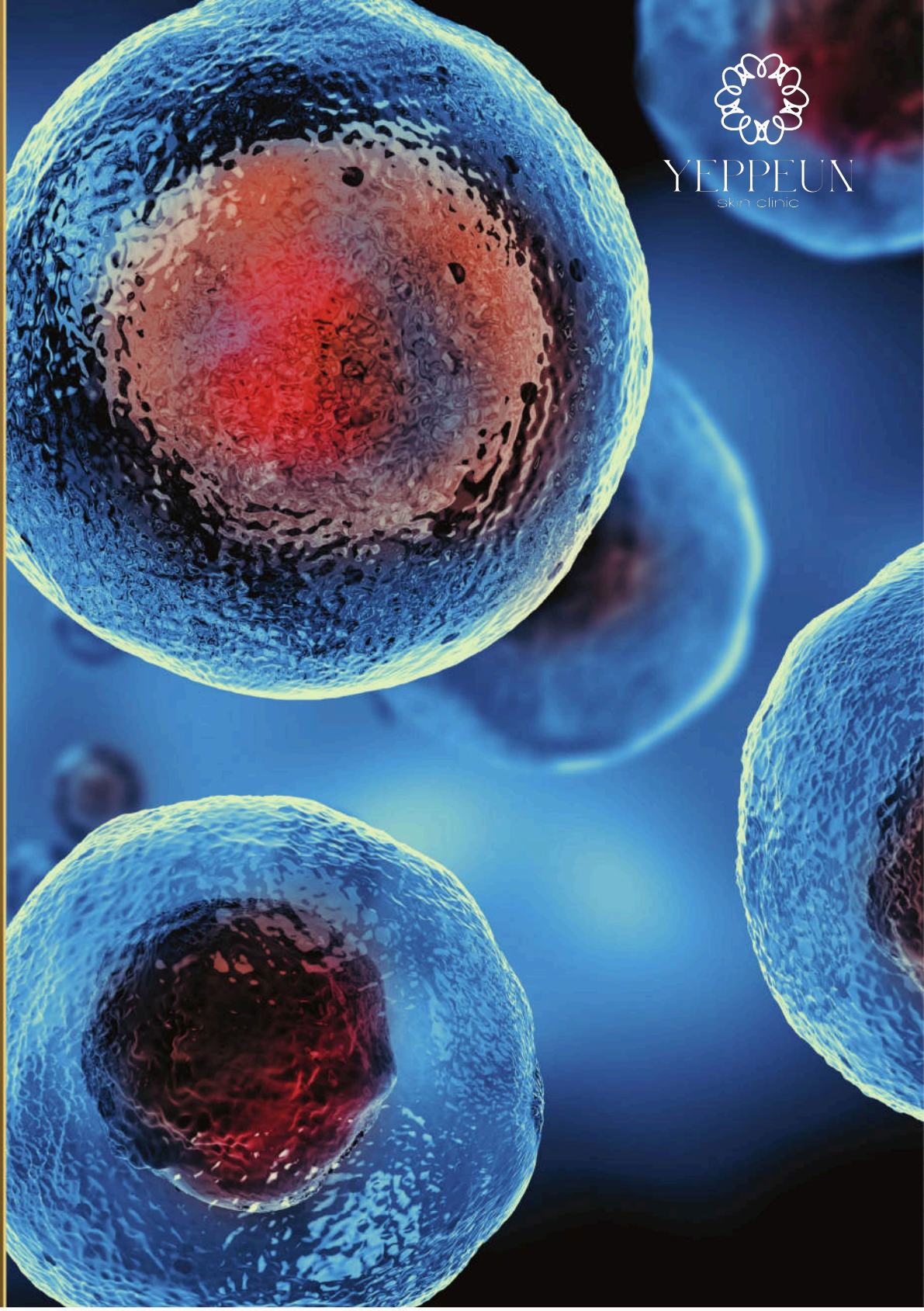
Miracell

at Yeppeun Skin Clinic, Dubai

SMART M-CELL

Bone Marrow and Blood Stem Cell Collecting System

Cartilage Cartridge Origin 99



YEPPEUN skin clinic

The Promising 'Stem Cell Technology'

Smart M-cell is an advanced cell separator developed based on cutting edge technology and is a system that extracts and concentrates superb amounts of living cells from whole blood and bone marrow.

