Supplemental Table S1

Endogenous modulation of extracellular matrix collagen during scar formation after myocardial infarction

David Schumacher[1,2,3], MD, Adelina Curaj[3,4], MD, Mareike Staudt[3], Sakine Simsekyilmaz[3], Isabella Kanzler[3], PhD, Peter Boor[5,6,7], MD, PhD, Barbara Mara Klinkhammer[5], PhD, Xiofang Li[3], PhD, Octavian Bucur[8,9], MD, Adnan Kaabi[4], Yichen Xu[4,10], Huabo Zhang[4,10], Pakhwan Nilcham[4], Alexander Schuh[4], MD, PhD, Mihaela Rusu[4#*], PhD, Elisa A. Liehn[4,8,10#*], MD, PhD

[1]Department of Anesthesiology, University Hospital, RWTH Aachen University, 52074 Aachen, Germany.
[2] Institute of Experimental Medicine and Systems Biology, RWTH Aachen University, 52074 Aachen, Germany.
[3] Institute for Molecular Cardiovascular Research (IMCAR), RWTH Aachen University, 52074 Aachen, Germany.
[4] Department for Cardiology, Angiology and Internal Intensive Care, Medical Faculty, RWTH Aachen University, Germany
[5] Institute for Pathology, RWTH Aachen University, 52074 Aachen, Germany.
[6] Division of Nephrology and Clinical Immunology, RWTH Aachen University, Germany.
[7] Institute of Molecular Biomedicine, Comenius University, Bratislava, Slovakia
[8] National Institute of Pathology "Victor Babes", Bucharest, 050096 Bucharest, Romania
[9] Viron Molecular Medicine Institute, 1 Boston Place, Ste 2600, Boston, MA 02108, USA
[10] Institute for Molecular Medicine, University of Southern Denmark, 5230 Odense, Denmark

Supplemental Table S1. *Collagen subtypes: current state of art*

Type	Polymerrized form	Gene(s)	RefSeqGene	Tissue distribution	Pathways	Reference(s)
I	fibril	COL1A1	LRG_1 on chromosome 17	Internal organs, bones, teeth, tendons, ligaments, skin, cornea,	1. ECM-receptor interaction 2. Platelet activation	[1-3][22-26]

					3. Relaxin signaling pathway 4. Inflammatory Response Pathway 5.Focal adhesion 6. 3. PI3K-Akt signaling pathway 7. Protein digestion and absorption	
		COL1A2	LRG_2 on chromosome 7	Artery wall, endomysium of myofibrils, scar tissue	1.Cell surface interactions at the vascular wall 2. GPVI-mediated activation cascade 3. Platelet activation, signaling and agregation. 4. Relaxin signaling pathway 5. ECM-receptor interaction 6. Inflammatory Response Pathway 7.Focal adhesion 8. 3. PI3K-Akt signaling pathway	[1, 2],[27-29]

II	fibril	COL2A1	chromosome 12	cartilage, vitreous humour, notochord, intervertebral disc	1. integrin cell surface interactions 2.Signaling by PDGF 3.Signal transduction 4. Focal Adhesion 5. ECM-receptor interaction. 6. 3. PI3K-Akt signaling pathway	[1-3]
III	fibril	COL3A1	LRG_3 on chromosome 2	blood vessels, skin, lung, uterus, intestine, granulation tissue	1. integrin cell surface interactions 2.Inflammatory Response Pathway 3.Platelet Aggregation Inhibitor Pathway, Pharmacodynamics 4.NCAM1 interactions 5.Signaling by PDGF 6.Signal transduction 7. Protein digestion and absorption	[1, 2], [30,31]

IV	network-forming (integral components of basement membranes)	COL4A1 COL4A2	chromosome 13	all basal lamina, eye lens, capillaries, glomerular basement membranes	1.Focal Adhesion 2. ECM-receptor interaction 3. PI3K-Akt signaling pathway 4. Relaxin signaling pathway	[2, 3], [32-35]
		COL4A3 COL4A4	chromosome 2		1.Integrin cell surface interactions 2. Signaling by PDGF; 3.Signal transduction 4. ECM-receptor interaction 5. Focal Adhesion 6. Relaxin signaling pathway 1. ECM-receptor interaction 2. Focal Adhesion 3. Relaxin signaling pathway	
		COL4A5 COL4A6	chromosome X			

