14th International Conference on
Pharmaceutical Education and Practice

October 28th, 2022 | Webinar

ISSN: 2952-8100

Mesenchymal Stem Cell Derived-Exosomes as a Novel Nano Podium for Drug Delivery to Treat COVID-19

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COVID-19 has proved fatal to countless people with a compromised immune system. Similar to the principle mechanisms in treating autoimmune diseases, Stem cell therapy aims to reset and strengthen the compromised immune systems and thereby reduce the high mortality rate among severe COVID-19 patients. Mesenchymal stem cells (MSCs) are the most scientifically studied cells in regenerative medicine, owing to their immunomodulatory and differentiation potential. However, several complications come with their translational application like viability, duration, and degree of expansion, long-term storage, and high maintenance cost. Therefore, drawbacks of cell-based therapy can be overcome by a novel therapeutic modality emerging in translational research and application, i.e., exosomes. Application of MSC derived exosomes has been presented in drug delivery, which has made these Nano-vesicles an attractive clinical tool. The vast advantages of using exosomes over MSCs have shifted the focus on these Nano-platforms. The MSCs derived exosomes can be a novel intervention for treating the current COVID-19 pandemic situation due to their regenerative, immunomodulatory, and antimicrobial properties. With upcoming reports and clinical studies using these proposed novel therapeutic interventions, exosomes can be established as cell-free therapeutics and drug delivery modality worldwide. This is the need of the hour and must be looked into as a potential Nano-intervention for treating critically ill patients. This paper displays such a diverse range of advantageous properties including their spectral curability, and their capability to be used as a drug carrier, make exosomes an ideal candidate for clinical applications, and as an off the shelf therapeutics.

Biography

Laila M. Montaser MD is a distinguished Prof. of Clinical Pathology. She served as the Chair Emeritus, Founder leader of Clinical Pathology Department, Faculty of Medicine, Menoufia University, Egypt. Montaser is an internationally recognized stem cell technology professional. She has key competence in stem cell technology and regenerative medicine policy reinforced by global level and international experience in research, formulation and capacity building. In the era of COVID-19, she was awarded twenty one certificates of appreciation for successfully presenting thirty seven Global Webinars 21/37 (56.8%) from her home office amid the lock-down of COVID-19 crisis.

Received: June 24, 2022; **Accepted:** June 26, 2022; **Published:** October 29, 2022