NET 신기술인증 NEW EXCELLENT TECHNOLOGY · FDA · KFDA · CE · GMP · ISO 9001:2015 · ISO 13458:2016

WHATSAPP +971 54 305 0521

WEBSITE yeppeunskinclinic.com

INSTAGRAM @yeppeunskinclinic

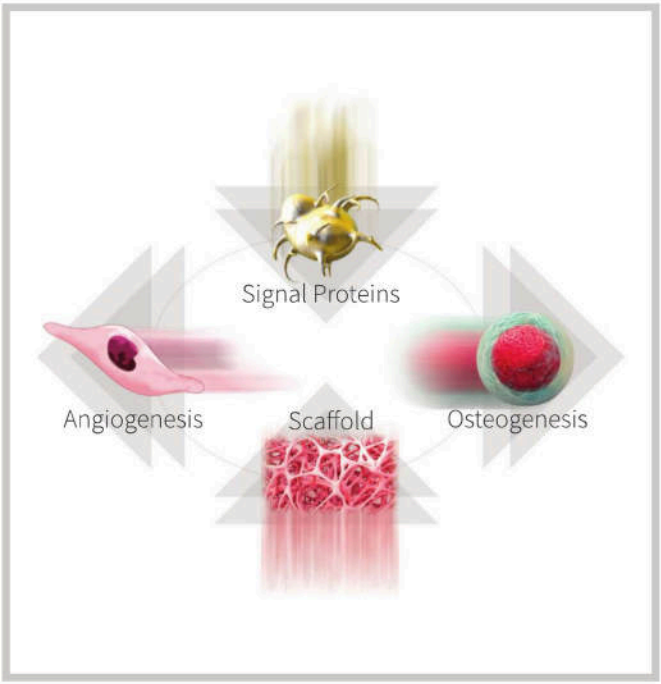
FACEBOOK /YeppeunSkinClinic

YOUTUBE @YeppeunSkinClinic

Villa 124, Al Ghelaan Street, Jumeirah 2, Dubai, UAE

BONE MARROW STEM CELL

All bone formation is determined by endothelial cells, hematopoietic stem cells, mesenchymal stem cells, and their supporting accessory cells recruited at defective sites. Autologous bone marrow stem cells can be the best choice in bone grafting. Bone marrow extracted from the iliac crest is an optimal source of regenerative cells for angiogenesis, bone formation and healing.



Endothelial Progenitor Cells
Stimulate angiogenesis, release BP-2, and BP-6, and up-regulate the production of BP-2

Hematopoietic Stem Cells
Orchestrate bone formation and directly convert to stromal stem cells (CD34+)

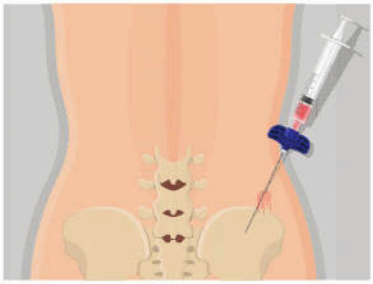
Mesenchymal Stem Cells
Convert to osteoblasts in support of the new bone formation

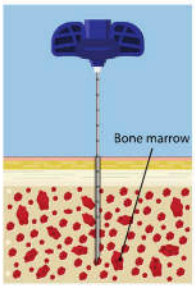
Platelets
Mediate cell-to-cell adhesion through the release of various adhesion and growth factors such as SDF-1a

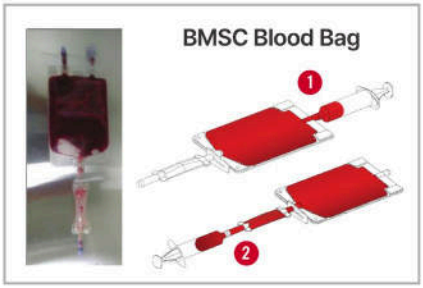
Lymphocytes
Support the migration and proliferation of Endothelial progenitor cells

Granulocytes
Release vascular endothelial growth factors in support of angiogenesis





