Supplemental table

Material / Hydrogel	Natural / Synthetic / Hybrid? Fibrous?	Elastic modulus (i.e. stiffness)	Viscoelastic? Viscoplastic? Non-linear elastic?	Pore size	Degradable?	Overall view	Refs.
Collagen-1	- Natural ECM - Fibrous	~0.01-1 kPa	- Yes - Yes - Yes	~0.1-10μm	Yes	Widely used for 3D cell culture and as a model of stromal matrix. Properties can be varied by modulating collagen density and increased covalent crosslinking, so that properties are not independently tunable.	1,2
Reconstituted basement membrane (rBM), Matrigel, Geltrex	- Natural ECM - Nonfibrous	~0.02-0.5 kPa	- Yes - Yes - No	~nm	Yes	Widely used for organoid and tumor spheroid culture. High lot-to-lot variability. Stiffness can be increased by increasing rBM density, so that properties are not independently tunable.	3,4
Fibrin	- Natural ECM - Fibrous	~0.01-1 kPa	- Yes - Yes - Yes	~2μm	Yes	Especially relevant for studying wound healing and clot formation. Properties can be varied by modulating fibrinogen density and increased covalent crosslinking, so that properties are not independently tunable.	5
Hyaluronic acid	- Natural ECM; requires modification for crosslinking. - Nonfibrous	~0.01-3.5 kPa	- Yes - Yes - Yes	~nm	Yes	Used particularly in models of brain and cartilage. Various crosslinking chemistries can be introduced to form HA hydrogels. Typically coupled with RGD-cell adhesion peptide motif to promote integrin-adhesions.	6
Alginate	- Natural Biomaterial - Nonfibrous	~1-110 kPa	- Yes - Yes - Yes	~nm	Not susceptible to degradation by mammalian proteases	Can be crosslinked ionically with divalent cations, or covalently crosslinked with various chemistries. Mechanical properties can be independently tuned by varying ionic crosslinking density and molecular weight.	7,8
Polyethylene glycol (PEG)	- Synthetic - Nonfibrous	~1-100 kPa	Depends on crosslinking modality	~nm	Depends on crosslinking modality	Amenable to various crosslinking chemistries. Often coupled to RGD to promote cell adhesion and with MMP degradable crosslinks. Stiffness increased typically by increasing polymer density. Mechanical properties can be temporally tuned.	9,10
Polyacrylamide	- Synthetic - Nonfibrous	~0.5-115 kPa	- No - No - No	~nm	No	Wide mechanical tunability. Shows linearly elastic behavior. Cannot be readily used for 3D cell culture owing to toxicity of precursor solutions.	11
Agarose	- Natural Biomaterial - Nonfibrous	~2-100 kPa	- Yes - Yes - No	~nm	No	Thermosensitive hydrogel. Exhibits nearly linear elastic properties. Mechanical properties varied by modulating polymer concentration.	1

Table: Common hydrogels used for 3D cell culture. Several natural and synthetic hydrogel formulations have been developed with different levels of modularity, mechanical tunability and temporal control of properties.

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