Aurora Exo Series Ortho

Targeted Biotherapy in Regenerative Orthopedics: Lyophilized, Osteogenic and Chondrogenic Differentiated Cell-Derived Exosomes

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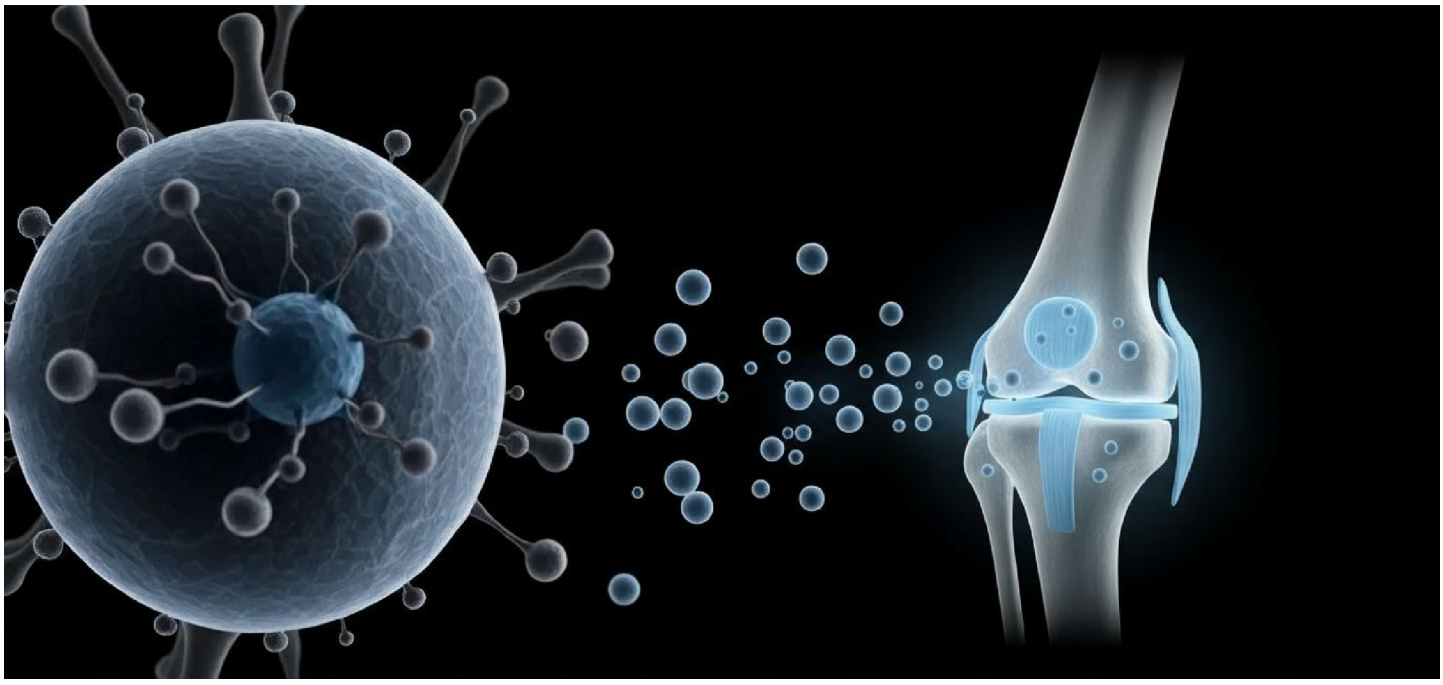
Introduction

In musculoskeletal system regeneration, extracellular vesicles and especially exosomes (30-150 nm) are at the center of the "cell-free therapy" paradigm. It has been shown that the effects of mesenchymal stem cells on bone and cartilage repair are largely mediated through paracrine secretions, especially exosomes[1]. These nanovesicles manage the repair programs of target cells with the specific microRNAs and growth factors they carry.



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Aurora Exo Series Ortho® Advantages

Aurora Exo Series Ortho® offers significant advantages in clinical use with its lyophilized form:

Critical Advantages of Lyophilization

1

Superior Thermal Stability Eliminates the requirement for -80°C deep freezing. With a long shelf life at +4°C, it greatly facilitates product logistics and storage .

2

Preservation of Bioactivity The optimized critical drying process preserves therapeutic efficacy by maintaining vesicle integrity and the activity of biological content (e.g., osteogenic miRNA-29a, chondrogenic miRNA-140) .

3

Practicality in Clinical Use Aurora Exo Series Ortho® comes with the activator inside the box. When combined with the activator liquid, it is suitable for ready use in the operating room or clinic environment.

4

Precise and Standardized Dose Each 5 ml vial contains exactly 5 billion exosome particles, providing a reliable basis for clinical studies.

