

PRIMARY CELLS TESTED ON CCC

The Collagen Cell Carrier® (CCC) is a universal scaffold for adherent primary cells and stem cells for *in vitro* and *in vivo* use. It creates a natural environment for cell attachment, growth and differentiation in applications ranging from simple cell monolayer cultures to the reconstruction of complex 3D tissue cultures on top of the membrane.

As a universal matrix, the CCC facilitates the development of cell-based assays with authentic cell performance. Strong and biocompatible it also serves perfectly as a cell-supporting, suturable carrier for pinpointed cell implantation.

ORGAN & CELL TYPE	HUMAN	MURINE	RAT	CANINE	PORCINE	BOVINE
 Heart & vascular system						
Neonatal cardiac fibroblasts				✓ ¹		
Embryonic cardiomyocytes			✓ ²			
Neonatal cardiomyocytes			✓			
Cardiomyocytes	✓					
Embryonic ventricular myocytes			✓			
Cardiac microvascular endothelial cells	✓ ^{2, 3}					
 Eyes						
Cornea endothelial cells			✓			✓
Cornea epithelial cells	✓		✓			
Iris pigment epithelial cells						✓
Retinal pigment epithelial cells						✓
 Bone & cartilage						
Osteoblast differentiated from adipose-derived MSCs	✓ ⁴					
Chondrocytes	✓					
Chondrocytes differentiated from adipose-derived MSCs			✓ ⁵			
Meniscus cells	✓ ⁶					
 Nervous system						
Astrocytes		✓				
Fetal dopamine neuronal cells			✓			
Fetal neocortical neuronal cells			✓			
Dorsal root ganglion neuronal cells			✓			
Enteric neuronal cells	✓					
 Liver & pancreas						
Hepatocytes		✓				
Pancreatic cells		✓				
 Skin						
Keratinocytes		✓ ⁷				
Epidermal keratinocytes (hEKs)	✓ ⁸					
Melanocytes from hair follicle	✓ ⁹					
 Urogenital tract						
Urothelial cells	✓ ^{10, 11, 12}	✓			✓ ¹⁰	
 Stem cells						
Nucleus pulposus (NP) cells	✓ ¹³					
Dental pulp pluripotent-like stem cells (DPPSC)	✓ ¹⁴					
Mesenchymal stem cells (different tissues)	✓ ^{2, 3, 15, 18}		✓ ^{16, 17}		✓ ¹⁷	

Not sure how your cells will perform on the CCC? Need support with cell detachment or staining?



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LITERATURE



Heart & vascular system

- ¹Castellano D et al., 2014, A Comparison of Electrospun Polymers Reveals Poly(3-Hydroxybutyrate) Fiber as a Superior Scaffold for Cardiac Repair, Stem Cells and Development, 23(13):1479-1490
- ²Valarmathi M T et al., 2018, Functional Tissue Engineering: A Prevascularized Cardiac Muscle Construct for Validating Human Mesenchymal Stem Cells Engraftment Potential In Vitro, Tissue Engineering Part A, 24(1-2)
- ³Valarmathi M T et al., 2017, A Novel Human Tissue-Engineered 3-D Functional Vascularized Cardiac Muscle Construct, Front Cell Dev Biol, 5:2



Bone & cartilage

- ⁴Jafary F et al., 2017, Osteoblast Differentiation on Collagen Scaffold with Immobilized Alkaline Phosphatase, Int J Organ Transplant Med, 8(4):195-202
- ⁵Szychlińska M A et al., 2017, Engineered cartilage regeneration from adipose tissue derived-mesenchymal stem cells: A morphomolecular study on osteoblast, chondrocyte and apoptosis evaluation, Exp Cell Res 15;357(2):222-235
- ⁶Reboredo J, 2014, Tissue Engineering of a meniscus - from a biomaterial to the implant, PhD thesis, University of Würzburg



Skin

- ⁷Kröger C et al., 2013, Keratins control intercellular adhesion involving PKC- α -mediated desmoplakin phosphorylation, J Cell Biol, 201(5):681-692
- ⁸Jannasch M et al., 2015, Development and application of three-dimensional skin equivalents for the investigation of percutaneous worm invasion, Experimental Parasitology 150:22-30
- ⁹Savkovich V et al., 2012, Melanocytes from the Outer Root Sheath of Hair Follicles Cultivated on Collagen Membrane Improve their Melanotic Properties, J Tissue Sci Eng, 5:11



Urogenital tract

- ¹⁰Vaegler M et al., 2015, A Bovine Collagen Type I-Based Biodegradable Matrix as a Carrier for Tissue-Engineered Urothelium, J Stem Cell Res Ther, 5:4
- ¹¹Daum L et al., 2015, In Vivo Biocompatibility Testing of a Collagen Cell Carrier Seeded with Human Urothelial Cells in Rats, J Cell Sci Ther, 6:4
- ¹²Aufderklamm S et al., 2017, Collagen cell carriers seeded with human urothelial cells for urethral reconstructive surgery: first results in a xenograft minipig model, World J Urol 35:1125-1132



Stem cells

- ¹³Mern D S et al., 2013, A Combinatorial Relative Mass Value Evaluation of Endogenous Bioactive Proteins in Three-Dimensional Cultured Nucleus Pulposus Cells of Herniated Intervertebral Discs: Identification of Potential Target Proteins for Gene Therapeutic Approaches, PLoS ONE 8(11)
- ¹⁴Núñez-Toldrà R et al., 2017, Dental pulp pluripotent-like stem cells (DPPSC), a new stem cell population with chromosomal stability and osteogenic capacity for biomaterials evaluation, BMC Cell Biology, 18:21
- ¹⁵Schmidt T et al., 2011, Evaluation of a Thin and Mechanically Stable Collagen Cell Carrier, Tissue Engineering Part C: Methods 17(12)
- ¹⁶Araña M et al., 2013, Preparation and characterization of collagen-based ADSC-carrier sheets for cardiovascular application, Acta Biomaterialia, 9(4):6075-6083
- ¹⁷Araña M et al., 2014, Epicardial delivery of collagen patches with adipose-derived stem cells in rat and minipig models of chronic myocardial infarction, Biomaterials 35(1):143-151
- ¹⁸López-Díaz de Cerio A et al., 2021, Preclinical Evaluation of the Safety and Immunological Action of Allogeneic ADSC-Collagen Scaffolds in the Treatment of Chronic Ischemic Cardiomyopathy, Pharmaceutics 13, 1269

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