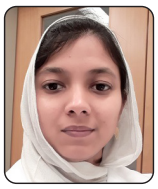
Asian Journal of Pharmaceutical Technology and Innovation

Abstract



Nanovesicle (Mis)Communication in Senescence-Related Pathologies

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Abstract:

Extracellular vesicles are a heterogeneous group of cell-derived membranous structures comprising of exosomes, apoptotic bodies, and microvesicles. Of the extracellular vesicles, exosomes are the most widely sorted and extensively explored for their contents and function. The size of the nanovesicular structures (exosomes) range from 30 to 140 nm and are present in various biological fluids such as saliva, plasma, urine etc. These cargo-laden extracellular vesicles arise from endosome-derived multivesicular bodies and are known to carry proteins and nucleic acids. Exosomes are involved in multiple physiological and pathological processes, including cellular senescence. Exosomes mediate signaling crosstalk and play a critical role in cell–cell communications. Exosomes have evolved as potential biomarkers for aging-related diseases. Aging, a physiological process, involves a progressive decline of function of organs with a loss of homeostasis and increasing probability of illness and death. The age-associated changes in exosomes and their composition have detrimental effects leading to the development of various pathologies. Owing to their ability to transport biological information among cells, the interplay of senescent cell-derived exosomes with other cells accelerate the aging process, including the susceptibility of the aging population to COVID-19 infections. The varied nature of the molecules packaged and delivered by exosomes makes it a valuable biomarker for identifying and tracking disease progression and aging. Understanding the relation of aging process to age-related diseases is of great clinical importance for the development of novel therapeutic strategies. The crosstalk of exosomes from the senescent cells with the neighboring cells and its microenvironment has not been well understood. From the studies, it is clear that senescent cell-derived exosomes might be a potential target for age-related therapies and can be achieved by modulating their cargo, mainly miRNAs. Compared to other conventional treatments, the fact that exosomes are small, potent, and non-living makes them highly attractive bioactive molecules. Furthermore, exosomes have the additional advantage that these nanovesicles do not invoke an immune response and also could be used to develop personalized medicines.

Biography:

Sherin Saheera completed her PhD from Sree Chitra Tirunal Institute for Medical Sciences and Technology, Kerala, India in 2017 and went to USA to pursue her postdoctoral stuides. After 1 year of postdoc at the University of Alabama, she is currenty working as a Postdoctoral Associate at Univeristy of Massachusetts Medical School, USA since 2019 January. She has over 15 publications in peer reviewed high-impact international journals and has been serving as an editorial board member and reviewer for reputed Journals. She presented papers in several national and international conferences and has got many aclodes.

Publication of speakers:

1. Nano-Vesicle (Mis)Communication in Senescence-Related Pathologies
2. Involvement of Histamine 2 Receptor in Alpha 1 Adrenoceptor Mediated Cardiac Hypertrophy and Oxidative Stress in H9c2 Cardio Myoblasts
3. Histone deacetylases 1 and 2 silence cryptic transcription to promote mitochondrial function during cardiogenesis
4. Cardiovascular Changes Associated with Hypertensive Heart Disease and Aging
5. Protective effect of antioxidant Tempol on cardiac stem cells in chronic pressure overload hypertrophy

2nd Webinar on Nanotechnology and Nanomedicine, September 24, 2020, London, UK

Citation: Sherin Saheera; Nanovesicle (Mis)Communication in Senescence-Related Pathologies, USA; Nanomedicine 2020; September 24, 2020; London, UK.