

Materials List for:

Magnetic-Activated Cell Sorting Strategies to Isolate and Purify Synovial Fluid-Derived Mesenchymal Stem Cells from a Rabbit Model

Zhaofeng Jia^{1,2,3}, Yujie Liang^{4,5}, Xingfu Li^{2,3}, Xiao Xu^{1,2,3}, Jianyi Xiong^{2,3}, Daping Wang^{1,2,3}, Li Duan^{2,3}

¹Postgraduate institution, Guangzhou Medical University

²Guangdong Provincial Research Center for Artificial Intelligence and Digital Orthopedic Technology

³Shenzhen Key Laboratory of Tissue Engineering, Shenzhen Laboratory of Digital Orthopaedic Engineering, Shenzhen Second People's Hospital (The First Hospital Affiliated to Shenzhen University)

⁴Department of Chemistry, Chinese University of Hong Kong

⁵Shenzhen Kangning Hospital, Shenzhen Mental Health Center

Correspondence to: Daping Wang at dapingwang1963@qq.com, Li Duan at 825343512@qq.com

URL: <https://www.jove.com/video/57466>

DOI: [doi:10.3791/57466](https://doi.org/10.3791/57466)

Materials

Name	Company	Catalog Number	Comments
Reagents			
MesenGro	StemRD	MGro-500 1703	Warm in 37 °C water bath before use
MesenGro Supplement	StemRD	MGro-500 M1512	Component of MSCs culture medium
DMEM basic	Gibco Inc.	C11995500BT	MSCs differentiation medium
Isotonic saline solution	Litai, China	5217080305	Cavity arthrocentesis procedure reagent
Phosphate-Buffered Saline (PBS)	HyClone Inc.	SH30256.01B	PBS, free of Ca ²⁺ /Mg ²⁺
Fetal Bovine Serum (FBS)	Gibco Inc.	10099-141	Component of MSCs culture medium
Povidone iodine solution	Guangdong, China	150605	Sterilization agent
75% ethanol	Lircon, china	170917	Sterilization agent
0.25% Trypsin/EDTA	Gibco Inc.	25200-056	Cell dissociation reagent
1% Penicillin-Streptomycin	Gibco Inc.	15140-122	Component of MSCs medium
MACS Running Buffer	MiltenyiBiotec	5160112089	Containing phosphate-buffered saline (PBS), 0.5% bovine serum albumin(BSA), and 2 mM EDTA
CD90 antibody conjugated MicroBeads	MiltenyiBiotec	5160801456	For magnetic activated cell sorting
Sodium pyruvate	Sigma-Aldrich	P2256	Component of MSCs chondrogenic differentiation
Dexamethasone	Sigma-Aldrich	D1756	Component of MSCs osteogenic differentiation
ITS	BD	354352	1%, Component of MSCs chondrogenic differentiation
L-proline	Sigma-Aldrich	P5607	0.35 mM, Component of MSCs chondrogenic differentiation
L-ascorbic acid-2-phosphate	Sigma-Aldrich	A8960	50 mM, Component of MSCs chondrogenic differentiation
3-isobutyl-1-methylxanthine	Sigma-Aldrich	I5879	0.5 mM, Component of adipogenic differentiation
Indomethacin	Sigma-Aldrich	I7378	100 mM, Component of adipogenic differentiation

TGFβ1	Peprtech	100-21	10 ng/mL, Component of MSCs chondrogenic differentiation
α-glycerophosphate	Sigma-Aldrich	G6751	Component of MSCs osteogenic differentiation
CD34 Polyclonal Antibody, FITC Conjugated	Bioss	bs-0646R-FITC	Hematopoietic stem cells marker
Mouse antirabbit CD44	Bio-Rad	MCA806GA	Thy-1 membrane glycoprotein (MSCs marker)
CD45 (Monoclonal Antibody)	Bio-Rad	MCA808GA	Hematopoietic stem cells marker
CD105 antibody	Genetex	GTX11415	MSCs marker
Isopropyl alcohol	Sigma-Aldrich	I9030	Precipitates RNA extraction organic phases
Trichloromethane	Wenge, China	61553	Extract total RNA
Trizol	Invitrogen	15596-018	Isolate total RNA
SYBR green master mix	Takara Bio, Japan	RR420A	PCR test
cDNA synthesis kit	Takara Bio, Japan	RR047A	Reverse-transcribed to complementary DNA
Alizarin Red	Sigma-Aldrich	A5533	Staining of calcium compounds
Toluidine Blue	Sigma-Aldrich	89640	Staining of cartilaginous tissue
Oil Red O solution	Sigma-Aldrich	O1391L	Lipid vacuole staining
Equipment			
MiniMACS Separator	MiltenyiBiotec	130-042-102	For magnetic activated cell sorting
MultiStand	MiltenyiBiotec	130-042-303	For magnetic activated cell sorting
MS Columns	MiltenyiBiotec	130-042-201	For magnetic activated cell sorting
Cell Strainer	FALCON Inc.	352340	40 μm nylon
Hemocytometer	ISOLAB Inc.	075.03.001	Cell counting
Falcon 100 mm dish	Corning	353003	Cell culture dish
Microcentrifuge tube	Axygen	MCT-150-C	RNA Extraction and PCR
Centrifuge Tubes	Sigma-Aldrich	91050	Gamma-sterilized
High-speed centrifuge	Eppendorf	5804R	Centrifuge cells
Carbon dioxide cell incubator	Thermo scientific	3111	Cell culture
Real-Time PCR Instrument	Life Tech	QuantStudio	Real-Time quantitative polymerase chain reaction
Flow cytometer	BD Biosciences	342975	Cell analyzer
Pipettor	Eppendorf	O25456F	Transfer the liquid
Cloning cylinder	Sigma-Aldrich	C3983-50EA	Isolate and pick individual cell colonies
Sterile hypodermic syringe	Double-Dove, China	131010	Arthrocentesis procedure
Rabbit cage	Zhike, China	ZC-TGD	Restrain the rabbit