V	fibril (with type I)	COL5A1	chromosome 9 NG_008030.1	as type I, bone matrix, , placenta , corneal stroma, the interstitial matrix of muscles, liver, lungs	1.NCAM1 interactions 2.Signaling by PDGF 3. Signal transduction 4. regulating integrin-dependent activation of cardiac fibroblasts 5. Protein digestion and absorption	[1, 2], [36-38]
		COL5A2	chromosome 2 NG_011799.3		1.Focal adhesion 2. Protein digestion and absorption	
		COL5A3	Chromosome 19 NG_046943.1		1. Focal adhesion 2. Protein digestion and absorption	
VI	beaded filament collagen	COL6A1	chromosome 21 (21q22.3)	as type I, interstitial tissue, skeletal muscle, lung, kidney, cornea, tendon, dermis, cartilage, intervertebral discs, blood vessels, adipose tissue. Interface between the basement membrane and interstitial matrix	1.NCAM1 interactions 2. Signaling by PDGF 3. Signal transduction 4. Focal adhesion 5. ECM-receptor interaction 6. PI3K-Akt signaling pathway 7. Protein digestion and absorption *Col6a1-may promote	[39-41]

		COL6A2	Chormosome21 (21q22.3)		macrophage migration and polarization via AKT and PKA pathways	
		COL6A3	chromosome 2 (2q37)		1.ECM receptor interaction 2. Focal adhesion 3. PI3K-Akt signaling pathway 4. Protein digestion and absorption	
		COL6A4 (The α4 chain is absent in humans)	pseudogenes due to a chromosome break			
		COL6A5	chromosome 3 (3q22.1)		1.ECM receptor interaction 2. Focal adhesion 3. PI3K-Akt signaling pathway 4. Protein digestion and absorption	
		COL6A6	Chormosome3 (3q22.1)	α6 chain -rich in the endomysium, perimysium of skeletal muscle, myocardium	1.ECM receptor interaction 2. Focal adhesion 3. PI3K-Akt signaling pathway	

VII	anchoring fibrils	COL7A1	chromosome 3	rectum, colon, small intestine, placenta, esophagus, oral mucosa, cervix, skeletal muscle, skin, cornea -forms anchoring fibrils beneath stratified squamous epithelia	- Involve in stability of interstitial membrane (binds to type I and type III collagen), basement membrane ECM structures.	[4],[42]
VIII	network-forming	COL8A1	Chormosome3 (3q11.1-q13.2)	bone, cartilage, brain, eye, kidney, heart, vascular tissues, liver, lung, muscle, skin, spleen, nerves, ligaments and tendons,	Involve in angiogenesis, tissue remodeling, fibrosis Col8a1- promotes smooth muscle cells proliferation and migration	[5],[43,44]
	nonfibrilar	COL8A2	chromosome 1 (1p34.2-p32.3)			
IX	fibril-associated collagen with interrupted triple helices (FACITs)	COL9A1	chromosome 6	cartilage with type II and XI fibrils; chondrocytes of growth-plate cartilage, articular cartilage in adult, inner ear, intervertebral discs	1.ECM receptor interaction 2. Focal adhesion 3. PI3K-Akt signaling pathway	[1, 2], [41,45]

				-form the unique heterofibril network in the matrix of cartilage by combine with types II and XI collagen		
		COL9A2	chromosome 1		1.NCAM1 interactions 2.Signaling by PDGF 3.Signal transduction 4. ECM receptor interaction 5. Focal adhesion 6. PI3K-Akt signaling pathway	
		COL9A3	chromosome 20		1.ECM receptor interaction 2. Focal adhesion 3. PI3K-Akt signaling pathway	
X	network-forming nonfibrillar collagen	COL10A1	chromosome 6	growth plate (hypertrophic zone) and articular cartilage (basal calcified zone)	1.Endochondral Ossification 2.Mineralization 3. Protein digestion and absorption	[2],[46,47]
XI	fibril (with type II)	COL11A1 COL11A2	chromosome 1 chromosome 6	As for type II, skeletal muscle, articular cartilage, intervertebral discs, tendons, trachea,	1.ECM–receptor interaction 2.focal adhesion	[48-50]

		COL11A3	chromosome12	trabecular bone, placenta, testis, lung, neoepithelium of brain	(1,2) Invlove in cancer delvelopement 3. Protein digestion and absorption	
					-involve fibrillogenesis (nucleator for the of type I and II collagen) - inhibit matrix degradation by reducing the release of GAGs in human articular chondrocyte pellets	
XII	fibril-associated collagen with interrupted triple helices (FACIT)	COL12A1	Chromosome 6	Associate with type I collagen, bones, dense conenctive tissue, interstitial matrix, component of skeletal muscle	Protein digestion and absorption - temporarily stabilize type I collagen fibrils, prevents the fibrils from permanently crosslinking	[6],[41,51,52]
XIII	nonfibrillar, type II trans-membrane collagen	COL13A1	Chromosome 10	connective tissues; blood vessels, bone, neuromuscular structures	1.cell adhesion 2.adhesion-dependent cell functions	[7, 8],[53]
XIV	fibril-associated collagen with	COL14A1	Chromosome 8	skin, cornea, articular cartilage, tendon	Fibrillogenesis	[54-55]

