

The Corning® Guide to Surface Selection by Cell Type

The right surface — right from the start

The development and normal functioning of cells depends on interactions with molecules in their microenvironment. To create physiologically relevant *in vitro* models that support normal cell growth and function, the components of the *in vivo* environment must be incorporated. Use of extracellular matrix (ECM) proteins (natural, synthetic, or mimetic) as coatings on the cultureware allows the development of cell type specific model systems which more closely mimic *in vivo* conditions. Use the Corning selection guide to help you choose the best surface for your application and cell type.

The numbers in the following tables refer to the applicable document references, which are listed at the end of this document.

For product information, please refer to the Corning Surfaces Brochure (CLS-C-DL-AC-006) or visit www.corning.com/lifesciences/advancedsurfaces.

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Primary Cells

Primary Cells	Extracellular Matrices (ECMs) and Biological Coatings													ECM Mimetics and Advanced Surfaces				Enhanced TC-treated Surfaces				
	Cell-Tak™	Collagen I	Collagen IV	Matrigel® Matrix	Fibronectin	Gelatin	Laminin	Osteopontin	Poly-Lysine (PDL, PLL)	PDL/LM and PLO/LM	PuraMatrix®	Vitronectin	PureCoat™ ECM Mimetic Fn	PureCoat ECM Mimetic COL I	Synthemax® Surface	Ultra-Low Attachment	Osteo Assay Surface	Laminin-521 (Human)	Primaria™	CellBIND® Surface	PureCoat Amine	PureCoat Carboxyl
Aortic endothelial cells, BAEC		1		2, 3	4		4					5										
Bile duct cells (epithelial)		6		7																		
Bone marrow cells (bone resorption, osteoclast)																8-10						
Brain microvessel (endothelial)		11, 12	12	13	12	14	12					12										
Cardiomyocytes; cardiac (endothelium, progenitor cells)		15		16	17		18		19		20								21			22
Colonocytes (epithelial)			23	24											25							
Dorsal root ganglia				26, 27				28	29													
Embryonic cortical neurons				30							31											
Embryonic sympathetic neurons			32	33		32					32											
Endothelial cells; endothelial colony forming cells			34		34, 35		34						36	36					37			
Erythrocyte culture (parasite development stages [asexual, sexual])	378			379																		
Hepatocytes		38, 386, 387	39, 387	40, 387			387		41		42								43, 44	45		
Hippocampal neurons				46, 47	48		46, 48		46, 49, 50	49, 50	47, 51											
Human periodontium (periodontal ligament)	52																					
Human osteoclast precursors (osteoclast, pit formation)																53, 54						
HUVEC (endothelial)		55, 56		57, 58	56, 59-61	62	56	63			64	56, 58, 61							61			
HVSMC				58			65					58										
Keratinocytes		66, 67		67	67, 68						51	68		315		69						
Mammary epithelial cells; breast cells (luminal, myoepithelial and endothelial)		70, 71, 73		71, 72			74				71					75						
Microvascular, BME (endothelial)		76	77	78	79, 80	76, 81					82	80										
Mouse splenic T-cells	83		84	84																		
Muscle cells, myoblasts, myogenic cells, myotubes				85			86													87		
Neuronal cells (cortical, cerebellar granule, astrocytes, sensory, sympathetic)			88				88, 89		90-98	99											100	
Oligodendrocytes (glial; precursors)				101			102		101, 103			102										
Osteoblasts		104									105	104										
Pancreatic islet, neonatal (3- to 5-day-old) rat islets of langerhans	106			107	106											108						22
Parotid acinar cells	109			110																		
Peripheral blood mononuclear cells		111, 112	113	114	112-114							113				115	116					
Postnatal mouse vestibular ganglion neurons	117																					
Schwann cells (glial)			118	118			118				119											
Sertoli cells (spermogenic)	120			121, 122																		
Skeletal muscle cells (myocytes, myotubes)				123															124	125		
Smooth muscle cells (endothelial, aortic, vascular)	373	126	126	127	126, 128														129			
Urothelial cells		130	130	131	132																	
Valvular interstitial cells					133																	
Zygote and blastocyst development stages	375																					

Cell Lines (transformed or transfected)

