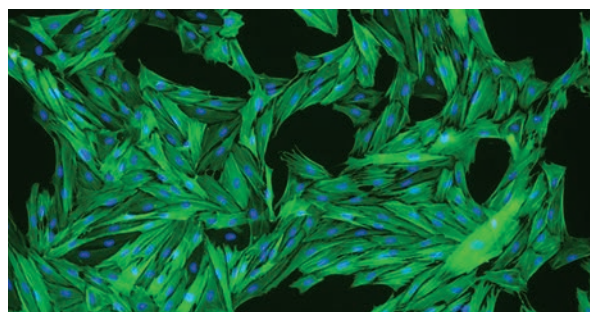
Our cryopreserved InEpC are truly primary cells representing both villi (enterocytes, goblet, and enteroendocrine cells) and crypts structures.

■ Source

- Human small intestine, specifically the jejunum

■ Applications

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



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

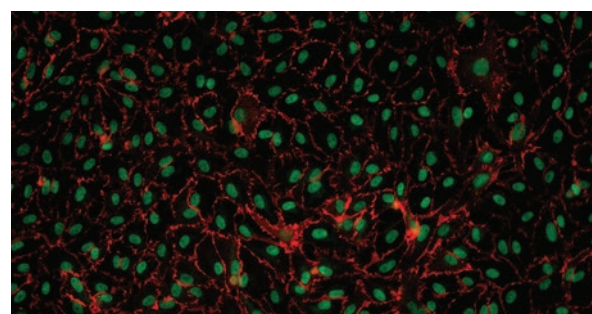
Endothelial cells are found in the membrane or monolayer lining of cells taken from lymphatic vessels of heart, lymphatic tissue, surface spinal cord, and brain, or anterior eye chamber of normal human tissue.

■ 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 supplementsFrozen 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

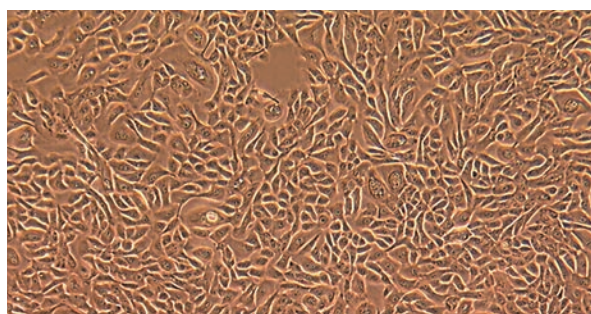
- Human adult breast tissue

■ Applications

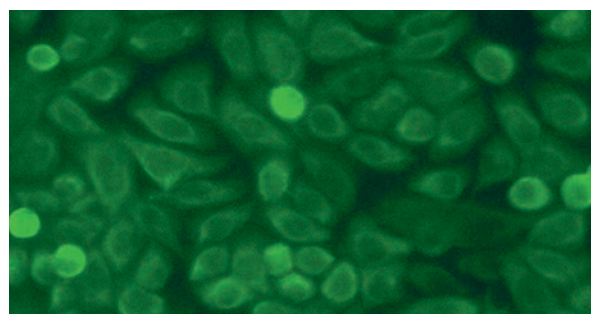
- Breast cancer
- Cellular function and differentiation
- Physiology
- Toxicology
- Hormone regulation and response

■ 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 SingleQuots™ 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 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 |
|---|------|
| RAFT™ 3D Culture System | 272 |
| CytoSMART™ System | 268 |
| Nucleofector™ Kits for Human Mammary Epithelial Cells | 226 |

Neural Cells and Media

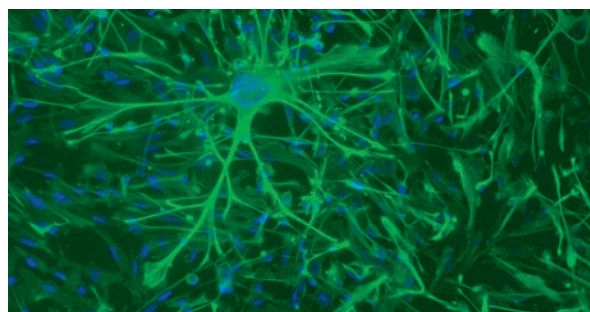
Clonetics™ Neural Cells are used to study the function of the central nervous system and how neural cells interact in normal tissue. Astrocytes are glial cells found in the brain and spinal cord that play a critical role in maintenance, support and repair of nervous tissue.

