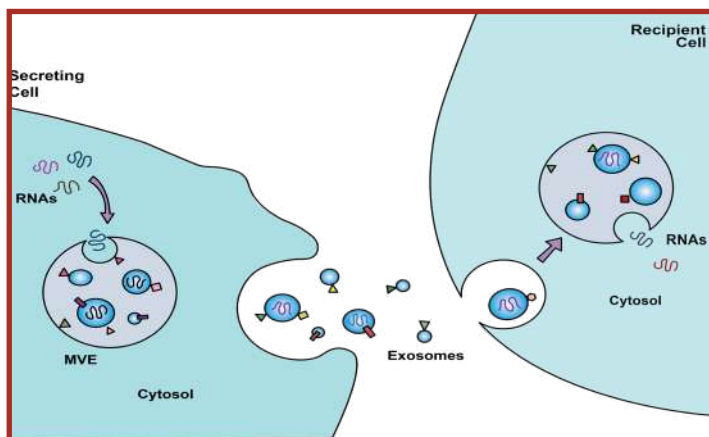


EXOSOMES

Therapeutics Prospects on General Wellness



EXOSOMES

Exosomes are the vesicles secreted from any cells, especially stem cells, containing various bioactive components



EXOSOME THERAPY

- Exosomes are how the cells communicate with each others. They carry various bioactive components and transfer to another cells in order to send certain signals for the cell to action.
- Exosomes can be isolated and apply to the patient's body for treatment by:

Nebulizer

Injection

Intravenous (IV)
diffusion

- **EXAMPLE:** Intra-articular Injection of exosome solution can be applied to relieve the pain and help in cartilage regeneration for a long-term treatment effect.



HALLMARKS OF EXOSOMES

Waste Management

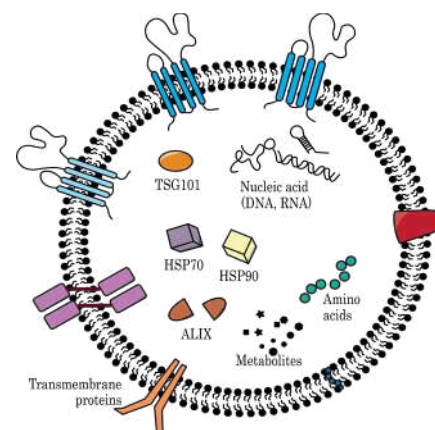
Reproduction &
Development

Modulate Immune
System

Regulate Metabolism

Angiogenesis & Wound
Healing

Promote Cell Survival
& Proliferation



THERAPEUTIC PROSPECTS OF EXOSOMES

Exosomes are widely studied in many fields and proven to help in the recovery of many diseases. In the use for general wellness, exosomes are also an additional treatment to regulate the body function.



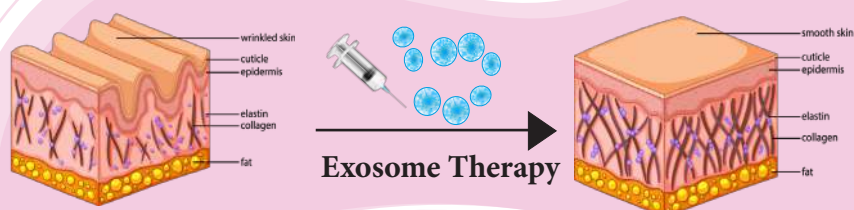
The MAIN CAUSES of Skin Aging:

- 1 Natural Aging Process
- 2 UV Radiation by Sun (Photo-aging)
- 3 Environmental Factor

A. SKIN REJUVENATION AND ANTI-AGING/ PHOTOAGING

Exosomes can significantly restore aging-skin and reduce skin wrinkles.

- **Keep skin hydrated** & reduce water loss from skin
- **Enhance skin elasticity** by promoting collagen synthesis
- **Promote skin rejuvenation** by secreting growth factors to regenerate degenerated skin tissues.

