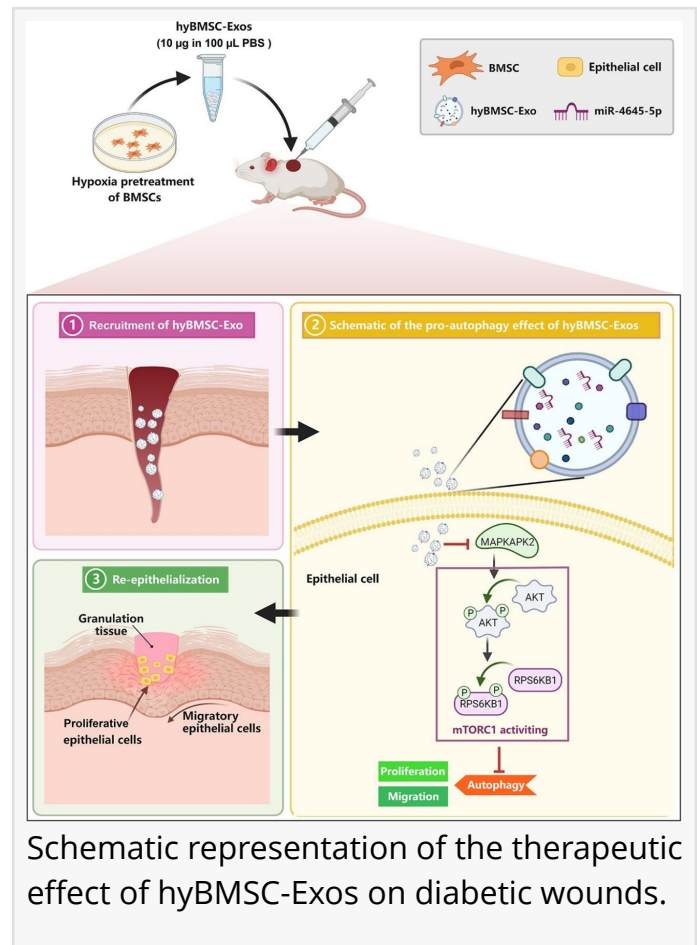


Healing Diabetes Wounds with a New Superhero: Stem Cell Magic

CHINA, February 20, 2024 /EINPresswire.com/ -- Researchers unveiled a novel therapy for diabetic wound healing. This research highlights the use of exosomal miR-4645-5p from hypoxic bone marrow mesenchymal stem cells ([BMSCs](#)) to significantly enhance wound healing by promoting keratinocyte autophagy.

Diabetic wounds, often challenging to treat and prone to complications, can severely impact patients' quality of life. Traditional treatments have struggled with issues like low survival rates of transplanted cells and potential for immune rejection. This research introduces a groundbreaking approach using stem cells' regenerative capabilities.

On a study (DOI: [10.1093/burnst/tkad058](https://doi.org/10.1093/burnst/tkad058)) published in the journal Burns & Trauma, researchers have pioneered a novel approach to heal diabetic wounds faster and more effectively than ever before. Their research centers on the use of special particles called exosomes, which are derived from stem cells grown under low oxygen conditions, known as hypoxic conditions. These exosomes contain a potent molecule, miR-4645-5p, that significantly boosts the healing process.



This study delves into the use of exosomes from hypoxic bone marrow mesenchymal stem cells (BMSCs) as a novel treatment for diabetic wounds, which are notoriously difficult to heal and prone to infections. Focusing on the microRNA miR-4645-5p, found within these exosomes, the research uncovers its critical role in enhancing wound healing by targeting the MAPKAPK2 pathway, thereby regulating the AKT-mTORC1 signaling cascade. This inhibition boosts autophagy in keratinocytes—key players in wound repair—by promoting cell health, proliferation, and migration. Demonstrating that exosomes enriched with miR-4645-5p from hypoxic BMSCs can significantly speed up the healing of diabetic wounds, the study paves the

way for new regenerative medicine strategies that manipulate cellular environments to enhance autophagy, offering a promising avenue to improve outcomes in diabetic wound care.

Dr. Yan Shi, the lead researcher, states, "Our findings offer a new horizon in diabetic wound care. By harnessing the power of stem cell-derived exosomes, particularly under hypoxic conditions, we've seen a remarkable improvement in wound healing processes, opening doors to potentially life-saving treatments."

This research not only sheds light on the mechanisms behind stem cell-mediated wound healing but also opens up new avenues for developing treatments for diabetic wounds and possibly other conditions. The ability to harness and modulate the healing properties of stem cells through their exosomes could lead to more effective, targeted therapies, reducing the burden of diabetic wounds on patients worldwide.

DOI

10.1093/burnst/tkad058

Original Source URL

<https://doi.org/10.1093/burnst/tkad058>

Funding information

This study was supported by the National Natural Science Foundation of China (No. 82060350, No. 82002272, No. 82272276), China Postdoctoral Science Foundation (No. 2022 M711335, No. 2021 M701434), Guangdong Basic and Applied Basic Research Foundation (No. 2022A1515110490, No. 2021A1515011453, No. 2022A1515011380, No. 2022A1515012160), Industry-university-research Innovation Fund of Higher Education of China (No. 2021JH028), the Science and Technology Innovation Committee of Shenzhen (No. JCYJ20220530152015036).

Lucy Wang

BioDesign Research

[email us here](#)

This press release can be viewed online at: <https://www.einpresswire.com/article/689943488>

EIN Presswire's priority is source transparency. We do not allow opaque clients, and our editors try to be careful about weeding out false and misleading content. As a user, if you see something we have missed, please do bring it to our attention. Your help is welcome. EIN Presswire, Everyone's Internet News Presswire™, tries to define some of the boundaries that are reasonable in today's world. Please see our Editorial Guidelines for more information.

© 1995-2024 Newsmatics Inc. All Right Reserved.