■ 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

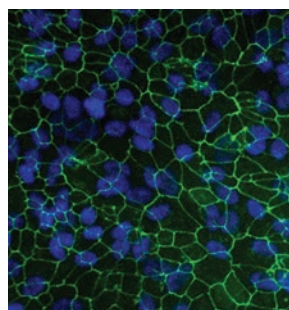
Primary RPE cells are hexagonal cells that are densely packed with pigment granules. They play a critical role in visual function and photoreceptor viability.

■ Source

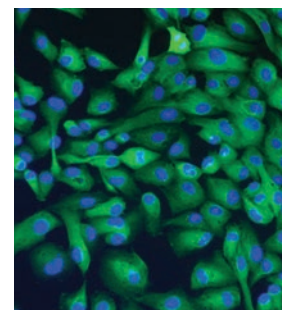
- Human eye tissue

■ 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 ≥90% positive for pancytokeratin marker, ≤10% positive for fibroblast contamination, ≥90% for tight junction marker and ≤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™ | ≥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

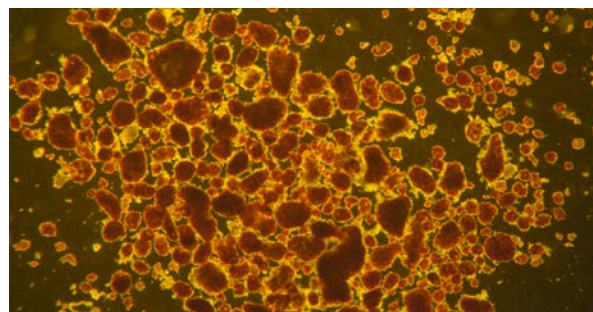
- Islet grafting survival
- Immunosuppression
- Insulin production
- Cell metabolism
- Diabetes (Type I and Type II); hypoglycemia

■ Cell Testing and Specifications

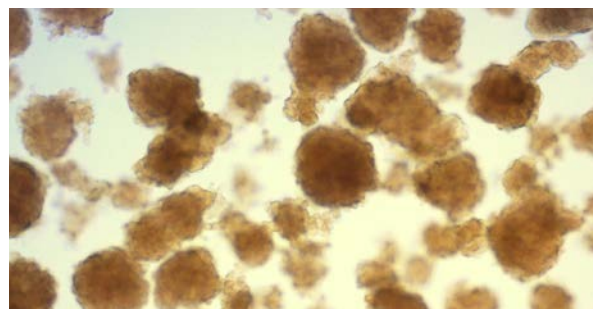
- Islets are tested for IEQ count, sterility, purity and viability prior to shipment. Each batch tests negative for HIV-1, Hepatitis B and Hepatitis C.

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

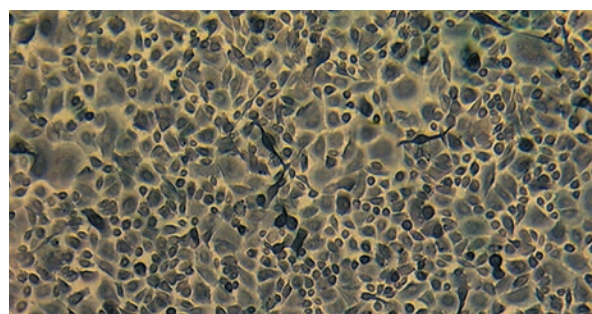
- Prostate epithelial, stromal and smooth muscle tissue depending on cell type

■ Applications

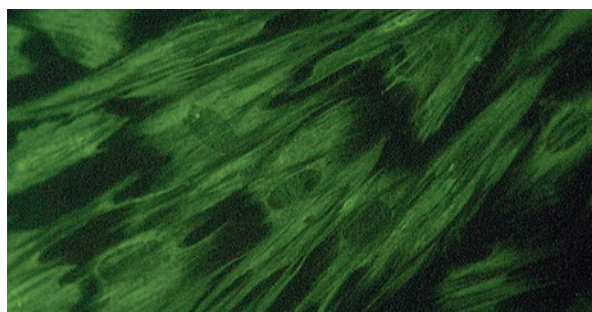
- Physiology
- Drug discovery
- Cancer research
- Procreation research

■ 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

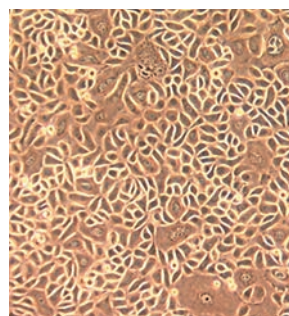
- Human small airway epithelial cells isolated from the distal portion of the lung in the 1 mm bronchiole area
- Human bronchial/tracheal epithelial cells isolated from the epithelial cells that line the airway around the bifurcation of the lungs
- Small vessel endothelial cells are isolated from lung 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