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A Special Approach: Aurora Exo Series Ortho®

Compared to general MSC exosomes, directing the source cell to specific tissues relies on enriching the exosome cargo. This is a "content engineering" strategy. Exo Ortho product for orthopedic applications by converting MSCs obtained from cord tissue into osteogenic or chondrogenic precursors.

Osteogenic Exosomes: These exosomes naturally carry enriched bone morphogenetic protein (BMP) signaling pathway components, proteins such as osteocalcin, osteopontin, and microRNAs that regulate bone formation such as miR-29a, miR-148a .

Chondrogenic Exosomes: These exosomes contain increased levels of factors supporting collagen type II and aggrecan synthesis, SOX9 transcription factor, and cartilage-specific miR-140, while also inhibiting inflammatory signals such as IL-1β .

Enhanced Targeting Potential: The source cell phenotype can affect adhesion molecules on the exosome membrane, enabling these nanovesicles to have a better binding and targeting (tropism) capacity to the damaged bone or cartilage matrix .

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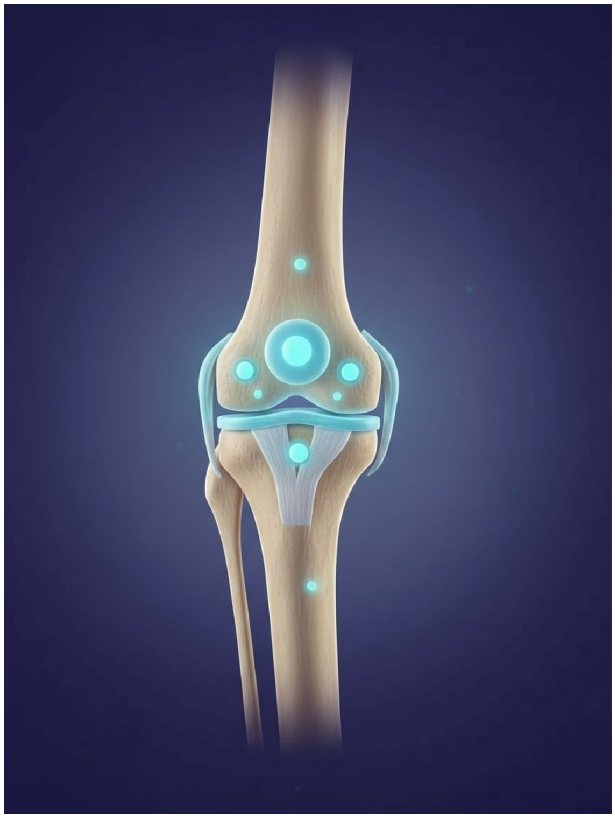
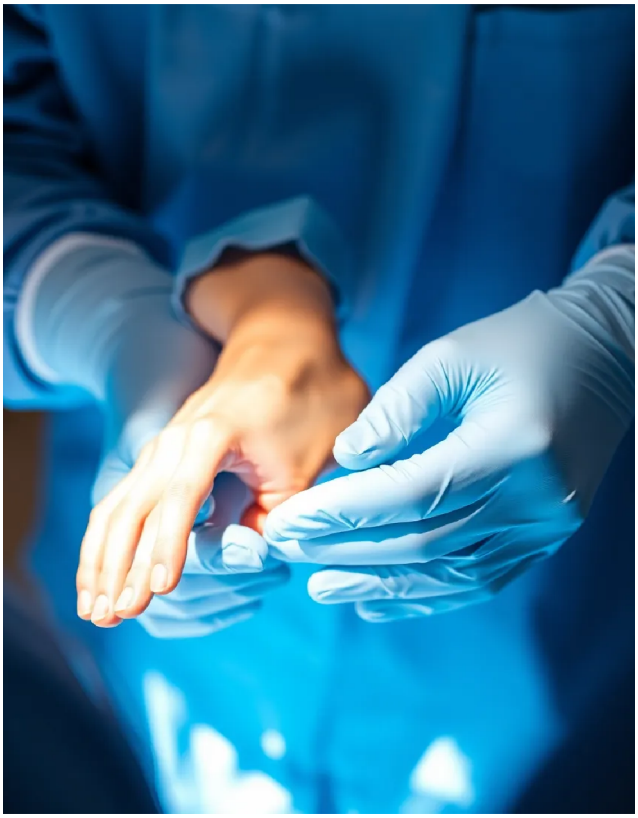
Clinical and Surgical Application Scenarios

Osteoarthritis: As an intra-articular injection, for symptomatic and structural modifying treatment purposes.
Critical Bone Defects: Local application by mixing with bone graft or synthetic scaffolds.
Osteochondral Lesions: Synchronizing both cartilage and subchondral bone repair.
Spinal Fusion and Arthrodesis: By adding to the graft material to optimize fusion success and duration.
Meniscus and Labrum Injuries: Minimally invasive injections to support tissue repair.





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