Journal of Material Sciences & Engineering
ISSN 2169-0022
2020
Vol.09 No.6

CD9 ENHANCES THE THERAPEUTIC EFFECT OF EXOSOMES IN AGING MODEL OF MICE AND STEM CELLS PROLEFERATION

Mujib Ullah
Stanford University, USA

Abstract

Statement of the Problem: CD9 is a protein that drives growth of stem cells, and which could be a target for new treatments, has been identified by researchers at the Stanford University. The researchers altered the amount of CD9 in stem cells and their-derived exosomes in mice and found that increasing levels of CD9 made stem cells more proliferative and enhanced the therapeutic index of exosomes drug delivery .Exosomes are extracellular vesicles that carry a cargo of therapeutic proteins, which have shown promising potential in regenerative medicine applications. It has previously been demonstrated that CD9 can enhance the therapeutic effect of stem cell therapies. However, the effect of CD9 on exosome therapy remains largely unexplored. In the present study, we analyzed the effect of exosome therapy, combined with CD9 expression. CD9 overexpressed exosomes significantly improved the repair process of damages tissues. This protective effect was mediated by a reduction in inflammation, increased cell proliferation, and decreased apoptosis. We identified several pathways through which exosomes and CD9 synergistically exert their therapeutic effect, including upregulation of FoxO signaling. Thus, CD9 may be a promising strategy for enhancing the therapeutic efficacy of exosome treatment.

Conclusion & Significance: CD9 protein is both linked to stem cells proliferation and growth, this could guide the development of new treatments that are targeted at the protein. CD9 protein could therefore be used as a marker to identify stem cells proliferation rate.

Biography:

Dr. Mujib Ullah is a senior scientist at Stanford University, working at Interventional Regenerative Medicine and Imaging Laboratory, Department of Radiology, Stanford University, Palo Alto, California, 94304, USA

Speaker Publications:

Ullah, M., et al., *Stem cell-derived extracellular vesicles: role in oncogenic processes, bioengineering potential, and technical challenges.* Stem Cell Research & Therapy, 2019. **10**(1).

Ullah, M., D.D. Liu, and A.S. Thakor, *Mesenchymal Stromal Cell Homing: Mechanisms and Strategies for Improvement.* iScience, 2019. **15**: p. 421-438.

Ullah, M., A. Akbar, and A.S. Thakor, *An emerging role of CD9 in stemness and chemoresistance.* Oncotarget, 2019. **10**(40): p. 4000-4001.

Ullah, M., et al., *Mesenchymal stem cells confer chemoresistance in breast cancer via a CD9 dependent mechanism.* Oncotarget, 2019. **10**(37): p. 3435-3450.

Ullah, M., et al., *iPS-derived MSCs from an expandable bank to deliver a prodrug-converting enzyme that limits growth and metastases of human breast cancers.* Cell Death Discovery, 2017. **3**.