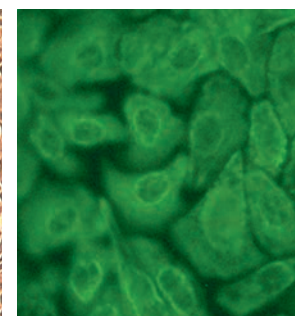
- | | |
|---------------------------------|-------------------------|
| – Cystic fibrosis | – Respiratory distress |
| – Idiopathic Pulmonary Fibrosis | – Oncology |
| – Respiratory disease | – Inhalation technology |
| – Air/Liquid interface | – Asthma |
| – COPD | – Basic research |
| | – Drug uptake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

■ Cell Testing and Specifications

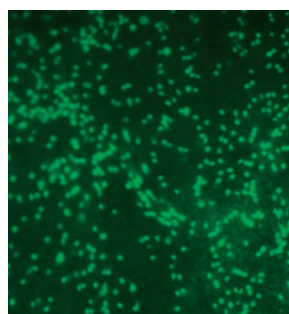
- **Human bronchial/tracheal epithelial cells and small airway epithelial cells** – Characterized by morphological observation throughout serial passage and SAEC stain positive for cytokeratin 19, both are guaranteed through 15 population doublings when using Clonetics™ Media and Reagents
- **Human lung 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



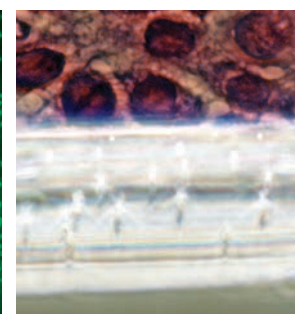
NHBE – Excellent packed cuboidal morphology



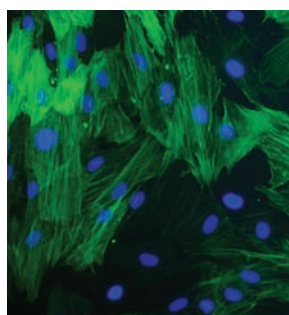
SAEC – Stained for Cytokeratin 19 (green)



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 SingleQuotes™ 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 SingleQuotes™ Supplements and Growth Factors | Frozen supplements | Kit |
| CC-3170 | CC-3170 | BEGM™ Bronchial Epithelial Cell Growth Medium BulletKit™ | Includes basal medium and SingleQuotes™ 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 SingleQuotes™ 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 SingleQuotes™ 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 SingleQuotes™ Kit, only sold as BulletKit™ Medium | Kit |
| CC-3132 | CC-3132 | FGM™ 2 Fibroblast Growth Medium-2 BulletKit™ | Includes basal medium and SingleQuotes™ Kit | Kit |
| CC-3131 | CC-3131 | FBM™ Fibroblast Basal Medium | | 500 mL |
| CC-4126 | CC-4126 | FGM™ 2 Fibroblast Growth Medium-2 SingleQuotes™ Supplements and Growth Factors | Frozen supplements | Kit |
| CC-3124 | CC-3124 | EGM™ Endothelial Cell Growth Medium BulletKit™ | Includes basal medium and SingleQuotes™ Kit | Kit |
| CC-3121 | CC-3121 | EBM™ Endothelial Cell Basal Medium | | 500 mL |
| CC-4133 | CC-4133 | EGM™ Endothelial Cell Growth Medium SingleQuotes™ Supplements and Growth Factors | Frozen supplements | Kit |
| CC-3162 | CC-3162 | EGM™ 2 Endothelial Cell Growth Medium-2 BulletKit™ | Includes basal medium and SingleQuotes™ 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.

| Related Products | Page |
|--|------|
| CytoSMART™ System | 268 |
| Nucleofector™ Kits for Primary Mammalian Endothelial Cells | 224 |
| Nucleofector™ Kits for Human Bronchial Epithelial Cells | 225 |
| Nucleofector™ Kits for Primary Mammalian Epithelial Cells | 227 |
| 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)