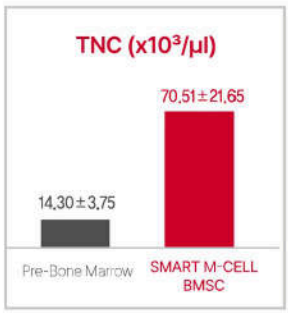


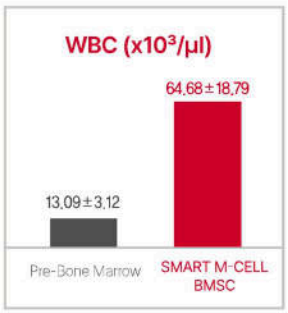


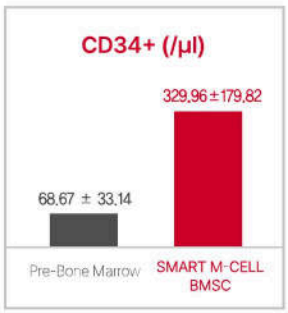
Total Cell Analysis Comparison

(N=10)

Division	Pre-Bone Marrow	SMART M-CELL BMSC
TNC (x10³/μl)	14.30 ± 3.75	70.51 ± 21.65
WBC (x10³/μl)	13.09 ± 3.12	64.68 ± 18.79
CD34+ (/μl)	68.67 ± 33.14	329.96 ± 179.82





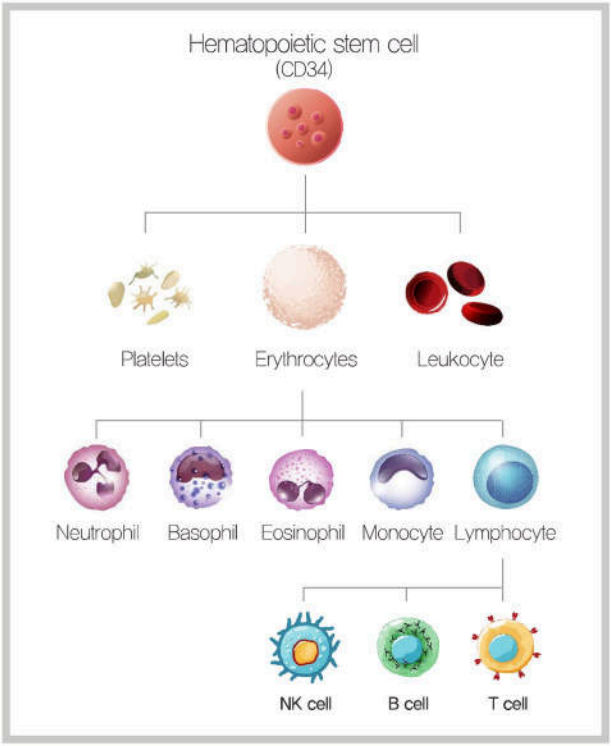


SNUH SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL

(Source: Comparative analysis of blood-derived cell recovery rate in cell separation/concentration using BmSC(Miracell) by Bundang Seoul National University Hospital 2020)

BLOOD STEM CELL

Effective cell therapy requires support for cell migration, progenitor cells that can be converted to bone or soft tissue, and signaling proteins to regulate recovery and regeneration processes. SMART M-CELL provides cells optimized for tissue regeneration and key biological cells, a rich source of protein.



Stem cell

CD34+(Stem Cell Marker) must exist to be clinically effective.

WBC

Sufficient levels of white blood cells are essential for antibodies to prevent infection.
Unlike other devices, the patented separation technology of SMART M-CELL2 reduces granulated WBC and produces more mononuclear cell components. It reduces inflammatory responses and increases the proportion of stem cells relatively.

Growth Factors

Platelet-Derived Growth Factors (PDGF)
Chemo-attractive for stem cells and endothelial cells.
Epidermal Growth Factor (EGF)
Promote cell proliferation, skin graft, wound recovery.
Vascular Endothelial Growth Factors (VEGF)
Stimulates angiogenesis and chemoattractant for osteoblasts.

Platelet

Contains α-granules and responsible for hemostatic processes, stimulates stem cells, and has healing abilities.

Total Cell Analysis Comparison

(N=15)

Division	Blood	SMART M-CELL BSC
Viability (%)	99.5±0.4	99.5±0.2
TNC (x10³/μl)	4.67±1.12	14.53±4.04
Platelets (x10³/μl)	275.0±56.3	1,106.6±225.7
WBC (x10³/μl)	5.3±1.2	15.6±4.6
Lymphocytes (x10³/μl)	1.8±0.4	8.9±2.1
Monocuclear (%)	41.6±6.17	70.48±10.64
Granulocyte (%)	58.40±6.17	29.52±10.64
CD34+ (x10³/μl)	1.84±0.9	11.22±4.7

Cytokine Analysis Comparison

(N=15)

