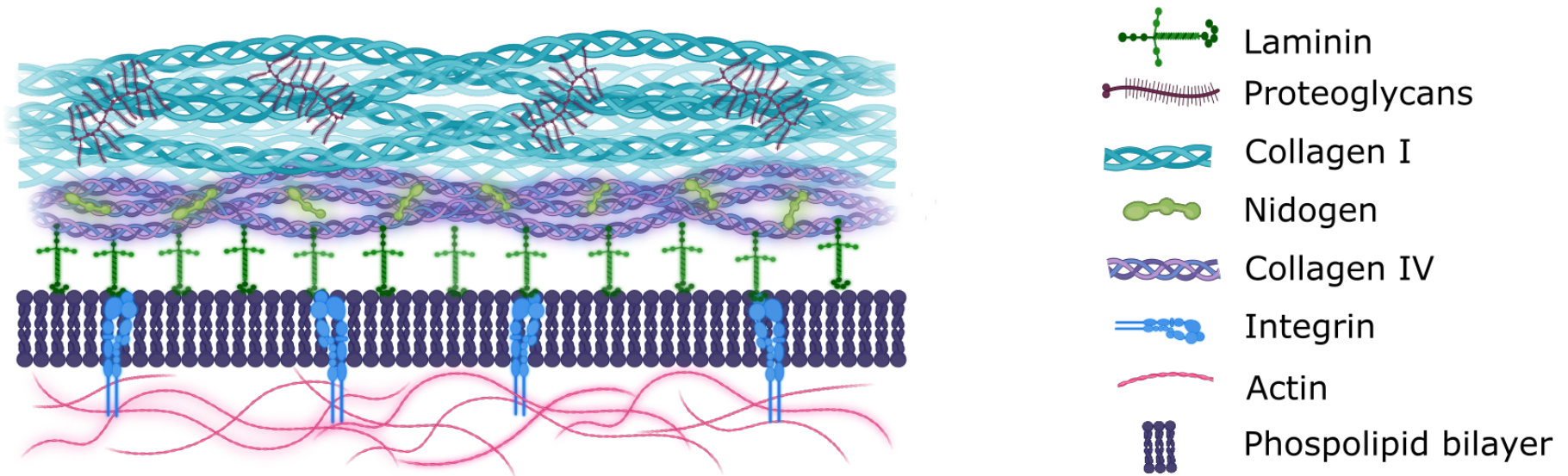


## SUPPLEMENTAL MATERIALS

Role of extracellular matrix components and structure in new renal models *in vitro*

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### Supplemental Figure 1



**Figure S1.** The extracellular matrix is mainly composed of proteoglycans, hyaluronic acid and collagen I. Proteoglycans are a core protein to which GAGs are attached, like hyaluronic acid. Proteoglycans have an important role in different biological functions, and they also interact with growth factors and take part in cell signaling. Collagen I is a fibril-forming collagen, and it is involved in the organization and the architecture of the specific tissue. Nidogen, collagen IV and laminins are part of the basal membrane. Laminins interweave with collagen IV network and nidogen acts as a connector or linking protein. Integrins are heterodimeric receptors that connect the ECM and the cytoskeleton. A licensed version of BioRender was used to prepare this figure.

## Supplemental Tables

**Supplementary Table 1.** ECM components and their natural and synthetic surrogates

Component	Molecular nature	Application	References
<b>Individual ECM/BM components</b>			
Collagens			
<ul style="list-style-type: none"> <li>Collagen I</li> </ul>	Isolated fraction, purified	2D Coating	(34,63)
		2.5 D	(11)
		3D Hydrogel	(23,68,74)
		Bioprinting	(105)
<ul style="list-style-type: none"> <li>Collagen IV</li> </ul>	Isolated fraction, purified	2D Coating	(34,60)
<ul style="list-style-type: none"> <li>Jellyfish Collagen 0 (Jellagen)</li> </ul>	Isolated fraction	3D scaffold	<a href="https://www.biotrend.com/en/brand/Jellagen">https://www.biotrend.com/en/brand/Jellagen</a>
Laminins	Recombinant	Coating	(34,60)
Fibronectin	Isolated fraction, purified	Coating	(60)
GAGs			
<ul style="list-style-type: none"> <li>Hyaluronic Acid</li> </ul>	Isolated fraction, purified	3D hydrogel	(85)
<ul style="list-style-type: none"> <li>Heparin</li> </ul>	Isolated fraction, purified	3D hydrogel	(17)
<b>Native ECM/BM extracts</b>			
Matrigel	Unfractionated tissue Extract	2.5D	(11,81)
		Coating	(60)