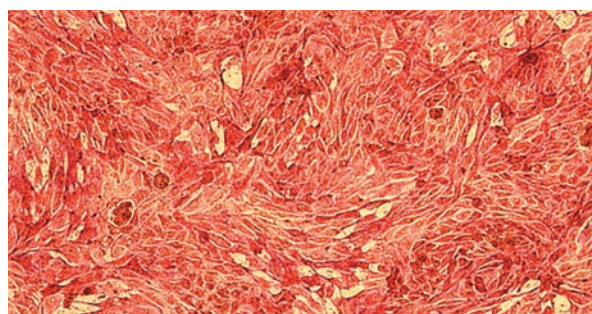
Applications

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

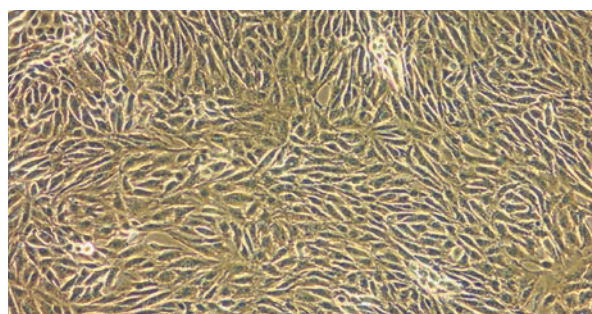
- Physiology
- Cancer research
- Cytokine production
- Cellular function differentiation
- Glomerulonephritis
- Prostaglandin activity
- Toxicology
- Phagocytosis of immune complexes

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.

| Related Products | Page |
|---|------|
| CytoSMART™ System | 268 |
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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

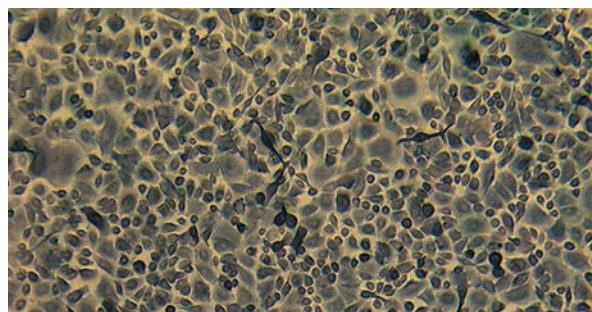
- Human male and female reproductive systems including prostate, and uterine tissue

■ 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 Epithelial Cells | 227 |
| 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

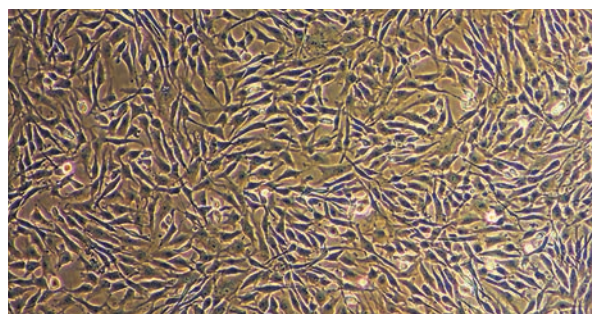
- Human osteoblasts are sourced from spongy bone tissue, and human articular chondrocytes are isolated from the knee joint. Fibroblasts are sourced from the periodontal ligament

■ Applications

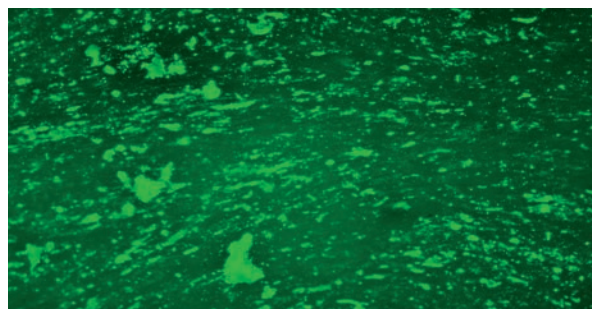
- Physiology
- Joint degeneration
- Fibrosis
- Joint replacement
- Bone repair
- Bone formation
- Bone disease
- Osteoporosis

■ 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 SingleQuots™ Kit | Kit |
| CC-3226 | CC-3226 | CDM™ Chondrocyte Differentiation Basal Medium | | 250 mL |
| CC-4408 | CC-4408 | CDM™ Chondrocyte Differentiation Medium SingleQuots™ Supplements and Growth Factors | Frozen supplements | Kit |
| CC-3216 | CC-3216 | CGM™ Chondrocyte Growth Medium BulletKit™ | Includes basal medium and SingleQuots™ Kit | Kit |
| CC-3217 | CC-3217 | CBM™ Chondrocyte Basal Medium | | 500 mL |
| CC-4409 | CC-4409 | CGM™ Chondrocyte Growth Medium SingleQuots™ Supplements and Growth Factors | Frozen supplements | Kit |
| CC-3207 | CC-3207 | OGM™ Osteoblast Growth Medium BulletKit™ | Includes basal medium and SingleQuots™ Kit | Kit |
| CC-3208 | CC-3208 | OBM™ Osteoblast Basal Medium | | 500 mL |
| CC-4194 | CC-4194 | OGM™ Osteoblast Growth Medium Differentiation SingleQuots™ Supplements and Growth Factors | Frozen supplements | Kit |
| CC-4193 | CC-4193 | OGM™ Osteoblast 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.

