

Exosomes for repair, regeneration and rejuvenation

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Abstract

INTRODUCTION:

Application of regenerative medicine strategies for repair of organs/tissue impacted by chronic disease is an active subject for product development. Such methodologies emphasize the role of stem cells as the active biological ingredient. However, recent developments in elucidating mechanisms of action of these therapies have focused on the role of paracrine, 'action-at-a-distance' modus operandi in mediating the ability to catalyze regenerative outcomes without significant site-specific engraftment. A salient component of this secreted regenerative milieu are exosomes: 40-100 nm intraluminal vesicles that mediate transfer of proteins and nucleic acids across cellular boundaries.

AREAS COVERED:

Here, we synthesize recent studies from PubMed and Google Scholar highlighting how cell-based therapeutics and cosmeceutics are transitioning towards the secretome generally and exosomes specifically as a principal modulator of regenerative outcomes.

EXPERT OPINION:

Exosomes contribute to organ development and mediate regenerative outcomes in injury and disease that recapitulate observed bioactivity of stem cell populations. Encapsulation of the active biological ingredients of regeneration within non-living exosome carriers may offer process, manufacturing and regulatory advantages over stem cell-based therapies.

KEYWORDS:

Exosome; cell therapy; extra-cellular vesicle; manufacturing; micro-vesicle; morphogen; organogenesis; progenitor cell; quality control; regenerative medicine; regulatory; stem cell; tissue engineering

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