		3D Hydrogel	(67)
Geltrex	Unfractionated tissue Extract	Coating	(139,141)
NovoGel		Bioprinting	(46)
Specific Renal ECM	Decellularized kidney	Recellularization	(43,114)
		ECM extracts	(88)
		Bioinks	(100,101)
<b>Natural polymers</b>			
Gelbrin		3D Scaffold	(32)
Silk		3D Scaffold	(86,90,91)
<b>Synthetic polymers</b>			
PEG	Monomer solution	Hydrogel	(30,87)
starPEG	Monomer solution	Hydrogel	(17)
EDC	Monomer solution	Hollow fiber hydrogel	(55)
microPES	Monomer solution	Membrane HFM	(52,56)
PCLdi(u-UPy)	Monomer solution	Electrospun membrane	(51)
PES	Monomer solution	Membrane	(13,65)
PCL	Monomer solution	Electrospun polymer scaffold	(57)
Polyester fleece	Monomer solution	Scaffold	(50)
h- FIBER	Monomer solution	HFM	(54)

ECM: Extracellular Membrane, BM: Basal Membrane; GAGs: glycosaminoglycans

Matrigel: murine EHM tumor tissue, Gelbrin: Gelatin-Fibrin, PEG: polyethylene glycol, PEGDA: poly (ethylene glycol) diacrylate biofunctional polymer, EDC: 1-ethyl-3-(3- (dimethylamino)propyl) carbodiimide hydrochloride, HFM: hollow fiber membrane, PES: Polyethersulfone, PCL: polycaprolactone, h-FIBER: Extruded topographic hollow fiber

**Supplementary Table 2.** Commercial solutions for organ-on-a-chip technology

Company	Internet address	Kidney model*
4Dcell	<a href="https://www.4dcell.com/">https://www.4dcell.com/</a>	No
AlveoliX	<a href="https://www.alveolix.com/">https://www.alveolix.com/</a>	No
AxoSim	<a href="https://axosim.com/">https://axosim.com/</a>	No
BEOnChip	<a href="https://beonchip.com/">https://beonchip.com/</a>	Yes
BioIVT	<a href="https://bioivt.com/">https://bioivt.com/</a>	No
BiomimX	<a href="https://www.biomimx.com/">https://www.biomimx.com/</a>	No
Cherry Biotech	<a href="https://www.cherrybiotech.com/">https://www.cherrybiotech.com/</a>	No
Elvesys	<a href="https://www.elveflow.com/">https://www.elveflow.com/</a>	No
Emulate	<a href="https://emulatebio.com/">https://emulatebio.com/</a>	Yes
Ibidi	<a href="https://ibidi.com/">https://ibidi.com/</a>	No
Insphero	<a href="https://insphero.com/">https://insphero.com/</a>	No
MesoBioTech	<a href="https://mesobiotech.com/">https://mesobiotech.com/</a>	No
Mimetas	<a href="https://www.mimetas.com/en/home/">https://www.mimetas.com/en/home/</a>	Yes
Nortis Bio	<a href="https://nortisbio.com/">https://nortisbio.com/</a>	Yes
TARA Biosystems	<a href="https://tarabiosystems.com/">https://tarabiosystems.com/</a>	No
TissUse	<a href="https://www.tissuse.com/en/">https://www.tissuse.com/en/</a>	No

\*Company specifically offers devices or models to model kidney tubule function.