Division (pg/ml)	Blood	SMART M-CELL BSC
PDGF-AB	949±593	24,970±21,404
EGF	27.17±18.7	567.19±665.9
VEGF	26.35±18.08	425.51±499.71
IFN-gamma	47.98±11.14	628.15±300.71

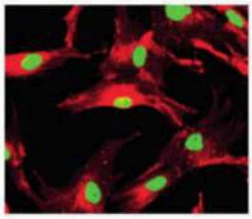
GBSA SCL

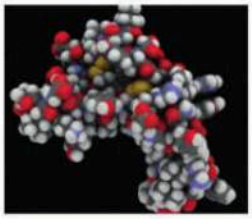
(Source: A Basic Clinical Study on the Validity Assessment Indicators of Domestic Development M-CELL2 Regenerative Medical Devices, GBSA Gyeonggi-do Economic and Scientific Promotion Agency, 2021)

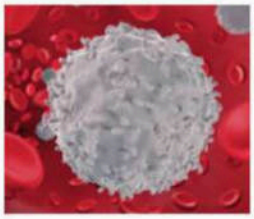
Miracell's **Stem Cell Collecting Technology**

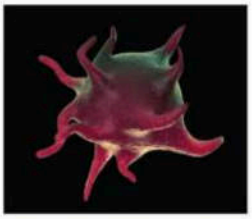
Our body has a natural healing ability but the power of cells is necessary. If we can collect stem cells to be dispersed throughout the body and place them where healing is needed, the healing process will be shortened.

Our technology is to extract living stem cells and growth factors specialized for regeneration and offer the safest autologous stem cell therapy in the world.


Stem Cell

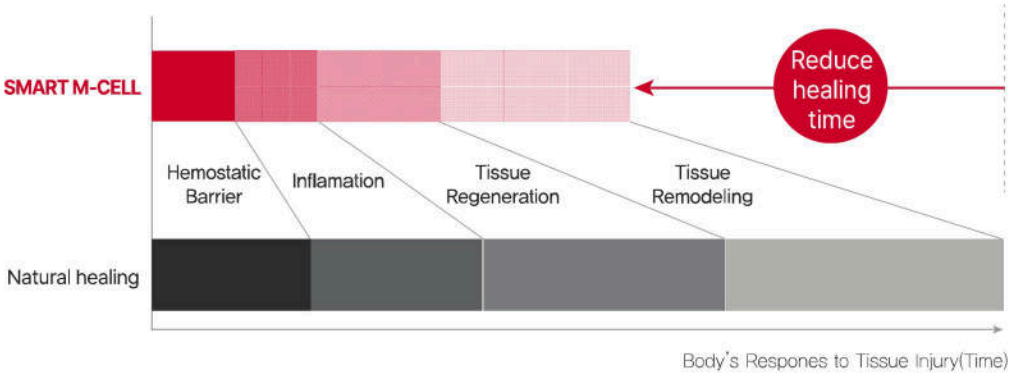

Growth Factors


WBC


Platelet


SDF-1α

Stem cells **reduce healing processes**



| Clinical check points for Stem Cells

SDF-1α
SDF-1α plays an important role in angiogenesis by recruiting endothelial progenitor cells (EPCs) from the bone marrow.

P-selectin value
P-selectin plays an important role in the recruitment of leukocytes (white blood cells) and platelets to the site of injury. Thus, low p-selectin value (Inactivated) is important in treatment.

CD34+
CD34 is a common marker for identifying human hematopoietic stem cells. HSCs can be found in bone marrow, peripheral blood, and umbilical cord blood.

Coefficient of variation
CV shows the variability in relation to the mean of the population. Thus, it is important to have low, constant CV values for reliable treatment

WBC
White blood cells are the cells of the immune system that are involved in protecting the body against both infectious disease and foreign invaders. Unlike other centrifugal machines, Miracell's patented Smart M-Cell enhanced the therapeutic effects and lowered the inflammatory responses by decreasing the number of granulocytes and increasing the number of monocytes during centrifugation.

Know-how for Living Deactivated Cells

NET 신기술인증 NEW EXCELLENT TECHNOLOGY

FDA

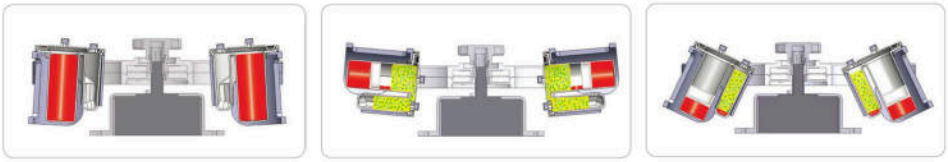
SMART M-CELL is designed to keep most of the cells alive.
The best cell quality gives the best treatment results.

