Supplementary Table S1: Functions and recommended concentrations of various components.

Component	Function	Recommended Concentrations	References
ITS-X	ITS-X is listed as one of the common additives used to support cell metabolism and antioxidant function in serum-free media.	1 ×	[1-4]
BFGF	BFGF could promote cell growth, proliferation and wound healing.	1-200 ng/mL	[1,5-8]
BSA	BSA acts as a carrier protein that stabilizes growth factors and hormones in the medium while providing nutrients necessary for cell growth.	0.1-0.5%	[4,6,9]
Y-27632 2HCl	Y-27632 2HCl is a selective inhibitor of ROCK1 and ROCK2, and can reduce apoptosis induced by cell division.	2-10 μM	[8,10,11]
EGF	EGF can promote the proliferation of various cells, including muscle cells, epithelial cells, and endothelial cells.	2-200 ng/mL	[1,6,12,13]
IGF-1	IGF-1 promotes the proliferation and differentiation of skeletal muscle cells during myogenesis.	10-200 ng/mL	[1,12,14]
LIF	LIF can promote cell proliferation and maintenance.	0.1-50 ng/mL	[5,15,16]
Lipids concentration	Lipids play a vital role in serum-free media by serving as essential components for cell membrane structure, energy storage, and signaling pathways.	1 ×	[6]
NEAA	Non-essential amino acids play a significant role in serum-free cell culture by supporting cell growth, metabolism, and protein synthesis.	1 ×	[8]
L-Ascorbic acid	L-Ascorbic acid functions as an effective antioxidant and a cofactor for various enzymatic reactions. It helps mitigate oxidative stress, which is particularly important in the absence of serum-derived protective factors.	1-150 μM	[17,18]
Asc-2P	Asc-2P is a stable derivative of L-Ascorbic acid.	1-150 μM	[19]
Trolox	Trolox is a water-soluble derivative of vitamin E and plays a crucial role in serum-free cell culture by acting as a potent antioxidant.	50 μM	[20]
NAC	NAC acts as a precursor for glutathione synthesis, enhancing cellular antioxidant capacity to mitigate oxidative stress and protect cells from toxin-induced damage in serum-free culture systems.	1-5 mM	[20,21]
Hydrocortisone	Hydrocortisone can modulate glucocorticoid receptor activity and glucose metabolism to support cell survival under stress conditions.	100 nM	[1,6]
Forskolin	Forskolin elevates intracellular cAMP levels, promoting cell differentiation and autophagy, modulates metabolic pathways and receptor activity to support cell survival under stress conditions.	10-100 μM	[22]
HGF	HGF promotes cell survival, growth, motility and morphogenesis	0.1-50 ng/mL	[1,5]
Dexamethasone	Dexamethasone can regulate cell growth and proliferation, suppress inflammatory responses, and enhance cellular responsiveness to other stimuli.	10-500 nM	[1,23]
LPA	LPA enhances cell adhesion and migration, promotes proliferation, and inhibits apoptosis.	5 μM	[24,25]

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