	interrupted triple helices (FACIT)					
XV	endostatin precursors collagens	COL15A1	Chromosome 9	cardiac skeletal myocytes, basement membrane of microvessels, small intestine, colon, kidney, pancreas, testes, ovaries, prostate	1.Extracellular matrix organization 2.Assembly of collagen fibrils and other multimeric structures 3. Protein digestion and absorption	[3],[56-58]
XVI	fibril-associated collagens with interrupted triple helices (FACITs)	COL16A1	Chromosome 1	heart, arterial walls, intestine, kidney, skin, cartilage	1.Focal adhesion 2.Integrin mediated signaling pathway 3.extracellular metrix organization 4. Protein digestion and absorption	[9],[59-62]
XVII	non-fibrillar/ type II transmembrane collagen	COL17A1	Chromosome 10	Skin (epithelial hemides-mosomes), colonic mucosa, brain, kidney, placenta, cornea	1.Type I hemidesmosome assembly 2.Cell junction organization 3.Cell-cell comunication 4.a6b1 and a6b4 Integrin signaling 5. Protein digestion and absorption	[3],[63-64]

XVIII	Multiplexin ;Multiple Triple Helix domains with Interruptions	COL18A1	Chromosome 21	fat tissue (during adipose differentiation), basement membrane, eye, articular cartilage, bone marrow, hair follicles , heart, plasma, brain, liver, kidneys	1.Extracellular matrix organization 2.inhibition of angiogenesis 3.inhibition of Wnt/β-catenin signaling and development of the eye 4.Protein digestion and absorption -Endostatin (carboxyl-terminal fragment of type XVIII collagen) bind receptor KDR/Flk-1 interfering with VEGF signaling lead to inhibi-tion of proliferation and migration of endothelial cell. - modulate PDGFR/Erk pathway; reducing TGF-β	[3],[65-68]
XIX	member of the fibril-associated	COL19A1	Chromosome 6 (6q12q14)	breast (basement membrane zones), kidney, liver, colon,	1. extracellular matrix organization	[10, 11],[69-70]

	collagens with interrupted triple helices (FACIT)			placenta, spleen ,prostate, skeletal muscle, skin	2.Protein digestion and absorption	
XX	fibril-associated collagens with interrupted triple helices (FACIT)	COL20A1	Chromosome 20 (20q13.33)	corneal epithelium, tendon, embryonic skin, sternal cartilage	1.Cellular adhesion 2. Cells migration,differentiation, and signaling 3. Protein digestion and absorption	[12],[41, 71]
XXI	fibril-associated collagens with interrupted triple helices (FACIT)	COL21A1	Chromosome 6	heart, lung, kidney, placenta, jejunum, stomach, skeletal muscle, lympnode, pancreas	1.Protein digestion and absorption 2. maintains integrity of extracellular matrix (localized with type I collagen)	[11,13],[41,72-73]
XXII	fibril-associated collagens with interrupted triple helices (FACIT)	COL22A1	Chromosome 8	heart, cartilage and skin	1.The sequences GLQGER and GFKGER are binding motifs between collagen XXII and α2β1 integrin 2. Cell adhesion 3. integrates the junctional extracellular matrix	[14,15],[41,74-75]

XXIII	type II trans-membrane collagen	COL23A1	Chromosome 5	cornea, lung, skin, tendon, amnion, placenta, kidney	may involve in formation or maintenance of cell–cell contacts or epithelial cells polarization	[76-77]
XXIV	fibrillar collagen	COL24A1	Chromosome1 (1p.22.3)	Bone (predominantly), brain, muscle, kidneys, liver, spleen, lung, testis, ovary	1. Involve in collagen fibril organization 2. Involve in ECM organization -known as marker of osteoblast differentiation and bone formation	[16],[41,78]
XXV	membrane-associated collagens with interrupted triple helices (MACITs)	COL25A1	Chromosome 4	neurons of the brain (predominantly), heart, testis, retina senile plaques of Alzheimer's disease	1. involved in cell–cell, cell–matrix adhesion 2.involved in fibrillization and cell toxicity 3. potential play role in Alzheimer's-disease (protects against proteolysis of amyloid β-peptides)	[17],[41,79-80]

XXVI	does not fit within any of the collagen family subgroups but contained collagenous domains	COL26A1 (EMID2)	Chromosome 7	testis, ovary	-may involve as extracellular matrix component of early development of testis and ovary	[18],[81-83]
XXVII	third class (type C) fibrillar collagen	COL27A1	Chromosome 9 (9q32)	Cartilage in adult, epiphyseal growth plate in children and adolescents. During fetal development; in major arteries of the heart, endochondral bone, lungs, ear, colon, retina, cornea	structural role in the pericellular extracellular matrix of the growth plate, organisation of the proliferative zone	[19, 20],[84]
XXVIII	collagens containing von Willebrand factor	COL28A1	Chromosome 7 (7p21.3)	peripheral nerves, glial cells, dorsal root ganglia, nodes of Ranvier	1. Cell adhesion 2. ECM organization -may involve in repair process	[21],[85-87]

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