

Insulin based nanoformulations for wound its healing activity in diabetic conditions

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About 422 million people are suffering from diabetes worldwide making it 8th most fatal diseases (WHO, 2016). Estimated 15-25% of diabetic patients will develop foot ulcers and good 1-2% of that need amputation of a lower limb. In spite of insulin is the most common and effective therapeutic choices for treatment of Type-I diabetes little is known about insulin's wound healing capability. We have made different insulin based nanoformulations such as insulin encapsulated silver nanoparticles, insulin-loaded chitosan particles, insulin conjugated hydroxyapatite particles for treatment of skin, muscle and bone tissue wound (cut and burn) healing in diabetic conditions. We have found that insulin nanoformulations alter cellular inflammatory signaling by modulating cytokine secretion dynamics. We have also observed the induction of tissue remodeling by insulin based nanoformulations to accelerate diabetic wound healing. We found insulin wound recovery by activation of PI3K, Akt, mTOR dependent pathway. Insulin also promotes the formation of blood vesicles by activating VEGF pathway. As about 5% of the world population is diabetic, therefore these novel and effective formulations have huge potential for future clinical application in diabetic wound healing including soft tissue rupture, burn wound, bone fractured and radiation-induced wounds in near future.

from Cedars Sinai Medical Center, California, USA, Dr. Choudhury had joined as Assistant Professor and coordinator of M.Sc. Biochemistry in School of Chemistry and Biochemistry, Thapar Institute of Engineering and Technology (TIET), Patiala, PB, India. Dr. Choudhury has been awarded an Early Career Research Grant, from Department of Science and Technology, Ministry of human resources, Govt. of India, in 2016-17. Dr. Choudhury has published 20 research papers and 2 patents. Some of the awards Dr. Choudhury has received include Best Speaker Award- Jadavpur University-2010, Young Investigator Award ICONSAT 2012, Institute Performance award-2017, TIET, and a number of international travel grants. Dr. Choudhury is interested in nano-bio interactions, diabetic wound healing, bio-imaging, and drug delivery.

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Biography: Diptiman Choudhury has a Ph.D. from Department of Biotechnology, University of Calcutta, India. After finishing his post-doctoral research