1. Auto-Rotation

The spinning rotor and basket adjust RPM and angles automatically to provide precise isolation and concentration of cells.

2. Double Separate Rotation

First rotation separates RBCs first to prevent stem cell activity concentrates cells that are directly involved in tissue regeneration.



3. Touch Screen and Voice Guide

Intuitive and convenient touch screen and voice guide for the whole process.

4. LED Visible Light



Frequent/Multiple Choice Available

Type	Blue 460mn ~ 475mn	Green 525mn ~ 530mn	Yellow 585mn ~ 590mn	RED 660mn
Characteristic	·Natural purification effect	·Increased immune response	·Improves lymph and blood circulation	·Helps cell growth and collagen formation
Where to Use	·Circulatory system, anti-aging procedures ·Inhibits skin acn proliferation	·Improves immunity, liver function ·Inhibits skin pigment	·Circulatory system, anti-aging procedures	·Orthopedic procedures ·Derma lifting procedures

* Provide option to choose or change the appropriate wavelength for treatment to increase the activity of cells and growth factors.

SMART M-CELL2



Know-how for Clinically Valid Total Cells



SMART M-CELL is not only accelerating the stem cell migration to the wound but it's also promoting the proliferation in microenvironments by selective separated concentrated cells.

1. Isolation Valve

The patented isolation valve is designed to calculate the density of the cells in the blood and bone marrow to prevent damage caused by intercellular friction and to maintain inactivation before treatment.

2. Separated Structure

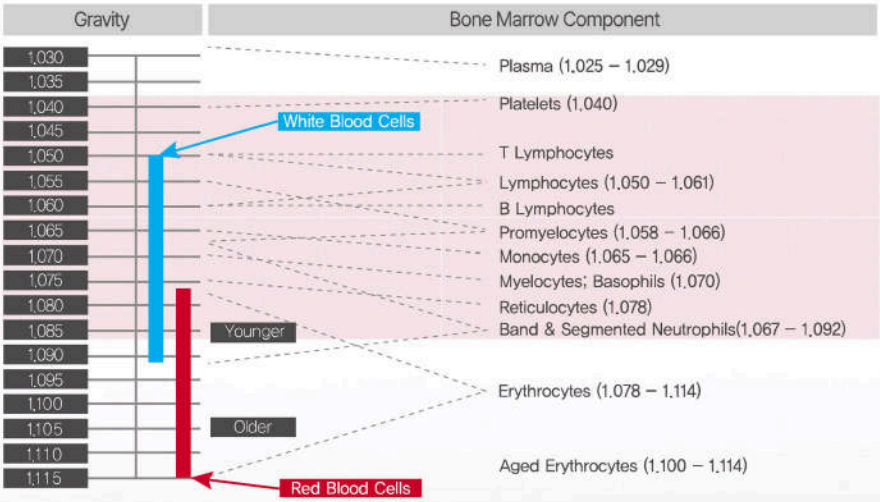
Minimizes cell damage by dividing pre-separated red blood cells and stem cells into separate spaces.

3. Rounded Structure

The rounded structure is designed to eliminate the loss or waste of cell members to be used for treatment.

Specific Gravity and Time Control

Due to the different density of nucleated cells in bone marrow and blood, the specially designed isolation valve for each type allows accurate separation and concentration of nucleated cells from bone marrow and blood.

