



How to Apply Exosomes?

After the production process,
exosomes are prepared as
ready-to-use final products.

Depending on the
indications, the
method of application
(such as
intra-articular or
intravenous) and
the frequency of
use may vary,
as determined by
the physician.



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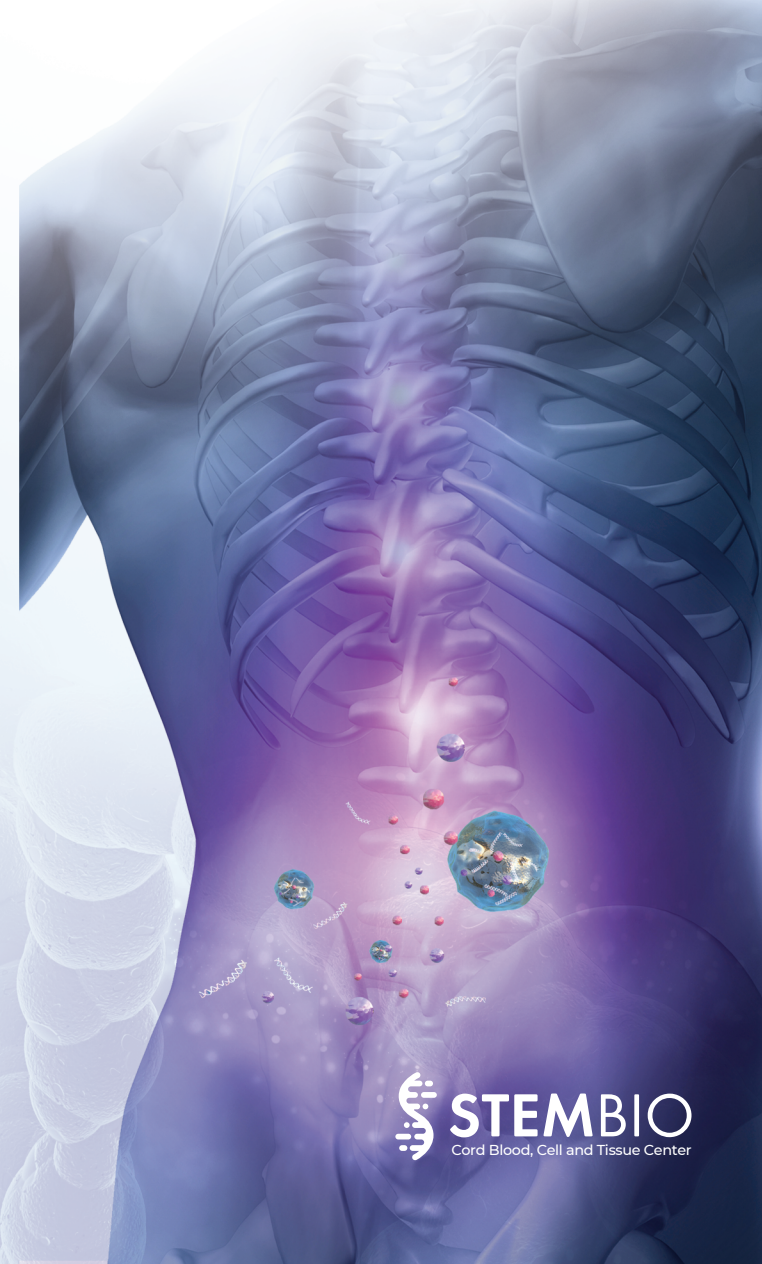


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ExCell

MSC DERIVED EXOSOMES



ExCell

MSC DERIVED EXOSOMES

ORTHOPEDICS



Mesenchymal Stem Cell Derived EXOSOME

What Are Exosomes?

Exosomes are lipid vesicles rich in proteins, isolated from the culture medium of cells through specialized processes. They have the capacity to regulate cellular and biochemical events that play a role in cell regeneration, immune system modulation, and the preservation of neurological functions, as they contain numerous growth factors.

The injectable **ExoCell exosome suspension**, derived from Wharton's jelly mesenchymal stem cells of umbilical cord origin, is designed for use in conditions such as osteoarthritis, bone fractures, meniscus injuries, bone damage, osteonecrosis, tendon injuries, and spinal cord injuries.

The use of mesenchymal stem cell-derived exosomes demonstrates potential for:

- Repairing damaged tissues
- Reducing inflammation
- Promoting the formation of new tissues
- Accelerating healing processes

Key Functions:

- Stimulates cell proliferation and migration
- Enhances angiogenesis
- Modulates the immune system, inflammation, and immune response
- Supports the repair of bones, cartilage, and soft tissues

What Are the Potential Applications of ExoCell Exosomes?