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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| CytoSMART™ System | 268 |
| Human MSCs | 29 |
| Human Osteoclast Precursors | 25 |
| OsteolImage™ 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

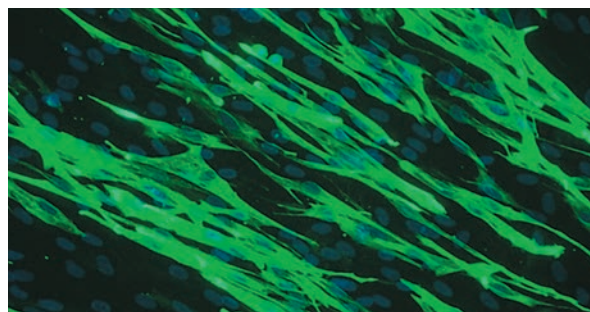
- Human skeletal muscle cells are isolated from the upper arm or upper leg, and human skeletal muscle myoblasts are isolated from post-gestational tissue, usually from quadriceps or psoas tissue. Our human skeletal muscle myoblasts are available
- from normal, Type I, or Type II diabetic donors.

Applications

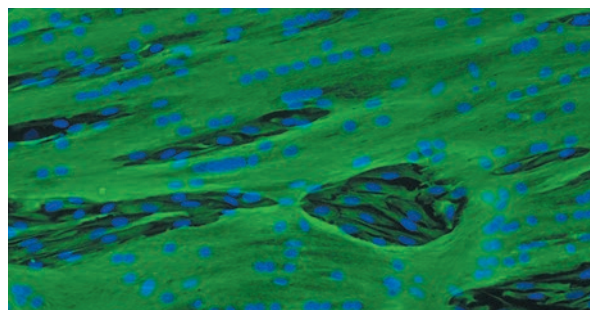
- Gene expression
- Receptor mediated function
- Differentiation
- Neuromuscular disease research
- Ion transport
- Diabetes
- Myopathy

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 counterstained with DAPI (blue)



Differentiated HSMM stained positive for Desmin (green) and counterstained 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.

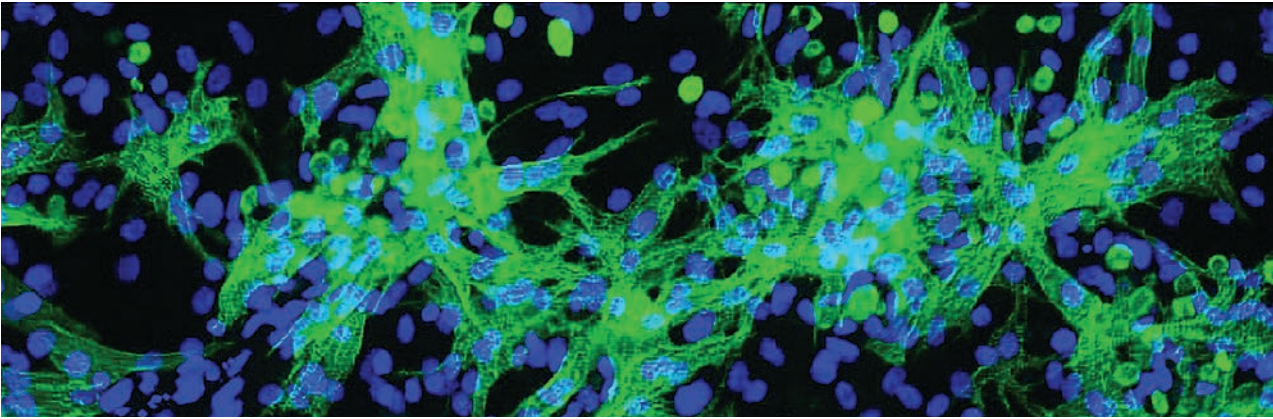
| Related Products | Page |
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Notes

