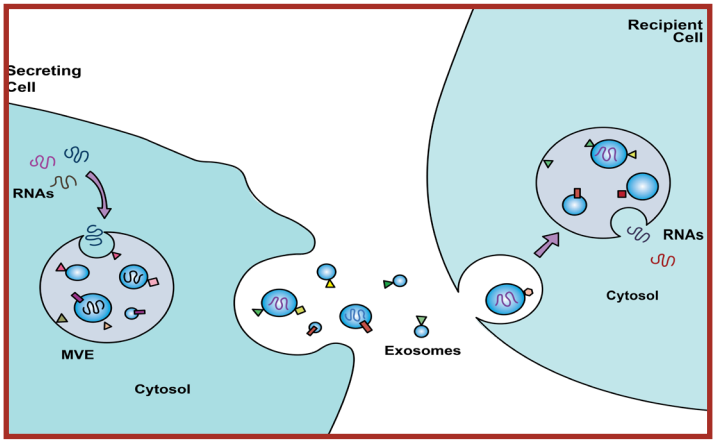
EXOSOMES

Therapeutics Prospects on General Wellness



EXOSOMES

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

EXOSOME THERAPY

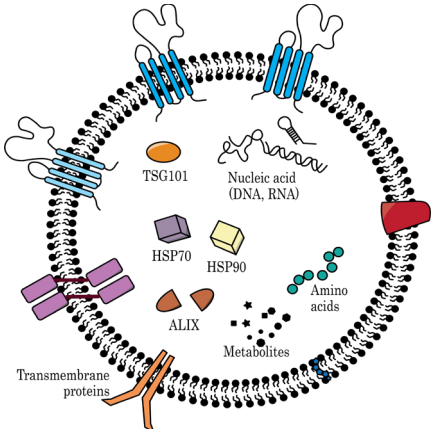
- Exosomes are how the cells communicate with each others. They carry various bioactive components and transfer to another cells in order to send certain signals for the cell to action.
- Exosomes can be isolated and apply to the patient's body for treatment by:

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.

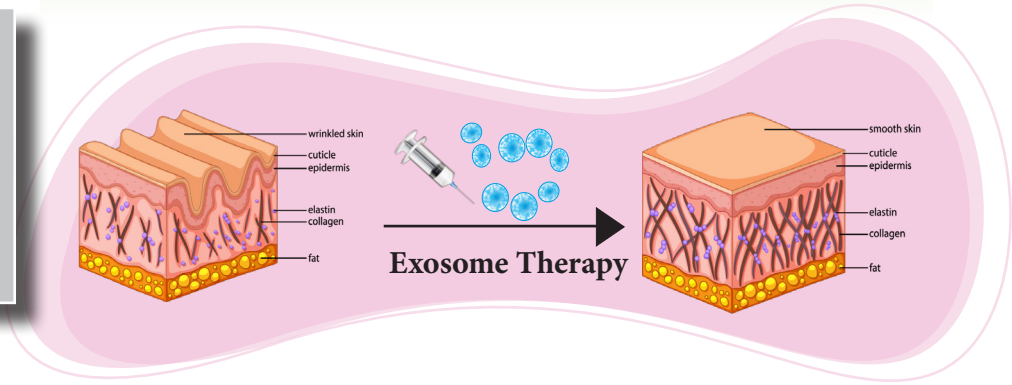
A. SKIN REJUVENATION AND ANTI-AGING/ PHOTOAGING

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.

The **MAIN CAUSES** of Skin Aging:

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

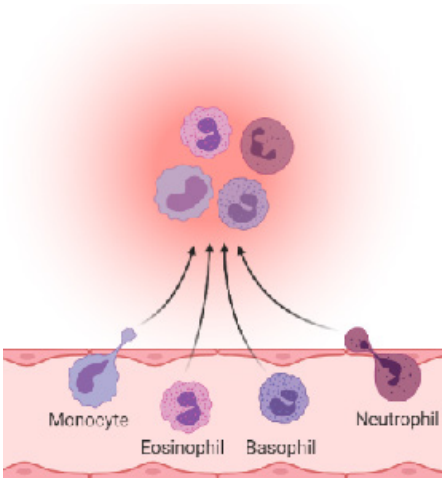


B. EXOSOME THERAPY PROMOTES HEALING PROCESS

Exosomes can secretes 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 occuring 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)

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

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

The **MAIN CAUSES** OF DED:

1. Aging
2. Autoimmune Diseases

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-Lloves, 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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