Cell Lines	Extracellular Matrices (ECMs) and Biological Coatings											ECM Mimetics and Advanced Surfaces					Enhanced TC-treated Surfaces						
	Cell-Tak™	Collagen I	Collagen IV	Matrigel® Matrix	Fibronectin	Gelatin	Laminin	Osteopontin	Poly-Lysine (PDL, PLL)	PDL/LM and PLO/LM	PuraMatrix®	Vitronectin	PureCoat™ ECM Mimetic Fn	PureCoat ECM Mimetic COL I	Synthemax® Surface	Ultra-Low Attachment	Osteo Assay Surface	rLaminin-521 (Human)	Primaria™	CellBIND® Surface	PureCoat Amine	PureCoat Carboxyl	
ARH-77 (lymphoblast)					255																		
BHK-21 (fibroblast)					61	256					61								61		257, 258		
Breast cancer cells (established cell lines)	259, 260			261, 262				259															
C2C12 (myoblast)		263		264							265					266							
Cell immobilization (Gin-1, Nasal epithelial cells, Molt-4 and K562 human leukemia cells, Sf9 Cells)	267-270																						
Chinook Salmon Embryo Cells (CHSE-214)																				271			
CHO, CHO-1, CHO-K1 (epithelial, endothelial, transfected fusion protein)				272, 273				274		51		275						276	277, 278	22			
COS-7 (fibroblast, transfected)		279		280	279			281, 282			279							283					
Dorsal Root Ganglia (transfected)				284							285												
H1299 (transfected- human non-small cell lung carcinoma cell line)				286	287																		
HEK-293 (transfected, epithelial), EcoPack2™-293, HEK-SRATet cells, Living Colors HEK-ZsGreen proteasome sensor (transfected)	288	289, 290		291		291		274, 292		51					293			294	295, 296	258, 297		297	
HeLa										51												22	
HepG2 (hepatocyte), Hep3B (hepatoma)		299		300						51	377				301				125	258	258		
HT-1080 (epithelial)		302, 303	304, 305	302											307, 308							258	
hFOB 1.19, MG63 (osteoblast cell lines)				309-311	312		313			311	312				314								
Human MOLT-4, drosophila S2 (biomaterial and tissue engineering applications)	374																						
Keratinocytes (human neonatal)		315, 316			316								315										
L929 (fibroblast, transfected)				317			318			319													
LnCAP (prostate cancer cell line)		307		320											307				296		257, 258		
MCF7 (epithelial)		321	322		323						322				324								
MCF-10A (epithelial)		71, 325		71, 325 - 328	329, 330		330, 331		332	71	330				333								
MDA-MB-231		302, 307, 334	322	302, 326, 335-339	322, 334	322	334	334			322				307, 324								
MDA-MB 435		340		338, 339, 341, 342							343												
MM41 (skeletal myoblasts, transfected)		344																					
MRC5																						257	
N2AB-1 (neuroblastoma)	385																						
NIH/3T3, 3T3 (fibroblast)				345	346, 347			349		51													
PC-3, PC-12		350, 307		351, 390			352	348, 353, 354	355	47, 51	365							356	357	22	22		
RTG-2 (rainbow trout gonad cells)				358																271			
RAW 264.7 (macrophage; osteoclast differentiation, pit formation)			359				359									360, 361							
SH-SY5Y		362	362	363			364		364	51	365												
SK-MEL-28			366		366, 367		366				367												
U266 (lymphoblast)					255																		
U937 (monocyte)		368					369				370				371								
Vero cells												275	275										

Stem and Progenitor Cell Expansion

	Cell-Tak™	Collagen I	Collagen IV	Matrigel® Matrix	Fibronectin	Gelatin	Laminin	Osteopontin	Poly-Lysine (PDL, PLL)	PDL/LM and PLO/LM	PuraMatrix®	Vitronectin	PureCoat™ ECM Mimetic Fn	PureCoat ECM Mimetic COL I	Synthemax® Surface	Ultra-Low Attachment	Osteo Assay Surface	rLaminin-521 (Human)	Primaria™	CellBIND® Surface	PureCoat-Amine	PureCoat Carboxyl
Stem and Progenitor Cells	Extracellular Matrices (ECMs) and Biological Coatings												ECM Mimetics and Advanced Surfaces				Enhanced TC-treated Surfaces					
Human embryonic stem cell (hESC)			134	135	134		134					134			135	136		392		134, 137		
Human induced pluripotent stem cell (hiPSC)				138, 139											138			393				
hMSCs (bone marrow derived, adipose derived)					140			140				140	141	140, 142						397		
Human retinal progenitor cells (RPE)					143									143								
rESC; rat endothelial progenitor cells						144						145, 146				144						
Neuronal stem cell (intestinal/enteric)					147		147									147						

In Vitro Differentiation of Pluripotent Stem Cells

Stem Cells	Extracellular Matrices (ECMs) and Biological Coatings												ECM Mimetics and Advanced Surfaces				Enhanced TC-treated Surfaces					
hESC (cerebral organoid model)				148																		
hESC (pancreatic)				149		150																
hESC, hiPSC (cardiomyocytes)				149, 151-153		154									135			394				
hESC, hiPSC, mESC (Germ Cell Layers: ectoderm, mesoderm, endoderm; hematopoietic progenitor; definitive differentiation; cardiomyocytes)		155, 228	156	135, 138, 139, 158, 159	157	160		161, 162				157		135, 138, 159, 163		157		393				
hESC, hiPSC, mESC, miPSC (endothelial)	164	165		164, 166, 167				164														
hESC, hiPSC (intestinal organoids)				168, 169												147						
hESC, hiPSC (neuronal)				149, 170, 171	170		170, 172		170	173	175	170				174, 176		393				
hESC (osteogenic)						177																
hESC, hiPSC (smooth muscle)				170, 178	170		170		170			170										
hESC, mESC (lung epithelial)		179		179, 180		182										181						
hESC, mESC, rESC (hepatocyte, hepatocyte-like)		183		170, 183-186	170	187	170		170			170				183						
Human NPCs (differentiation to neuronal cells)				188			189				188-190							393				
hPSCs, mPSCs (renal progenitor cells, renal tubular cells, endoderm)		155		191, 192												192						
mESC (hematopoietic)	164			164			164															
mESC, Chicken (cardiomyocytes)		165, 193		193	165	154, 194, 195	165															
mESC, rESC, miPSC (neuronal, progenitor)				188	188, 196	197, 198	188, 199		200		188					198						
mPSCs (inner ear sensory epithelia)				201																		
hESC, hiPSC (retinal pigment epithelial)				396										395								