2

Primary Cells and Media

Clonetics™ Animal Primary Cells and Media



| | |
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| Clonetics™ Animal Primary Cells and Media | |
| Introduction | 90 |
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| Fibroblasts Cells and Media | 93 |
| Neural Cells and Media | 94 |
| Ocular Cells and Media | 97 |
| Skeletal Cells and Media | 98 |
| 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

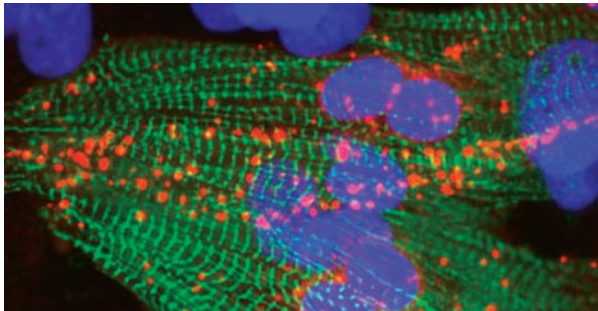
- Rat cardiac myocytes are isolated from neonatal Sprague Dawley rat hearts (ventricular tissue)
- Rat aortic smooth muscle cells are isolated from the aorta of 150–200 gram adult male Sprague-Dawley rats

■ 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 ≥85% purity. When thawed and cultured, you will obtain ≥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 ≥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 |
|---|------|
| CytoSMART™ System | 268 |
| 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

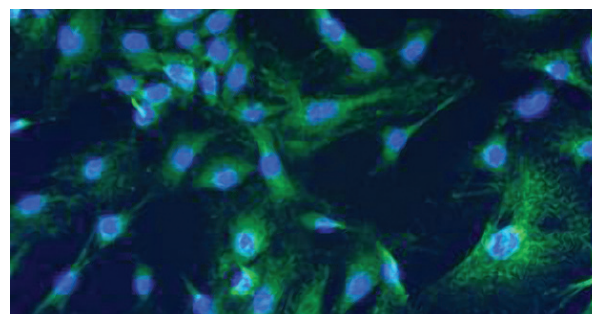
- Mouse primary embryonic fibroblasts dissociated from day 14 and 15 post-coitus CD-1 mouse embryos, expanded and then cryopreserved as frozen primaries. They have not been treated with mitomycin-C

■ 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

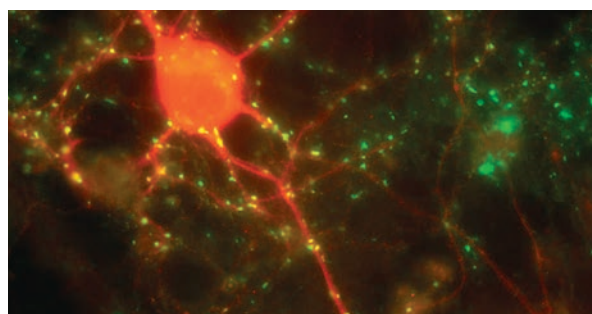
- Primary rat neurons isolated from rat brain as a native mix of high quality primary embryonic brain neuronal cells (including glia)
- Rat astrocytes are obtained from rat brain, passaged once, and cryopreserved
- Primary mouse neurons and astrocytes are isolated from two different mouse strains: C57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

■ Applications

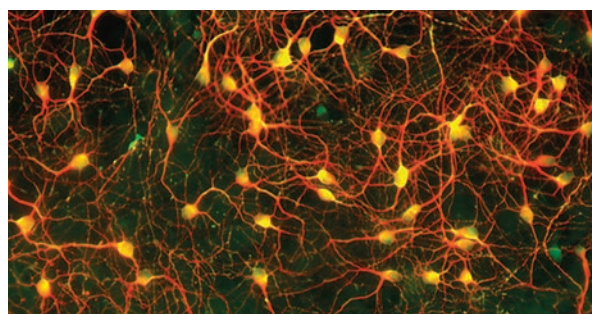
- Transfection
- Evaluation of electrophysiological properties, neurotransmitters, receptor function
- Research typical inhibitory or excitatory ion-channels
- Receptor signaling research
- Intracellular transport studies
- Neurotoxicity research

■ 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)



