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Ageing and Age-Related Diseases and Therapeutic Potential of Extracellular Vesicles

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INTRODUCTION

Changes in cell-to-cell communication are related to ageing. These alterations in the extracellular environment, which have been linked to a number of disorders associated with ageing, worsen the maturing aggregation. Extracellular vesicles (EVs) have a role in the mediation of signalling chemical transmission between cells. These EVs have been shown to control significant ageing processes like oxidative stress and senescence.

Numerous studies employing diverse animal models have shown promising results in the field of regenerative medicine. It has been proposed that EVs from healthy cells, in particular stem cells (SCs), may affect the stem cells' capacity for regeneration (SCs). EVs are being investigated as a potential cell-free therapy for a variety of illnesses and tissue damage. Here, we suggest that EVs could be employed to cure disorders associated with ageing, control.

The most often utilized approach in regenerative medicine is stem cell treatment. Exogenous stem cells should be able to repair a range of damaged tissues due to their capacity for self-renewal. Mesenchymal undifferentiated organisms (MSCs) are the type of cell type that have been the subject of the most investigation for clinical applications due to their low immunogenicity and simplicity in culture and separation.

DESCRIPTION

Despite these facts, MSC-based therapies have been demonstrated to be helpful for a variety of illnesses and to accelerate tissue regeneration, suggesting that paracrine processes are responsible for these cells' most important effects. As a result, MSCs' secretome has been touted as a potential therapeutic for tissue regeneration and repair.

Extracellular Vesicles (EVs) have come to be recognized as a highly intriguing alternative among all the substances that stem cells release to the extracellular environment, both *in vivo* and *in vitro*. The interchange of proteins, nucleic acids, or lipids between cells is assumed to occur in these lipid bilayer vesicles, which are released by practically all types of cells. These lipid bilayer vesicles contain a variety of chemicals. Exosomes, microvesicles, ectosomes, oncosomes, and apoptotic bodies are only a few examples of the various EV types. These are arranged according to their biological purpose and source.

When it comes to accelerating tissue regeneration, using EVs instead of stem cells has a lot of benefits. EVs are less likely to trigger immunological rejection, have a simpler dosage, don't pose the risk of aneuploidy, and are more stable. In a range of tissues, including the kidney, liver, heart, and brain where induced damage has occurred, EVs produced from several types of stem cells have shown their ability to accelerate tissue regeneration [1-4].

CONCLUSION

Aging is the most important element in the development of many diseases that afflict us, and these diseases are the primary cause of disability and mortality in practically every country. One of the most exciting areas of medical study is the application of cellular and molecularly targeted anti-aging treatments. To cure disorders associated with ageing, we will likely need to focus on a number of these mechanisms. As we have shown in this study, EVs are promoted as a cell-free therapy that has produced notable results in preclinical models of numerous age-related illnesses and tissue regeneration. EVs from various sources, notably those generated by stem cells, have been demonstrated to influence a wide range of cellular processes because of their pro-regenerative and immunomodulatory capabilities.

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DECLARATION OF CONFLICTING INTERESTS

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