In Vitro Differentiation of Adult Stem Cells

Stem Cells	Extracellular Matrices (ECMs) and Biological Coatings													ECM Mimetics and Advanced Surfaces				Enhanced TC-treated Surfaces				
	Cell-Tak™	Collagen I	Collagen IV	Matrigel® Matrix	Fibronectin	Gelatin	Laminin	Osteopontin	Poly-Lysine (PDL, PLL)	PDL/LM and PLO/LM	PuraMatrix®	Vitronectin	PureCoat™ ECM Mimetic Fh	PureCoat ECM Mimetic COL I	Synthemax® Surface	Ultra-Low Attachment	Osteo Assay Surface	rLaminin-521 (Human)	Primaria™	CellBIND® Surface	PureCoat Amine	PureCoat Carboxyl
hADSCs; adipose (endothelial)				202												203						
Cardiac progenitor cells (cardiomyocyte)		204					205	204				205				206						
Colon (epithelial organoids)		207		169, 208												209						
Hair follicle (melanocytes, neurons, smooth muscle)				210	210																	
Hepatic progenitor cells (hepatic, biliary cells)							211									212						
Intestinal (organoids, crypt-villus)		213		214-216																		
Keratinocytes (epidermal)		217				217																
Lung (sphere)				218												219						
Mammary epithelial cells				220 - 222												222						
MSC (cardiomyocyte, chondrocyte, hematopoietic, hepatocyte, neuron, osteocyte, spheroid)		141, 223-227, 232		223, 225, 229, 230	140, 223-225, 229, 231		223, 224	140				233-237	140, 232			238, 239						
MSC (endothelial progenitors)		240										240				144						
Muscle (skeletal)							241															
Neural progenitor/stem cells (neuron, astrocytes, neuroblast)				243		198	189, 243					244	189, 190, 242, 245-247			198						
Pancreatic (endocrine)			249	248, 250			249															
Prenatal rat cells (neuron, glial cells)							251															
Retinal (retinal neuron)												252										
Salivary gland				253																		
Stomach (gastric units)				254																		

3D Cell Culture Applications

Applications	Extracellular Matrices (ECMs) and Biological Coatings											ECM Mimetics and Advanced Surfaces				Enhanced TC-treated Surfaces						
	Cell-Tak™	Collagen I	Collagen IV	Matrigel® Matrix	Fibronectin	Gelatin	Laminin	Osteopontin	Poly-Lysine (PDL, PLL)	PDL/LM and PLO/LM	PuraMatrix®	Vitronectin	PureCoat™ ECM Mimetic Fn	PureCoat ECM Mimetic COL I	Synthemax® Surface	Ultra-Low Attachment	Osteo Assay Surface	rLaminin-521 (Human)	Primaria™	CellBIND® Surface	PureCoat Amine	PureCoat Carboxyl
4T1 (mouse breast cancer cell line)				372																		
Cardiac fibroblast		376																				
Hep3B (hepatoma; toxicity/drug screening)		321																				
MCF-7 (epithelial)		321													324							
MCF-10A (epithelial)		71		71, 326						71					333							
MDA-MB-231		302, 307		302, 326											307, 324							
MDA-MB-361				326																		
HeLa				391											298							
HT-1080 (epithelial)		302, 307		302, 303											307							
hESC, Rat (endothelium)		145, 380		146						240					381							
Human melanoma cell lines SBCL2 (RGP), WM-115, (VGP) and 451-LU (MM) and keratinocytes (spheroid model)		382																				
Mouse embryonic pancreatic progenitors (organoid)				383																		
MSCs, Ovarian cancer cells (OCC)				384											384							
N2AB-1 (neuroblastoma)	385																					
Primary rat hepatocytes				387						42												
Rat hepatocyte progenitor cells (spheroid)										42, 388												
SK-MEL-28 cells				306																		
MEFs (stromal fibroblast)				372																		
U266 (lymphoblast)				389																		

The data in this surface selection guide has been derived from published papers accessed through NCBI databases, as well as various web references. This guide will be periodically updated as additional literature becomes available.

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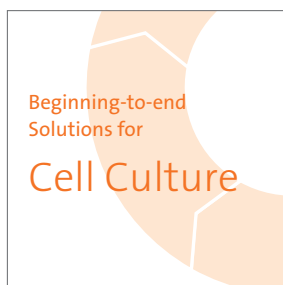
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