Mesenchymal Stem Cell-derived Exosomes (MSC-Exos)& Their THERAPEUTICS EFFECTS on Covid-19

Exosomes that contain various bioactive molecules hold a huge potential in the covid-19 treatment by their immunomodulatory, anti-inflammatory and regenerative properties.

1 WHAT IS MSC-Exo?

A small membrane-bound vesicle secreted from mesenchymal cell that carry the various bioactive molecules such as nucleic acid, lipids and proteins to modulate the fate of recipient cells.

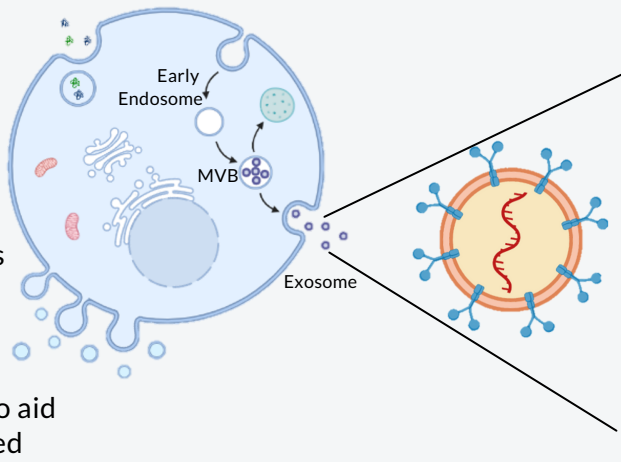
Mesenchymal Stem Cell

UNSPECIALIZED

Cell that has the ability to develop into different types of cells

REGENERATION

Stem cells can regenerate to aid into replacement of damaged cells



Exosome

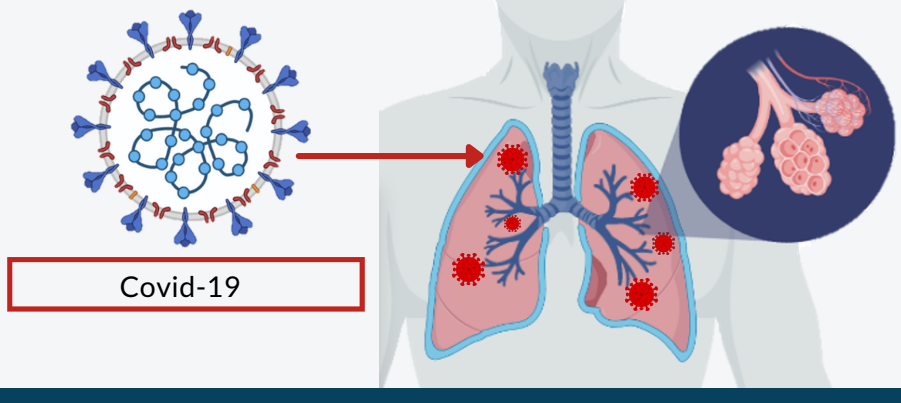
SMALL(30-150 NM)

They can pass through small blood capillaries

FASTER EFFECT

Exosomes separated from MSC react more directly to the recipient cells.

2 WHAT COVID-19 CAUSES?



Covid-19

ALI/ADRS

Small air sacs (alveoli) in your lungs are built up with fluid

↓

Your lungs are kept from filling up with enough oxygen, cause severe shortness of breath

↓

Causes damage to your lungs and life is threatening

Covid-19 induces **excessive and unusual host immune responses**, together with overproduction of cytokines (a group of signaling molecules for immune system)

→

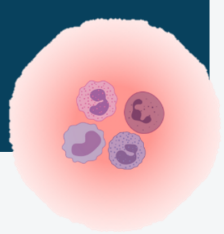
By targeting lung tissue, these cytokines induce pulmonary edema and subsequent **acute lung injury (ALI)** or **acute respiratory distress syndrome (ARDS)**

3 POTENTIAL THERAPEUTICS EFFECTS of MSC-Exos ON COVID-19

Anti-inflammatory & Homing property

MSC-Exos possess distinctive and intrinsic homing property, to move it toward inflammation site in the body

For ALI/ADRS
- reduces inflammatory reactions & promotes edema clearance
- protects lung tissues from becoming damaged and scarred by ALI/ARDS



Immunomodulatory effect

Exosomes that carry essential growth factors and biological signals can help to 'reprogram' the immune response

- decrease the destructive inflammatory components
- maintain the host response to infections
- enhance the repair and resolution of lung injury

Multi-target

MSC-Exos are multi-targeted biological agents, which can reduce the overproduction of cytokine

They are capable of activating other resident cells to be utilized in the healing process such as tissue repair and cell survival

REFERENCES

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