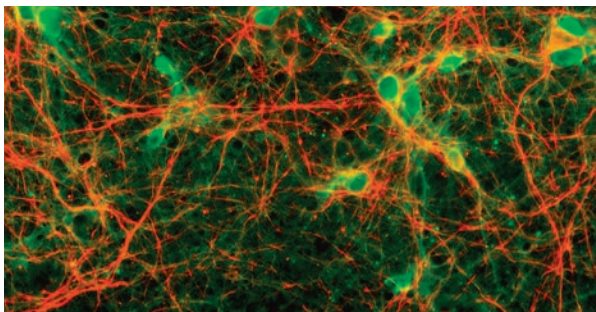
Rat cortical neuronal cells were thawed, cultured 14 days, and immunofluorescently stained with anti-PGP 9.5 and anti β -tubulin

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

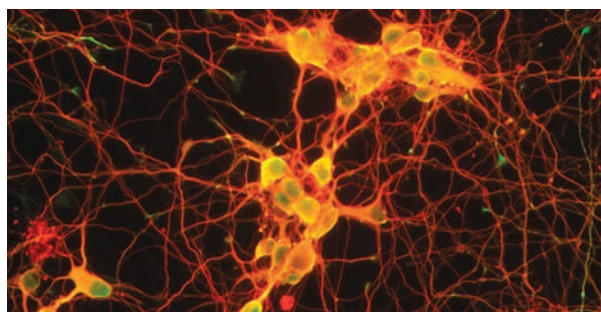
- **Mouse neurons** – Are available isolated from the hippocampus, cortex, or striatum of the brain. These neurons are cryopreserved immediately after isolation without culturing. Each vial (1.0 mL) of mouse cortex or striatum neurons contain approximately 4 million viable cells. Each vial (0.25 mL) 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 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-4512 | CC-4512 | PNGM™ A Primary Neuron Growth Medium – Adult BulletKit™ | Includes basal medium and SingleQuots™ Kit | Kit |
| CC-4511 | CC-4511 | PNGM™ A Primary Neuron Growth Medium – Adult SingleQuots™ Supplements and Growth Factors | Frozen supplements | Kit |
| 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-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

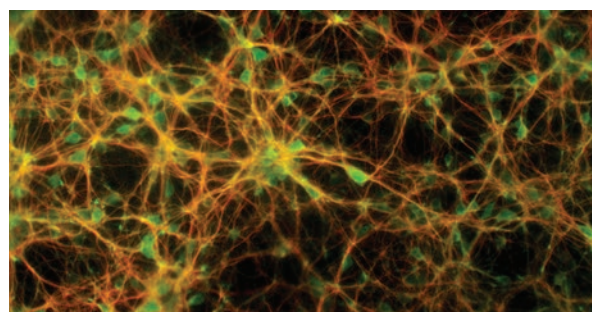
The vertebrate retina is a light sensitive tissue lining the inner surface of the eye. Light strikes the retina, creates an image and initiates a cascade of chemical and electrical events that ultimately trigger nerve impulses. These impulses are sent to visual centers of the brain through the fibers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

Source

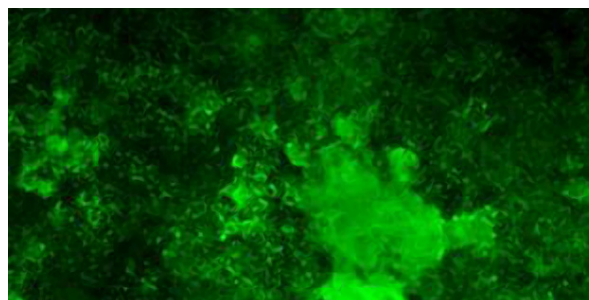
- Rat calvariae osteoblasts dissociated from Sprague-Dawley rat embryos (E20, E21)

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 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. | 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.