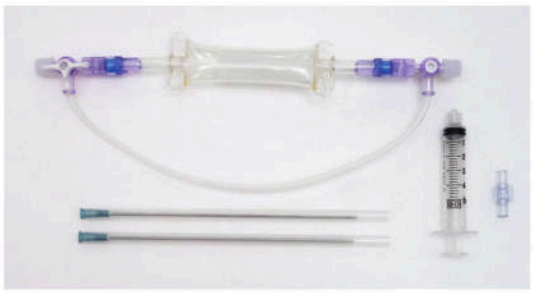


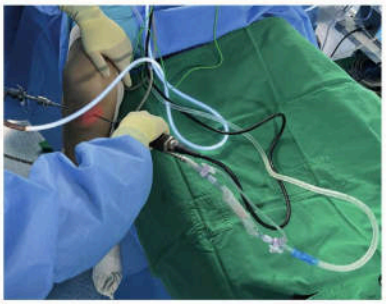
SMART M-CELL4



Autologous Tissue Collector, Cartilage Origin 99

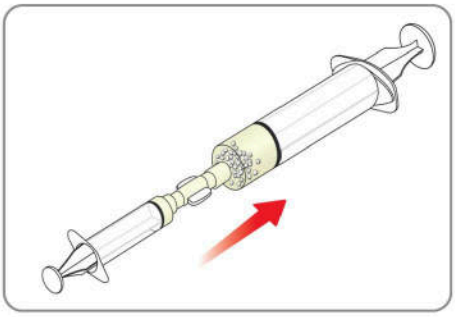
It may be used to enhance cartilage regeneration after implantation in the damaged area by using Autologous tissue collected in the process of collecting the cartilage from damaged areas.



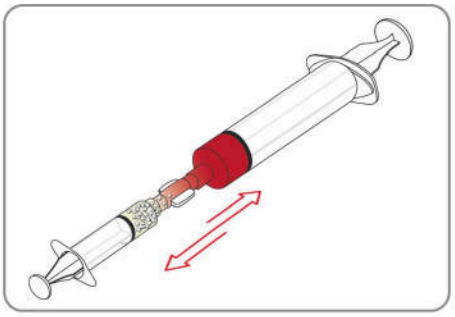
How to use

| For single use



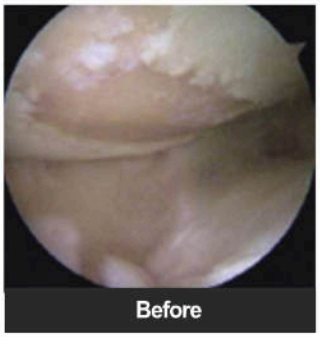
- Transfer the collected Autologous tissue to a transplant syringe.
- Inject into the treat-ment area via trocar or arthroscope.

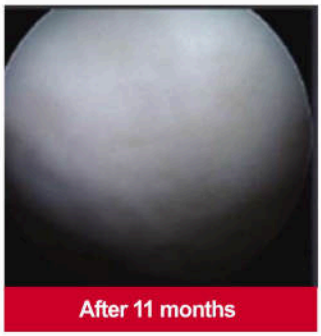
| Used with BMSC



- Mix Autologous tissue separated from the collected and Bone Marrow Stem Cell(BMSC) concentrated separately by using two-way mixing tubes.
- Inject into the treatment area through the arthroscope.

Treatment cases









Certification and Patent Status

FDA 식품의약품안전처 보건복지부 KFDA CE GMP ISO ISO

21 technology patent applications in Korea
3 international patents (PCT) with 15 countries designated & EU



Disposable Kits Information

BSC (Blood stem cell steriled disposable kits)

BSC+③ 30	Blood Stem Cell Separate and Concentrate Kit	Provides 3.5ml from 30ml of whole blood	6EA / 1BOX
BSC+③ 60	Blood Stem Cell Separate and Concentrate Kit	Provides 10ml from 60ml of whole blood	3EA / 1BOX
BSC+③ 120	Blood Stem Cell Separate and Concentrate Kit	Provides 20ml from 120ml of whole blood	2EA / 1BOX
BSC+③ 240	Blood Stem Cell Separate and Concentrate Kit	Provides 40ml from 240ml of whole blood	1EA / 1BOX


BSC+③ 30


BSC+③ 60


BSC+③ 120


BSC+③ 240

BMSC (Bone Marrow stem cell steriled disposable kits)

BMSC+③ 30	Bone Marrow Cell Separate and Concentrate Kit	Provides 3.5ml from 30ml of whole blood	1EA / 1BOX
BMSC+③ 60	Bone Marrow Cell Separate and Concentrate Kit	Provides 10ml from 60ml of whole blood	1EA / 1BOX
BMSC+③ 120	Bone Marrow Cell Separate and Concentrate Kit	Provides 20ml from 120ml of whole blood	1EA / 1BOX
BMSC+③ 240	Bone Marrow Cell Separate and Concentrate Kit	Provides 40ml from 240ml of whole blood	1EA / 1BOX


BMSC+③ 30


BMSC+③ 60


BMSC+③ 120


BMSC+③ 240