Exosomes, by targeting the repair of bones, cartilage, and soft tissues, immune system regulation, and cell regeneration, are used in the fields of orthopedics and traumatology for:

- Osteoarthritis Treatment
- Bone and Skeletal System Disorders Treatment
- Bone Fracture Healing
- Osteonecrosis Treatment
- Cartilage and Meniscus Injury Treatment
- Spinal Cord Injury Treatment

The therapeutic efficacy of exosomes is significantly influenced by the growth factors and cytokines they contain. These components contribute to immunomodulatory, osteoprotective, and chondroprotective effects.

How Are Exosomes Produced?

Exosomes are obtained from the Wharton's jelly of umbilical cords from newborns, which are accepted into StemBio Laboratories after passing all quality control processes in compliance with cGMP standards.

Mesenchymal stem cells isolated from the tissue are expanded in specialized culture flasks with cell-specific growth media. Dead cell debris is removed from the culture medium during the process. After pre-processing steps, the exosomes are isolated through ultracentrifugation at high speeds. The isolated exosomes undergo quality control tests and are then prepared as a ready-to-use product, stored under appropriate conditions to maintain their stability.



GROWTH FACTORS AND THEIR EFFECTS in ExoCell

Growth Factor (pg/ml)	Effect
BMP4 (Bone morphogenetic protein-4)	Bone and cartilage development, fracture repair, and muscle development
BMP5 (Bone morphogenetic protein-5)	Stimulation of bone growth
BMP7 (Bone morphogenetic protein-7)	A potent tumor suppressor gene
EGF (Epidermal growth factor)	Cellular proliferation, differentiation, and survival
EGFR (Epidermal growth factor receptor)	Differentiation of fibroblasts into myofibroblasts
EG-VEGF (Endocrine gland-derived VEGF)	Stimulation of angiogenesis and cell proliferation
FGF4 (Fibroblast growth factor-4)	Bone morphogenesis, limb development, cell growth, and tissue repair
FGF7 (Fibroblast growth factor-7)	Re-epithelialization during wound healing
GDF15 (Growth differentiation factor -15)	Regulation of inflammation, apoptosis, cell repair, and growth
IGF1 (Insulin-like growth factor 1)	Growth-promoting effect on cells
IGFBP2 (IGF binding protein-2)	One of the six IGF-binding proteins that bind IGF-1 and IGF-2
IGFBP3 (IGF binding protein-3)	One of the IGF-binding proteins
IGFBP6 (IGF binding protein-6)	One of the IGF-binding proteins
MCSF (Macrophage colony-stimulating factor)	Proliferation, differentiation, and survival of monocytes, macrophages, and bone marrow progenitor cells
TGFB1 (Transforming growth factor beta 1)	Stem cell differentiation, T-cell regulation, and differentiation
HB-EGF ELISA Kit (Heparin-binding EGF-like growth factor)	Cardiac development and wound healing
IGFBP1 ELISA Kit (IGF binding protein-1)	Growth factor binding
IGFBP4 ELISA Kit (IGF binding protein-4)	Anti-tumorigenic effect
OPG ELISA Kit (Osteoprotegerin)	Stimulation of bone growth and inhibition of osteoclast precursor formation
PDGF-AA ELISA Kit (Platelet-Derived Growth Factor)	Promotion of healing in soft and hard tissues
SCF/MGF ELISA Kit (Stem Cell Factor)	Growth of stem cells and melanocytes
SCFR/CD117/C-kit ELISA Kit Stem Cell Factor Receptor	Cell survival, proliferation, and differentiation
TGF-α ELISA Kit (Transforming growth factor alpha)	Cell migration, growth, and differentiation
TGF-β3 ELISA kit (Transforming growth factor beta 3)	A key anti-inflammatory protein; converts inflammatory T-cells into anti-inflammatory regulatory T-cells
VEGF ELISA Kit (Vascular endothelial growth factor)	Formation of new blood vessels
VEGFR-2/Fik-1 ELISA Kit (Vascular endothelial growth factor receptor 2)	Mediates mitogenic activity and proliferation in endothelial cells
VEGFR-3/Fit-4 ELISA Kit (Vascular endothelial growth factor receptor 3)	Facilitates mitogenic activity and proliferation in endothelial cells

This table provides an overview of the significant growth factors involved in biological and therapeutic processes, highlighting their diverse roles in tissue repair, regeneration, and modulation of cellular activities.