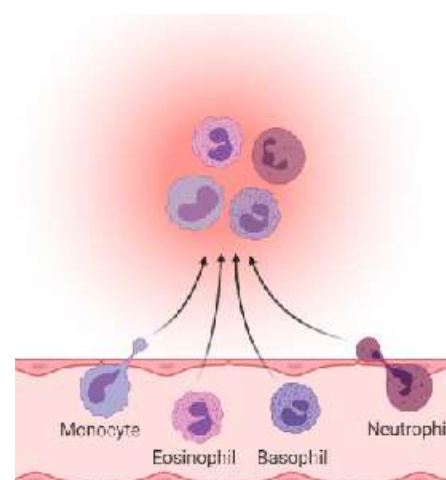


B. EXOSOME THERAPY PROMOTES HEALING PROCESS

Exosomes can secrete various molecules at the injury site, for example growth factors and miRNA to promote tissue regeneration and fasten the wound healing process.

1 At the beginning of the healing process, exosomes promote the process of removing dead and injured cells from the injury site.

2 Later, exosomes secrete components to facilitate tissue regeneration, restore cell function and increase nutrient supply that are necessary to repair and regenerate new tissues.



Tissue injury can be caused by the occurring of inflammation due to the diseases or mechanical injuries

C. EXOSOME THERAPY CAN REDUCE THE RISKS OF CARDIOVASCULAR DISEASES



Exosomes contains a group of HSP proteins that can have the cardioprotective effect to our bodies' cardiovascular system

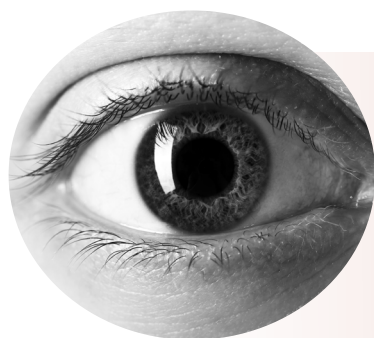
- 1** Helps in cell-to-cell communication to promote cell survival
- 2** Promotes the formation of blood vessels
- 3** Protect heart tissues from cell damage



Exercises can promote exosome secretion from our own bodies which possess the cardioprotective effect to the heart



For *patients who cannot exercise*, the injection of exosomes from young people right after exercise can further improve the patient's heart function.



D. EXOSOME THERAPY AS A TREATMENT FOR DRY EYE DISEASE (DED)

DED happens when decreased of tear secretion or increased tear evaporation.

The MAIN CAUSES OF DED:

- 1** Aging
- 2** Autoimmune Diseases

Patients with exosome treatment greatly showed reduced symptoms with improved dry eye scores.

- 1** Exosomes improve the tear volume & tear stability
- 2** It improves the corneal healing
- 3** It also decreases the inflammation that causes DED

**This is a poster for educational purposes only

REFERENCES: 1. Li, Y., Han, C., Wang, J., Zhou, J., Liang, C., Ranganna, K., & Song, Y. H. (2017). Exosomes mediate the beneficial effects of exercise. *Exercise for Cardiovascular Disease Prevention and Treatment*, 333-353. (2) Lai, R. C., Yeo, R. W. Y., & Lim, S. K. (2015, April). Mesenchymal stem cell exosomes. In *Seminars in cell & developmental biology* (Vol. 40, pp. 82-88). Academic Press. (3) Toh, W. S., Zhang, B. I. N., Lai, R. C., & Lim, S. K. (2018). Immune regulatory targets of mesenchymal stromal cell exosomes/small extracellular vesicles in tissue regeneration. *Cytotherapy*, 20(12), 1419-1426. (4) Villatoro, A. J., Fernández, V., Claros, S., Alcoholado, C., Cifuentes, M., Merayo-Llodes, J., ... & Becerra, J. (2017). Regenerative therapies in dry eye disease: from growth factors to cell therapy. *International journal of molecular sciences*, 18(11), 2264.

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