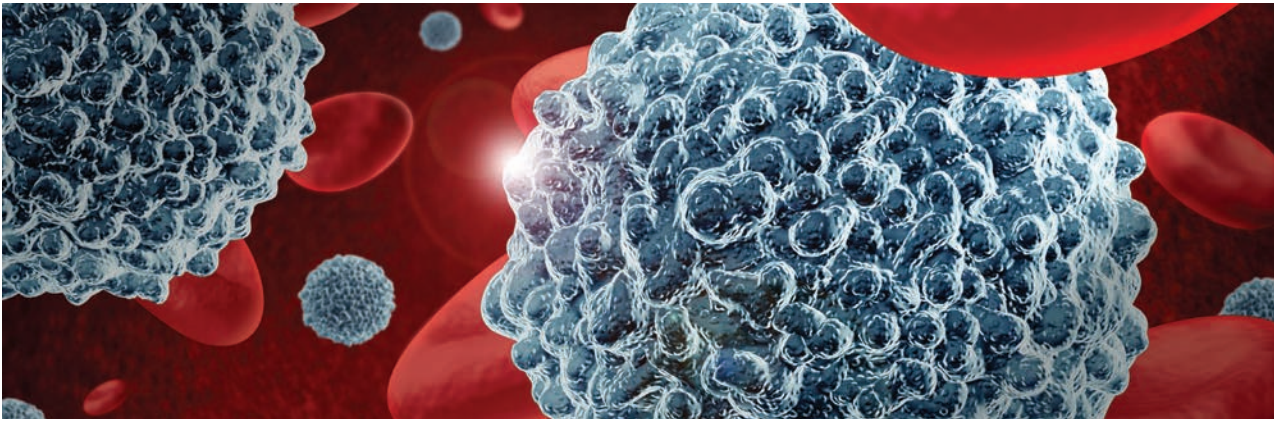
Ordering Information – Growth Factors

| 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

| | |
|--|-----|
| Introduction | 101 |
| Fresh Human Bone Marrow | 102 |
| Bone Marrow and Cord Blood Hematopoietic Cells | 103 |
| Peripheral Blood Immune Cells | 105 |

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

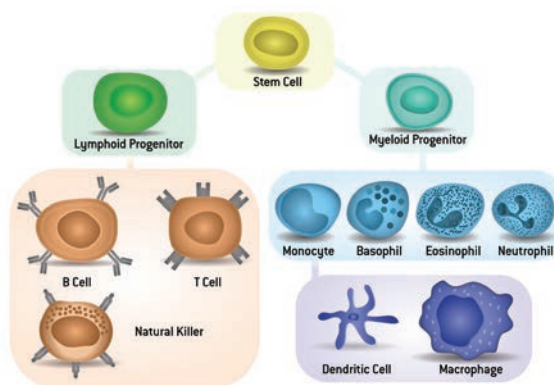
CD34⁺ cells are known to differentiate into all the various blood cell types. In addition, there is a positive correlation between the concentration of CD34⁺ cells and the likelihood of hematopoietic reconstitution upon transplantation. Thus, whether you are focusing on cell therapy research or drug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

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| 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

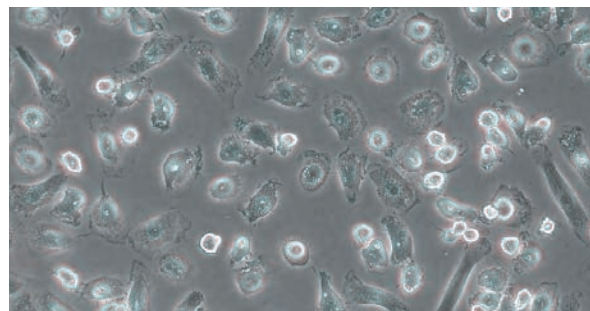
Monocytes play an important role in host defense as circulating monocytes and can also differentiate into tissue macrophages as well as antigen-presenting dendritic cells.

- 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

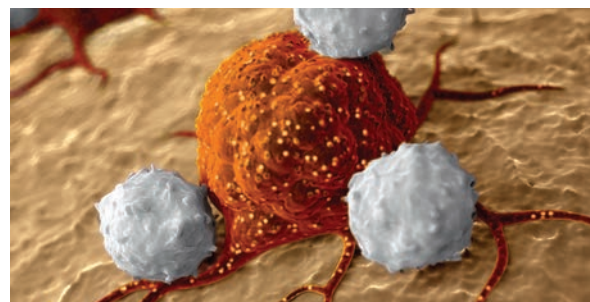
CD4⁺ T Cells

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

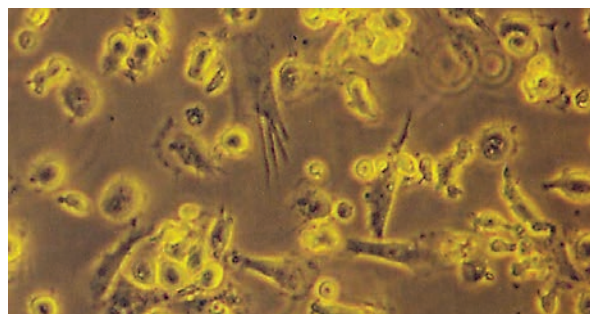
*Guarantee/guaranteed means Lonza will replace or refund the applicable portion of the purchase on terms more fully described at www.lonza.com/hematopoiesis

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 |

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| Nucleofector™ Kits for Human T Cells | 214 |